Age-related differences in construal level theory: implications for product concept testing

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AGE-RELATED DIFFERENCES IN CONSTRUAL LEVEL THEORY:
IMPLICATIONS FOR PRODUCT CONCEPT TESTING

by

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A thesis submitted in partial fulfillment
of the requirements for the Doctor of
Philosophy degree in Business Administration (Marketing)
in the Graduate College of
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This thesis is dedicated to my wife, Myung Won Sur, who has been always there for me. Also, this thesis is dedicated to my children Jeeyoo, Jiho, and Siho with love.
ABSTRACT

This research seeks to advance our understanding about potential sources of error arising from key decisions when conducting new product concept tests. My particular focus is on research design decisions including respondent selection (younger vs. older), information type (attribute vs. benefit) and presentation format (verbal vs. visual) and how their decisions influence respondents’ evaluations of new product concepts during concept tests. Importantly, I draw on construal level theory (CLT) to demonstrate that decisions in these three areas influence respondents’ reactions to new product concepts in an interactive rather than independent manner.

A key implication is that design decisions in concept testing lead to acceptance and rejection of product concepts independent of the inherent characteristics of the concepts themselves. Therefore, this research identifies potential sources of error not yet identified in the marketing literature. Furthermore, I provide prescriptions for overcoming the identified limitations. For example, I draw on CLT to explain challenges older respondents face when evaluating “attribute only” concept statements. The findings in this research suggest that when product managers conduct “attribute only” product concept tests with older adults, they should consider the inclusion of design factors such as images and instructions that promote a more concrete processing style.
PUBLIC ABSTRACT

Developing accurate demand estimates for product ideas is one of the most challenging and important tasks in new product development (NPD) systems. New product concept testing is one of the most common methods for obtaining these estimates. The purpose of concept testing is to help product managers determine (1) whether new product ideas warrant further investments and (2) obtain customer insights that improve product ideas before expending additional development investments.

Previous research notes that concept testing procedures are too often based on ill-defined processes, unreliable information and unproven decision rules (Dahl and Moreau 2002). This is alarming given the billions of dollars U.S. businesses devote to developing and launching new products each year (Kocina 2017).

It is clear from past research that research design decisions have the potential to influence how concept testing respondents perceive and evaluate new product ideas (Crawford and Di Benedetto 2003). These decisions largely fall into two areas: (1) respondent selection-related (i.e., who should participate) and (2) stimulus-related (i.e., how should information be presented) (Finn 1985; Moore 1982). Past concept testing research predominantly focuses on how decisions in each of these two areas independently influence the validity of concept tests. In contrast, the present research will provide a more nuanced examination showing how these research design decisions interact to influence respondents’ information processing and evaluation of new product concepts.
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DEVELOPING ACCURATE DEMAND ESTIMATES FOR PRODUCT IDEAS IS ONE OF THE MOST CHALLENGING AND IMPORTANT TASKS IN NEW PRODUCT DEVELOPMENT (NPD) SYSTEMS. NEW PRODUCT CONCEPT TESTING IS ONE OF THE MOST COMMON METHODS FOR OBTAINING THESE ESTIMATES. IN THESE TESTS, POTENTIAL CUSTOMERS TYPICALLY EVALUATE BRIEF STATEMENTS DESCRIBING NEW PRODUCT IDEAS AND THEN INDICATE THEIR LIKELIHOOD OF PURCHASING A FULLY DEVELOPED VERSION. PURCHASE LIKELIHOOD ESTIMATES ARE A KEY ELEMENT IN MANAGERS’ DECISIONS TO EITHER REJECT NEW PRODUCT IDEAS OR COMMIT ADDITION RESOURCES TO THEIR DEVELOPMENT AND POTENTIAL LAUNCH (DOLAN 1993; MOORE 1982). SCHWARTZ (1987) DESCRIBES NEW PRODUCT CONCEPT TESTING AS “… A QUANTITATIVE MARKET RESEARCH TECHNIQUE USED TO EVALUATE A CONCEPT’S POTENTIAL AND TO DISCOVER WAYS OF IMPROVING IT” (P. 4).

It is clear from past research that research design decisions have the potential to influence how concept testing respondents perceive and evaluate new product ideas (Crawford and Di Benedetto 2003). These decisions largely fall into two areas: (1) respondent selection-related (i.e., who should participate) and (2) stimulus-related (i.e., how should information be presented) (Finn 1985; Moore 1982). Past concept testing research predominantly focuses on how decisions in each of these two areas independently influence the validity of concept tests. In contrast, the present research will provide a more nuanced examination showing how these research design decisions interact to influence respondents’ information processing and evaluation of new product concepts.

One of the earliest decisions made when designing concept tests involves whom to recruit as potential respondents in the research. Respondent selection is always an important consideration in concept testing. Commercial applied market researchers primarily focus on pragmatic considerations, such as whether prospective respondents are members of the target market and either have purchased or plan to purchase a product in the category. Although these are valid criteria for selecting respondents, they may be insufficient in many concept testing contexts. For example, Peng and Finn (2010) find that individuals respond more favorably to new product concepts if they score higher on traits, such as innovativeness, independence, and novelty seeking. Similarly, Hoffman, Kopalle, and Novak (2010) proposed and developed a measure for the “emergent nature” trait, which reflects consumers “capability to imagine or envision how concepts might be further developed.” They argue that concept testing researchers should seek out respondents who are better able to envision how abstract product ideas might develop into concrete and marketable products. There are numerous types of individual
characteristics that could be examined, but I do not believe any are more important to marketing practice and theory than age-related differences in information processing.

Age-related differences in product preferences and information processing abilities are increasingly important as the proportion of older consumers increases in developed economies around the world. Globally, the number of persons older than 60 and is expected to increase from 841 million in 2013 to more than 2 billion in 2050 (United Nations, Department of Economic and Social Affairs, Population Division 2013). For marketers, it is noteworthy that older consumers in developed countries are also living healthier and wealthier lives. A 60 year-old U.S. adult can expect another 19 years with good health and an active lifestyle. These changes are having a significant impact on markets for almost all product categories. For example, A.T. Kearney (2013) recently found that U.S. consumers over 50 years of age spent $87 billion on vehicle purchases compared to $70 billion spent by those under 50. The same study also found that over 80 percent of all U.S. financial assets are owned by consumers over 50 years-of-age. The increasing economic importance of older consumers has attracted considerable attention from both marketing practitioners and academic researchers. However, surprisingly little attention has been given to the implications these changing demographic and economic forces have for NPD processes and specifically for appropriate methods in conducting and interpreting concept test results.

A substantial literature in consumer research and psychology finds that “older” and “younger” people process information differently. For example, older adults are easier to persuade and deceive (Phillips and Sternthal 1977; Waddel 1975), they process information at a slower rate (Phillips and Sternthal 1977), and they remember less product-related information (Stephens 1982; Stephens and Warrens 1984; Ziethaml 1982). These findings strongly imply that
alternative formats for describing new product ideas might interact with age-related differences in older and younger respondents to confound concept test results and lead to erroneous management decisions. In essence, NPD managers may mistakenly invest in or drop new product ideas due to choices made in designing their concept tests rather than on the merits of the product concepts themselves.

In addition to respondent selection, product managers must decide how to present new product concepts. These concepts may or may not include product prototypes, photos or other tools for communicating the new product idea. A considerable amount of research has examined how the inclusion of image affects respondents’ comprehension levels and depth of processing. For example, previous research finds that visual representations, as opposed to verbal representations, enhance respondents’ positive attitude, which in turn increase purchase intention toward the product concepts (Tauber 1972). Although other research supports this finding (Holbrook and Moore 1981; Moore and Holbrook 1982; Reidenbach and Grimes 1984; Smead et al. 1981), Vriens et al. (2000) argue that while visual representations can improve the respondents’ understanding of the design attributes, verbal representations may better facilitate judgment when attributes are well understood. Additionally, Lees and Wright (2004) reported that respondents’ attitude and purchase intention toward product concepts showed only minor variations with different presentation formats (stripped vs. embellished vs. visual) of the concept test statement. These researchers also find that the ranking of the concepts showed no substantial changes across the different presentation formats (Lees and Wright 2004). These inconsistent findings make it difficult to draw definitive conclusions about differences in verbal and visual presentation formats.
Finally, the present research also examines how different types of product concept descriptions influence respondents’ preferences for the product concepts. Specifically, in the early stages of the NPD process, managers frequently conduct concept tests with new product ideas before knowing the final target markets for the potential new product. In these instances, respondents often examine new product descriptions consisting of only product attributes or performance characteristics. As a result, respondents must infer benefits they might receive from a product possessing the described attributes. This practice is obviously inconsistent with the well-accepted market axiom that customers purchase benefits rather than attributes. Nonetheless, explicitly stating product benefits at this stage can bias test results when different segments of consumers either perceive different benefits from attribute or differentially value those benefits.

Consider the dilemma facing early pioneers in the car navigation market. Including specific benefit information for a car navigation device might attract some consumers while being irrelevant for other consumers. For example, a salesperson might be attracted to the product concept because it decreases driving and time and facilitates their ability to make additional sales calls. In contrast, a consumer might devalue any time saving benefits, but purchase the device to alleviate their fear of becoming lost in unfamiliar areas. Thus, benefit information is potentially confounded with respondent selection when different segments value different benefits. For this reason, concept tests often include only attribute information and allow respondents to infer their own benefits.

The present research examines alternative options for describing new product ideas in product concept tests. There is a growing consumer research literature that examines differences in how product attribute and benefit information are processed and evaluated by different types of consumers in different types of situations. The current research applies these insights to
concept testing to determine their applicability in this new context. Previous academic research examines information processing differences across attributes and benefits, but, in practice, NPD researchers do not test “benefit only” concept statements. As previously noted, “attribute only” concept statements are useful early in the NPD process when potential benefits are not fully understood. Later in the NPD process, concept statements typically describe the attributes and the associated benefits these attributes provide. In this context, research respondents have an opportunity to select the attribute or benefit information that is most relevant to them. It is my understanding that marketing practitioners at this stage in the NPD process typically depict products with both attribute and benefit information, yet previous academic research has largely ignored this more natural format.

As previously stated, I believe decisions regarding respondent selection, different types of product concept information and presentation format influence respondents’ evaluation of product concepts. Importantly, decisions in these three areas may influence respondents’ reactions to new product concepts in an interactive rather than independent manner. In other words, different types of respondents will have a different understanding and response to product concepts depending upon stimulus-related design decisions. These types of issues are central to the development and proliferation of construal level theory (CLT) in psychology, marketing and other types of social science research.

The present research draws from Trope and Liberman’s (2010) suggestion that different people are predisposed to construe information along a continuum ranging from a very abstract representation of the information to a very concrete and detailed representation. CLT suggests that research design decisions required in conducting concept testing create psychological distances between the concept description and the research respondent (Fujita et al. 2008; Fujita
et al. 2006; Henderson et al. 2006). Testing method decisions that promote construing concept descriptions as psychologically close provide respondents with more concrete cognitive representations of the product concepts. Similarly, design decisions that create psychological distances cause respondents to construe concepts into more abstract representations. The most important conclusion from CLT findings for the present research is that both environmental and individual characteristics influence preferred construal levels (Higgins 2000; Higgins et al. 2003; Wright et al. 2012). Similarly, I propose that independent research decisions when designing and executing concept tests separately and interactively influence preferred construal levels and respondents’ subsequent evaluations of product concepts.

In summary, product concept testing is a critically important process in NPD, but is also an under researched topic. Product concept testing requires important research design decisions regarding respondent selection, information type, and appropriate presentation format when describing new product concepts. Research design decisions in each of these areas may influence concept test results independent of the product concept merits and thereby bias decisions regarding which concepts receive further development and market launch. The present research draws on CLT to demonstrate when and how decisions in each of these areas influence new product concept evaluations. A key implication will be that research design decisions lead to managers accepting and rejecting of product concepts for reasons other than the innate attractiveness of the concept itself.

The remainder of this manuscript as organized as follows. In Chapter 2, I review past concept testing research and best practice prescriptions found in the practitioner and academic literatures. Chapter 3 examines CLT applications in the marketing and psychology literatures. Chapter 4 combines insights from the new product concept testing literature with recent
advances in CLT to develop and justify hypotheses. Chapter 5 presents the results of five experiments that test these hypotheses. Finally, Chapter 6 discusses key implications this research has for marketing practice and theory.
CHAPTER 2
CONCEPT TESTING

Concept Testing in the NPD Process

The purpose of concept testing is to help managers determine (1) whether new product ideas warrant further investments and (2) obtain customer insights that improve product ideas before expending additional funds. Since the focus of this research is on concept testing, I will briefly review the overall NPD process and the key role concept testing plays in this process.

NPD begins with the generation of product ideas. New product ideation is a managed process that typically employs a multitude of different methods for identifying ideas from multiple sources. This includes direct questioning of customers for their product ideas and observational research to identify problems and solutions that customers cannot articulate. The goal in idea generation is to create a large number of ideas for evaluation in the concept screening stage.

A successful new product ideation process should create substantially more ideas than a firm can or should develop. Therefore, new product screening is a necessary process that typically occurs at two levels. First, managers make a preliminary determination regarding whether a product idea fits the company’s technical and marketing capabilities. This early screen eliminates most new product ideas. Second, potential customers examine the resulting subset of ideas through “product concept tests” in order to estimate market demand and obtain feedback for improving the idea. Product concept tests often involve qualitative and quantitative research. Both types of research require a formal expression of product ideas in “concept statements.” These statements consist of brief paragraphs, bulleted sentences, graphics, videos or even
physical prototypes that communicate the product concept’s core idea. Good concept testing results provide (1) recommendations for improving product ideas and (2) facilitates decisions regarding which product ideas warrant additional development investments.

The key dependent measure in quantitative concept testing is typically a five or seven-point scaled purchase intention question where respondents indicate whether they “Definitely will purchase” or “Definitely will not purchase” the product concept if it is marketed (Moore 1982; Schwartz 1987; Wind 1973). Many industry leading research firms and consumer product manufacturers track the relationship between purchase intention scores and whether product ideas become market successes. This performance tracking provides purchase intention “norms” that product concepts must attain in order to advance to the next stage of development. In addition, researchers often ask additional diagnostic questions concerning concept uniqueness, importance of the solution, believability of the benefits and ideas for improvement (Moore 1982, 1985).

The subset of ideas that survive product screening enter the product development stage. This stage is much more expensive than the screening stage because engineers and other internal company experts must transform abstract product ideas from written concepts into viable products or services. Concept testing facilitates this process by helping to determine the influence that alternative product attributes and features have on customers’ likelihood of purchasing the final product. Although this development stage often eliminates product concepts, the primary focus is on determining the optimal product design that will drive future sales. Importantly, at this stage of product development, concept statements frequently evolve into formats that are more sophisticated than found in the screening stage. Researchers often supplement written or verbal statements with photos, graphics, videos and even working
prototypes. Product concepts in the development stage warrant the additional time and financial investment in creating more informative concept statements because expenditures and risk dramatically increase with product launch.

Finally, the product launch stage includes all activities required to launch the fully developed product and monitor its early success. Customer research at this stage typically focuses on tactical decisions related to market positioning, branding, pricing, distribution and marketing communications. Concept testing at this stage often facilitates making final demand estimates under different launch scenarios (e.g., pricing, targeting, etc.). At this stage, fully developed advertisements and prototypes sold in simulated store environments often replace written concept statements.

In sum, concept testing is an integral component in multiple stages of the NPD process. Its primary contribution during the screening stage is to identify new product ideas that have the highest likelihood of achieving market success. In the development phase, concept testing improves product design decisions. In the launch phase, concept testing integrates the product concept with tactical marketing decisions to provide final forecasts necessary for creating manufacturing capacity and inventories.

Definition of Product Concept Statement/Description

Product concept statements are central to the conduct of concept testing. In contrast to the initial abstractness of the product idea, a product concept statement provides a more detailed representation of likely attributes and benefits. These brief statements communicate the essence of the product ideas and are suitable for sharing among management and potential customers (Haley and Gatty 1971). Early in the NPD process, product concepts are only ideas, so manager
cannot assess their potential through behavioral variables, such as new product trials or repeat purchasing. Instead, potential customers respond to concept statements that communicate information about the idea (Moore 1982). The concept statement format largely depends on the type of product, stage of product development and cost for developing working or non-working prototypes. Early in the NPD cycle, managers are hesitant to invest in unproven ideas, so concepts are frequently presented using relatively inexpensive formats including simple listings of proposed products’ performance attributes, brief written descriptions and pictorial or graphical representations. Concept statements often evolve into more complex and expansive formats during the NPD process as managers become more confident about an idea’s viability and the relative cost of further product development begins to dramatically increase (Batsell and Wind 1980).

Purchase Intention Questions and New Product Forecasting

At its core, quantitative concept testing presents respondents with a concept statement and then asks the respondents whether they would purchase a developed version of the product at a specified price. Therefore, the purchase intention question provides a bridge for estimating potential sales and is typically the most important result in concept tests (Crawford and Di Benedetto 2008; Moore 1982; Tauber 1981). The importance of concept testing and the purchase intention question is rooted in the ATAR model. This model is the foundation underlying the most common product forecasting methods. ATAR implies that new product sales are determined by:
Awareness… The percent of potential customers who are aware of the product.

Trial... The percent of potential customers who are aware and willing to try the product.

Availability... The percent of customers who have access to purchase the product.

Repeat... The percent of customers who try the product and purchase it again.

To arrive at a market forecast, market researchers successively multiply the total number of potential customers by anticipated awareness levels in the market, the probability of customers trying the product and the percent of the market where it will be available for sale. Finally, the total unit forecast for the launch period is determined by adding the total number of different customers expected to try the product to the frequency of these customers repurchasing. In order to create financial models, the unit forecast total is multiplied by the expected price to forecast revenue.

Data for this model comes from multiple sources. Specifically, the number of potential customers is normally estimated using secondary data. Sophisticated media models can accurately estimate awareness at different communications investment levels. Sales managers employ historical data and personal experience to estimate likely availability/distribution intensity. Finally, concept testing with potential customers provides purchase likelihood estimates used to forecast customer trial rates and repeat purchasing. Accurate estimation of customers’ purchase intention is generally the most inaccurate component in the ATAR model and frequently the determining factor in managers deciding to reject or further develop new product ideas.

The use of purchase intention questions is further complicated because years of market research experience finds that only a percentage of customers who intend to purchase follow through to actually purchase. In addition, only customers expressing moderate to high intention
to purchase the product concept are likely to buy the product. As a result, new product forecasters usually transform multiple scale points found in purchase intention questions into a binary categorical measure that combines all respondents who are inclined to purchase (i.e., “definitely will buy,” “probably will buy”) into a category of “likely buyers” with everybody else categorized as “unlikely buyers.” The percent of respondents who are “likely buyers” becomes the purchase probability metric used when evaluating concept potential and forecasting sales. Potential customers who are indifferent to the concept or negatively inclined toward it, become irrelevant when forecasting product demand. Managers often use personal experience or industry norms to downward adjust the “raw” purchase probability estimate by differentially weighting scale points, such as “definitely will buy” and “probably will buy,” to reflect likely differences in these respondents actually purchasing at a later date.

The global Booz Allen Sales Estimating System (BASES) provides one of the most respected new product testing methodologies available for forecasting new product sales. The BASES model integrates numerous consumer metrics such as purchase intention, value perceptions, transaction size and purchase frequency into an index score that can be compared across concepts to determine relative sales volume potential (BASES 2007). The estimated sales volume also incorporates factors such as the level of marketing efforts (Klink and Athaide 2006). Regardless of this methodology’s sophistication, BASES’s validity ultimately depends upon the reliability and predictive validity of purchase intention questions regarding concepts statements. Given this dependence, it is important to understand how research design decisions influence purchase decision responses from different types of customers exposed to different types of product concept information presented in different presentation formats (i.e., text only vs. text + visual).
The Influence of Concept Testing Design Decisions on Purchase Intention

The importance of concept testing in NPD motivated research into variety of factors related to the concept testing design and execution. Table 1 summarizes previous empirical research on concept testing. Much of this research focuses on various aspects in concept testing design that managers either control or account for when interpreting results. For example, Armstrong and Overton (1971) identify differences in respondent preferences for product concepts described with concept statements containing brief vs. comprehensive product descriptions. Klink and Athaide (2006) identify differences in how early vs. later adopters in a category respond to new product concepts. In general, the most important management decisions in this research identified are: (1) respondent selection, (2) presentation format, and (3) information type. I will briefly review each of these research streams.

Respondent Selection

Respondent selection is widely recognized as a key decision that practitioners must make when conducting concept tests. The most common criteria applied in these decisions are whether potential respondents are users of the product class, users of a specific product, and plan to make a purchase in the category in the near future. The obvious goal is to screen out respondents who are not in the target market or are unlikely to buy the development concept for reasons unrelated to the product itself. Although these are reasonable criteria, they do not reflect other types of respondent characteristics that may influence how respondents process information and make decisions in the artificial purchasing context created in concept testing versus natural purchasing environments.
From an academic perspective, this issue has received limited attention in the literature. As shown in Table 1, a notable exception is Wilton and Pessemier (1981) who demonstrate that increasing the amount of product information provided to consumers (i.e., low vs. intermediate vs. maximum level) positively increases respondent preferences for electric vehicles. Similarly, Schoormans, Ortt, and de Bont (1995) show that higher expertise respondents demonstrate greater consistency between concept evaluations and their evaluations of the real products. In essence, experts are better than non-experts at overcoming testing limitations caused by discrepancies between artificial purchasing environments for concept testing compared with the more natural task of evaluating real products in the market.

More recent research moves beyond product knowledge and expertise by examining a wider array of different respondent characteristics that influence concept testing results. For example, Klink and Athaide (2006) find that later adopters in a product category require more information than earlier adopters when assessing new product concepts. They reason that later adopters perceive greater risk in the concept testing environment that is allevied by additional product information. Therefore, they argue that when marketers include later adopters in concept tests, concept statements should more closely simulate the increased amount of product information normally available in the marketplace. This includes additional props such as prototypes or advertisements that help later adopters more fully understand product concepts. In addition, Hoffman, Kopalle, and Novak (2010) identified an “emergent nature” trait that captures differences in respondents’ abilities to imagine how product concepts might be further developed. They contend that personal characteristics encompassing the trait (i.e., openness to new experiences, verbal and visual processing styles, experiential and rational thinking styles,
creativity, and optimism) facilitate respondents’ ability to offer insights for refining and further developing product concepts.

The important implication from these studies is that respondent characteristics interact with the artificial concept testing environment to influence their stated purchase intention for new product concepts. Since product concept tests typically do not control for these characteristics, they have the potential to influence respondents’ reactions to product concepts in an unknown manner. Hence, differences in respondents’ abilities to comprehend concepts and accurately respond to purchase intention questions in artificial test environments may exert excessive and detrimental influences on concept test decisions.

Respondent characteristics, such as product knowledge and individual traits, are clearly important to understand and account for when conducting valid concept tests. However, these are not the only or even the most important individual differences to examine. As will be discussed in more detail, I believe past research provides substantial evidence that respondent age may have an even more important and unaccounted for influence in current concept testing practices.

Presentation Format

Industry accepted prescriptions regarding the development of concept statements focus on making concept descriptions as clear and realistic as possible without “overselling” the concept (Crawford and Di Benedetto 2003; Schwartz 1987). However, Lees and Wright (2004) note that concept statements are frequently developed and presented in very different formats that may influence respondents’ reactions to the concepts. For instance, concept statements often entail only a few simple, factual statements communicating a minimum number of product attributes. Alternatively, other statements are “commercialized” to include persuasive claims that
underscore the product concept’s newness or unique benefits relative to currently available products.

Conflicting findings in previous research make it difficult to draw firm conclusions regarding the influence that alternative concept formats have on respondents’ preferences. For example, Armstrong and Overton (1971) find that presenting concepts in brief versus comprehensive information formats did not affect purchase intention. Therefore, they argue for more testing with brief concept statements that require less time and money to develop rather than employing more elaborate and comprehensive statements. More recently, Lees and Wright (2004) find minor differences in respondents’ purchase intention for three different product concepts presented in formats they describe as stripped, embellished, and visual. As with Armstrong and Overton (1971), they conclude that the use of alternative concept statement formats is not important. In contrast, Holbrook and Moore (1981) find that pictorial presentations of product concepts lead to better preference scores than written presentations. These researchers suggest that including pictures in concept statements encourages holistic and integrative processing, which in turn produces a greater focus on design features.

Information Type

Although past research is inconclusive, it seems apparent that issues arising from uncontrolled influences with concept statement design are important in running valid concept tests. As previously noted, concept tests conducted early in the NPD process often use concept statements depicting the new product idea with bulleted lists of proposed product attributes (Page and Rosenbaum 1992). Although this facilitates having respondent evaluate multiple product concepts, O’Connor and Veryzer (2001) believe this simplified format diminishes predictive
validity. They propose that processing of product attribute and benefit information requires different levels of cognitive effort. In turn, differences in the effort expended leads to alternative mental representations of concepts. Specifically, Wu, Day, and MacKay (1988) argue that consumers must engage in an effortful integration of attribute information in order to formulate reliable purchase intention. In contrast, benefit information provides ready-made evaluations of product performance. So, respondents can more easily evaluate and establish reliable purchase intention when concept statements communicate benefit information. The present research extends this idea by proposing a more nuanced process based on CLT. Namely, I believe the selection of older and younger respondents interacts with the information type to enhance or diminish their purchase intentions.

Summary

In sum, accurate assessment of purchase intention is key to valid product concept testing. In practice, purchase intention scores appear to be moderated by numerous factors related to decisions made in designing concept tests. This is important because it represents unaccounted for error in purchase intention scores that reduces its ability to accurately estimate future market sales. This error is important and due to multiple factors. From a psychometric perspective, the maximum correlation between two measures is the squared reliability score of the least reliable measure. Therefore, design decisions that decrease purchase intention reliability also decrease the accuracy of resulting demand estimates. The creation of norms based on purchase intention measures compounds this error problem. Subtle differences in test procedures, respondent selection, concept statement designs can meaningfully move purchase intention scores. As a result, it is risky to compare results from a concept testing study employing one set of research
practices to the average performance of set of product concept tests employing a range of many different practices. Finally, potential interaction effects on purchase intention due to relationships between respondent selection, presentation format, and information type make accounting for these sources of error even more challenging.

The validity of comparing results from any two tests depends on the procedural similarities between the tests. Therefore, the obvious solution is to develop comparative norms for each combination of potential research design decisions. However, the complexity of incorporating such precision would require the development of many dozens of different norms based on the large number of different research contexts and concept testing decisions. This seems impractical, unlikely and potentially infeasible. Therefore, the best alternative is likely a continuation of the common practice of comparing purchase intention scores to norms based historical data. However, better knowledge regarding the biases embedded into research design decisions might provide an opportunity to refine the interpretation of these comparisons. For example, if older adults are known to typically respond 20 percent lower than younger adults in their purchase intention toward attribute based concept statements, then this knowledge can be factored into any comparison of this type of concept test to historical norms created from a wide range of different concept test results.

The next section will examine the viability of construal level theory as both a tool for identifying important sources of error in concept testing and estimating their likely effect on any individual concept tests results.
CHAPTER 3

CONSTRUAL LEVEL THEORY

Construal Level Theory and Mental Representation of Concepts

CLT suggests that stimuli are processed at different levels of abstractness by different people at different times. High-level construals represent abstract and ill-defined conceptualizations while low-level construals are concrete and detailed (Kardes, Cronley, and Kim 2006; Trope, Liberman, and Wakslak 2007). According to previous CLT research, there are four dimensions of psychological distance affecting individuals’ construal of information and their subsequent behaviors. These include temporal (when; near future vs. distant future), social (who; self vs. other), spatial (where; here vs. there), and hypothetical distance (whether; certain vs. uncertain) (Kim, Zhang, and Li 2008; Trope and Liberman 2003; Trope, Liberman, and Wakslak 2007; Zhang and Wang 2009; Zhao and Xie 2011). All four dimensions appear to follow the same general principles whereby individuals form higher level construals when target stimuli are temporally, socially, spatially, or hypothetically distant than when they are proximal (Fujita et al. 2006; Trope and Liberman 2003). A high-level construal is an abstract mental representation that reflects the gist of stimulus information, whereas a low-level construal is a concrete mental representation containing details or specific characteristics of the target stimuli. I will briefly review this research and discuss its implications for designing and understanding valid concept tests.
Traditional CLT Studies in Psychology

Temporal Distance

Research on temporal distance in construal theory suggests that people construct different mental representations of the same objects depending on whether the objects pertain to the near or distant future events (Liberman and Trope 1998; Trope and Liberman 2000). According to CLT, people construe objects and events in the near future as more specific, contextualized, and in low-level terms. In contrast, the same people will construe distant future events in more abstract, decontextualized, and high-level terms (Liberman and Trope 1998). As such, people considering near future-events are more likely to focus on the details of an event than those considering distant-future events (Trope and Liberman 2000).

In an early study on the effect of temporal distance on construal, Liberman and Trope (1998) asked respondents to describe either near (i.e., tomorrow) or distant (i.e., sometime next year) future events. They found that people have concrete and detailed representation for near-future rather than for distant-future events. For example, in the distant future ‘‘making a list’’ was described as ‘‘getting organized,’’ whereas in the near future this activity was described as ‘‘writing things down.’’ In another example, ‘‘paying the rent’’ was described as ‘‘maintaining a place to live’’ in the distant future and as ‘‘writing a check’’ in the near future.

In a more recent study, Fujita et al. (2008) argue that the temporal distance of attitude objects systematically changes what features of an attitude object are attended to and perceived as relevant. When attitude objects are temporally distant (vs. near), arguments highlighting primary (vs. secondary) features, desirability (vs. feasibility) features, and general classes (vs. specific cases) are found to be more effective for persuasion because increasing temporal
distance leads to greater attention to high- (i.e., more abstract) vs. low-level (i.e., less abstract) information (Fujita et al. 2008).

Thus, converging evidence suggests that distant future activities are represented in an abstract manner that highlights superordinate features, while near future activities are represented in a concrete manner that highlights subordinate features.

Spatial Distance

Spatial distance refers to events, people, or objects in near or distant physical locations. A number of studies have found that spatial distance influences construal levels in a similar manner to temporal distance. For example, Fujita et al. (2006) manipulated spatial distance information by showing subjects a video of two students interacting in NYU’s Washington Square campus. Subjects also received a written description of the events in the video. Participants in the spatially near condition were instructed to think that the students in the video were NYU students studying at the Washington Square campus in New York City, while participants in the spatially distant condition were instructed to think that the students in the video were NYU students studying at an NYU study-abroad location in Florence, Italy. Analysis of participants’ written descriptions found that participants in the spatially distant condition used more abstract language (i.e., predicate, adjectives) to describe events in the video than those in the spatially near condition.

Social Distance

Although CLT has mainly dealt with temporal distance, it has recently been extended to other dimensions, such as social distance (i.e., self vs. others, similar vs. dissimilar others, and
in-group vs. out-group members). Prior research consistently finds that when social distance increases from self (proximal social distance) to others (distal social distance), distal social targets are construed at a higher and more abstract level than a proximal social target (Kim, Zhang, and Li 2008; Liviatan, Trope, and Liberman 2008; Trope, Liberman, and Wakslak 2007; Zhao and Xie 2011).

Liviatan, Trope, and Liberman (2008) propose that dissimilar others’ actions compared to similar others’ actions, are represented at a higher level of construal. In one of their reported studies, participants were asked to read about a target person who had taken either similar or different classes as themselves and imagine the student engaging in various activities (i.e., reading, washing clothes, cleaning the house). For each activity, participants selected between a subordinate action identification (description highlighting the means by which the action is performed) and a superordinate action identification (description highlighting the end for which the action is performed) (Liviatan, Trope, and Liberman 2008). The results show that participants in the proximal social distance condition (i.e., similar target person) identify that person’s actions in relatively more subordinate means-related rather than superordinate ends-related terms compared to the participants in the distal social distance condition (i.e., dissimilar target person). In other words, it appears that, as social distance increases, information is represented in more abstract terms (i.e., high-level construals), whereas, as social distance decreases, information is represented in more concrete terms (i.e., low-level construals).

Hypothetical Distance

According to Wakslak et al. (2006), an event is removed from one’s direct experience when it could have happened but has not actually happened or when it is possible, but not
certain. A probable event is conceptualized as being more proximal than an improbable event, with increasing probability of occurrence reducing psychological distance. Wakslak et al. (2006) manipulated hypothetical distance by asking participants to sign up for a research assistantship position that they believed they were either likely or unlikely to receive. Participants in the low-probability condition (hypothetically distant) show a greater tendency to describe the job position in general, as opposed to specific terms than those in the high-probability condition (hypothetically near). Similarly, Chandran and Menon (2004) demonstrate that when individuals see health-related risk information framed by a day, the risk message is perceived as closer in time, more concrete, and more probable (thus evoking a greater sense of threat) than those framed by year.

Summary

Taken together, this literature review reveals that the four dimension of psychological distance in CLT – temporal, spatial, social, and hypothetical – have a common psychological influence whereby objects, events, or people that more distant (proximal) on any dimension are represented more abstractly (concretely).

Although these four dimensions are the most highly researched sources for creating psychological distance, a number of studies have introduced new causes or sources of distance that appear to influence preferred construal levels dimensions. These studies have examined interactions between these new factors and the four traditional dimensions as well as identifying new factors as independent causes of preferred construal levels. In the next sub-chapter, I examine some of the most interesting applications of CLT in consumer research and consider their implications for better understanding and executing more valid product concept tests.
Congruency of Construal Levels and Consumer Research Applications

Consumer researchers have primarily examined how construal levels influence consumer persuasion and product preferences. Particular attention has been paid to understanding how characteristics inherent in marketing stimuli interact with one or more of the four primary types of psychological distance to influence persuasion processes and results. The present research continues this tradition in its use of construal level as a tool to understanding and designing concept tests.

Prior consumer research emphasizes the persuasive impact of matching different characteristics found in marketing stimuli with consumers preferred construal level or internal mindset (Dhar and Kim 2007; Higgins 2000; Higgins et al. 2003; Steinhart, Carmon, and Trope 2013; Wright et al. 2012; Zhang, Fung, and Ching 2009). For example, Dhar and Kim (2007) find that highlighting higher level aspects of a message (i.e., core, central claims) rather than lower level aspects (i.e., peripheral claims) increases its persuasiveness for more psychologically distant objects or events (e.g., future events, distant locations). Previous studies have also found that persuasiveness improves by matching message frames and both consumer’s regulatory focus (Lee, Keller, and Sternthal 2010) and consumer’s mental representation (Thompson and Hamilton 2006). For instance, Thompson and Hamilton (2006) find that “concrete” comparative ads are more effective when analytical processing is primed, while “abstract” non-comparative ads are more effective when imagery processing is primed. Similarly, in a recent study, Yan, Sengupta, and Hong (2016) find that individuals are more likely to engage in visual rather than verbal processing for psychologically proximal than distant events. In other words, visual processing aids processing of concrete representations, whereas verbal processing facilitates processing of abstract representations. Overall, these findings suggest that the external factors
(such as those frequently controlled by marketers) are more effective when their level of abstractness matches the operant construal level in targeted consumers at that point in time.

**CLT and Its Implications for Concept Testing Design Decisions**

As the previous section indicated, CLT has implications for many aspects of consumer research. I believe it also provides very specific implications for market researchers designing concept tests. In particular, my research focuses on the implications CLT has for decisions regarding respondent selection, product concept information type and presentation format for presenting the concept statement.

**Age (Younger vs. Older) and Psychological Distance**

As previously reported, the effects of aging on consumer decision-making are a frequently researched topic in applied and theoretical consumer research. Understanding older consumers has long been a public policy priority, but it has increasing become an economic opportunity as the aggregated buying power of the segment increases. To date, much of the research regarding older consumers has focused on protecting them from the efforts of deceptive marketers trying to capitalize on their related information processing and memory deficiencies. Nonetheless, as discussed in the introduction, the increasing number of older consumers who are healthy, active and resource privileged also creates a very lucrative market for new and existing products and services.

Although older adult consumers have been the subject of much consumer research, no consensus exists regarding the age at which a consumer is considered “old.” Some of the earliest consumer research classified adults 50 years of age or more as being the “mature” market
According to Conaway (1994), the mature market is typically defined as consumers over the age of 50, but sometimes defined as those over the age of 55. More recently, older or mature consumers are more frequently defined as those being over the age of 55 (Kennett, Moschis, and Bellenger 1995; Moschis, Curasi, and Bellenger 2004) or even over 65 years of age (Oumlil and Williams 2000; Mattila, Karjaluoto, and Pento 2003). In this thesis, I define older adults as those over the age of 55 and younger adults as those between 20 and 30 years of age. This definition is consistent with recent age-related research examining information processing differences.

Working memory is a conscious, retained and reproducible mental event resulting from the interaction of individuals with their environment (Moschis 1994). The terms working memory and short-term memory are often used synonymously in reference to the amount of mental resources available to preserve new information while at the same time processing this and other information (Miyake and Shah 1999; Park et al. 1996; Salthouse and Babcock 1991). Researchers find that aging limits memory capacity and thereby diminishes working memory performance (John and Cole 1986; Moschis 2012; Moscovitch and Winocur 1995; Park et al. 2002; Salthouse and Babcock 1991; Yoon, Cole, and Lee 2009). For instance, Moscovitch and Winocur (1995) show that older adults are less capable than younger adults of processing large amounts of information during short time periods if they are engaging in ongoing cognitive activities such as reading, thinking, or problem solving. In addition, previous research finds that older adults, compared to their younger counterparts, tend to compensate for declining processing resources by adopting less cognitively demanding cognitive strategies (Mata, Schooler, and Risekamp 2007; Peters, Hess, Vastfjall, and Auman 2007; Yoon, Cole, and Lee 2009).
Studies also report that older consumers choose information processing and memory strategies that rely more on abstract thinking than their younger counterparts (Hong and Lee 2010; McGinnis and Zelinski 2000; Wingfield, Waters, and Tun 1998). Older consumers are believed to process information with more generalities and fewer concrete details because of increased difficulties in information encoding and retrieval (Salthouse, Babcock, and Shaw 1991). For example, Wingfield et al. (1998) show that when cognitive demands are taxed, older people select abstract memory representation strategies that compensate for their age-related information processing deficits. Because this strategy summarizes information more efficiently, it also improves overall information processing performance. Similarly, McGinnis and Zelinski (2000) examine the ability of older people to define words from unfamiliar contexts. In completing the task, older people utilized fewer components of the words’ potential meanings and relied more on abstract interpretations.

Information Type (Attribute vs. Benefit) and Psychological Distance

The previous discussion has important implications for how older consumers process product and service related information. Attributes are “descriptive features that characterize a product or service,” whereas benefits are “the personal value consumers attach to the product or service attributes” (Keller 1993, p. 4). These definitions focus on the distinction between the concrete and measurable features (attributes) of the product offering and more abstract benefits obtained when consuming the product (Wu, Day, and MacKay 1988). For example, some sellers may emphasize attribute information, in terms of physical features and quantitative aspects of performance while other sellers also highlight benefit information, such as convenience, prestige, and economy.
Previous research has applied CLT to better understand how attribute and benefit information is processed (Lamberton and Diehl 2013; Wang and Cole 2015). For instance, Lamberton and Diehl (2013) find that attribute information performs better under concrete construal processes while benefit information performs better under abstract construal processes. They explain that attribute information emphasizes concrete, detailed, means-end cognitions requiring low-level abstraction. In contrast, benefit information promotes abstract, global, and end-state cognitions leading to high-level abstract processing. The key implications are that consumers typically construe attribute information in more concrete terms (i.e., low-level construals) and construe benefit information in more abstract terms (i.e., high-level construals).

In addition, Wang and Cole (2015) examine how age and expertise interact to affect consumer reliance on attribute or benefit information in product evaluations. They find that younger experts evaluate products more favorably when they review attribute-based product information whereas younger novices evaluate products more favorably when they review benefit-based product information. In contrast, older consumers favored benefit-based product information, regardless of their level of expertise. Wang and Cole (2015) conclude that older consumers’ preference for benefit information overrides the increased processing abilities provided by expertise.

Presentation Formats (Verbal vs. Visual) and Psychological Distance

Cognitive psychology research suggests that verbal and visual processing modes serve different cognitive functions. Verbal (words) processing involves transforming target objects into symbolic representations that capture their semantic meaning. This process is relatively detached from sensory and perceptual experiences (Anderson and Bower 1973; MacInnis and Price 1987).
In contrast, visual processing retains the actual sensory and perceptual features of the target objects and is therefore more akin to direct, tangible experience with the objects (MacInnis and Price 1987; Wyer, Hung, and Jiang 2008).

Another strand of support for this line of research has to do with the CLT tenet that the construal levels (high vs. low) are associated with superordinate versus subordinate categories (Trope and Liberman 2010). According to Trope, Liberman and Wakslak (2007), words are often referred to superordinate categories while visual images are referred to subordinate ones. For instance, the word “car” denotes all types of cars of different colors, sizes and so on. However, the visual representation of “car” typically involves imagining a particular car, with many of its individual features specified (e.g., a large black BMW SUV).

Lastly, visual processing tends to produce more context-rich representations than verbal processing because it requires concrete and contextual details. For example, when forming a visual image of purchasing a car, consumers typically visualize not only the car itself, but a specific car dealer where they will purchase the car, and when they will make the purchase. In other words, if the context is not spatially and temporally constrained, visualizing a mental image of an event would be more difficult or even impossible (Wyer and Radvansky 1999).

Given that verbal and visual processing involves different levels of mental representations, Yan, Sengupta, and Hong (2016) propose that verbal and visual processing modes play an important intervening role in how people construe and therefore mentally represent concepts. Drawing on CLT, they argue that verbal processing is more likely to produce abstract representations rather than concrete representations because they promote symbolic processing. In contrast, visual processing produces concrete representations due to their promotion of direct involvement with the target objects. Experimental findings indicate that
subjects who were asked to think about a psychologically near (vs. distant) event in an initial
task, performed better in a subsequent task that required visual processing and worse in a task
requiring verbal processing. Furthermore, they find that participants not only show a greater
degree of visual processing for near (vs. distant) events, but the degree to which they engage in
visual (vs. verbal) processing mediates the effect of psychological distance on construal level
(Yan, Sengupta, and Hong 2016).

Summary

CLT has made important contributions to understanding how different people under
different circumstances construe or represent the world around them. When consumers receive
information construed at levels that match how they are currently construing information then
this match benefits persuasive processes. Lee, Keller and Sternthal (2010) demonstrate that when
newly processed information matches currently preferred construal levels, consumers process it
more efficiently and the information becomes both more accessible and valued. As a result,
consumers’ increased access to relevant information and improved favorability of the
information combine to enhance attitude.

Traditional multi-attribute attitude theory suggests that learned characteristics of attitude
objects (i.e., attributes and benefits) combine to form overall preferences which, in turn,
influence intentions regarding the objects (Bettman, Capon, and Lutz 1975). This is relevant to
understanding concept testing because it implies that respondents combine various types of
information presented in concept statements to form product attitudes. Purchase intentions are
important to attitude theorists and practicing marketers because they are more closely tied to
behaviors and include information not captured in attitudes. For example, a consumer may have
a positive attitude toward a product concept, but if the product is not available as needed in her geography, then her likely purchase behavior for the product may not reflect the positive attitudes. Therefore, practicing marketers frequently measure both attitudes and purchase intentions. In the next section, I propose that CLT is useful in understanding concept testing because it explains how consumers are likely to respond to information contained in concept statements. Most of the hypotheses in the next section employ a traditional theoretical framework whereby information contained in concept statements influences attitudes, which in turn, drives purchase intentions.
CHAPTER 4
HYPOTHESES DEVELOPMENT

In practice, most concept statements provide either attribute information or both attribute and benefit information. As previously noted, “attributes only” concept statements are useful because their specificity facilitates product design decisions without introducing potential biases from featuring non-relevant and supposed benefits to different customer groups. “Attributes and benefits” are typical when marketers better understand which benefits potential target markets desire. This type of concept statement is also more consistent with the marketing maxim that customers purchase benefits not attributes. Nonetheless, attribute information is useful when its related benefits are easily inferred or when the attribute’s presence enhances believability of the promoted benefit. I found no previous research in either academic or trade journals that “benefit only” product concept statements are ever created or tested. Therefore, the present research primarily examines questions related to either “attribute only” or “attribute and benefits” product concept statements.

H1 extends previous consumer research findings by examining how age difference and information type interact to influence purchase intention for product concepts. The primary purpose of H1 is to examine whether CLT is applicable in concept testing research and to gain insights for conducting future research. H2 focuses on how preferred construal levels change as adults age. Specifically, it examines whether preferred construal levels change linearly over all ages or remain stable until increasing in older adults (i.e., 55 years old or older). H3-H4 address issues related to “attribute only” concepts statements used early in the NPD process. Finally, H5 focuses on testing of “attribute and benefit” concept statements relative to “attribute only”
concept statements. This provides a different type of test for CLT since respondents are not restricted to processing either attribute or benefit information. In this test, respondents have an opportunity to process and use either or both types of information to form their purchase intention. Thus, this provides a more natural and realistic test of CLT in a marketing context.

The Effects of Age and Information Type

The first hypothesis specifies the basic question examined in this dissertation. Namely, are previous CLT findings in consumer research with “older” and “younger” adults applicable in the concept testing context. Past consumer research consistently finds that relative to younger consumers, older consumers naturally construe information more abstractly in order to overcome age related information processing deficiencies (Hong and Lee 2010; McGinnis and Zelinski 2000; Wang and Cole 2015). Benefit information is by definition an abstraction from concrete product attributes or features, so directly providing benefits creates efficiencies that facilitate information processing for older consumers. In the present research, this implies that older respondents should prefer product concepts depicted by benefits compared to those depicted by product attributes. In contrast, younger respondents possess sufficient processing resources to facilitate easy processing of attribute information and prefer that type of information. As a result, younger consumers should prefer concepts presented in attribute only concept statements compared to concept statements providing only benefits. Formally, I propose a matching effect whereby respondent selection and information type interact to enhance positive attitude toward the product concept, which in turn, improve purchase intention for the product (see also Figure 1).
H1a: Younger respondents will have more positive attitude toward attribute-based concepts than benefit-based concepts while older respondents will have more positive attitude toward benefit-based concepts than attribute-based concepts.

H1b: The indirect effects of information type on purchase intention through attitude toward product concepts will be conditioned upon age differences.

The Effects of Age on Construal Level

Previous research in aging and developmental psychology hypothesizes an abstraction-deficit whereby memory deficits in older adults cause them to prefer processing information with more generalities and fewer specific details relative to younger adults (McGinnis and Zelinski 2000). In other words, older adults prefer to think more abstractly than younger adults. Consistent with this finding, Hong and Lee (2010) directly measure construal levels of older adults 19 to 70 years of age and find a positive correlation between age and chronic construal level. While previous aging research also argues that the ability to manipulate (i.e., processing speed) and retain (i.e., memory) acquired information steadily declines over one’s life span, there is a marked decline beginning late middle age (i.e., 60-70 years of age) (Lindenberger, Mayr, and Kliegl 1993; Park et al. 1996). Thus, it is unlikely that a strictly linear relationship exists between age and preferred construal levels. H2 proposes a non-linear relationship where chronic construal levels remain stable or moderately increase throughout adulthood, but become markedly more abstract around 60 years of age.
H2: Chronic construal levels remain stable throughout adulthood until late middle-age when they become increasingly abstract.

The Effects of Mindset and Age

H1 suggests a direct replication of previous consumer research findings concerning aging and changing construal levels in a concept testing context. However, as previously mentioned, product managers often exclude benefit information early in the NPD process in order to focus on attributes related to product and service development. H3 and H4 examine and make similar predictions under several additional conditions that are relevant when studying “attribute only” concept statements.

Trope and Liberman (2010) argue that preferences for a particular type of information (i.e., attribute vs. benefit) should change when situational cues prime people to change their preferred construal levels. Freitas, Gollwitzer, and Trope (2004) developed a priming task that instructs people to think about abstract versus concrete ways to achieve a goal. Priming subjects to think about “why” achieving the goal is important induces an abstract mindset while considering “how” to achieve the goal creates a concrete mindset. This research finds that prompting mindsets to match stimuli characteristics diminishes the deleterious information processing effects caused by inconsistencies between existing construal levels and stimulus characteristics.

This has potentially important implications for when older respondents participate in “attribute only” concept tests. Specifically, older respondents are less inclined than younger respondents to devote cognitive resources to processing detailed, concrete information, such as contained in the attribute only concept statements. However, priming older adults to process
concrete information might overcome their reticence to process product attribute information in concept tests. This is important because a successful priming mechanism for older consumers should provide market researchers better access to accurate opinions and feedback regarding “attribute only” new product concepts.

I predict that priming older respondents participating in “attribute only” concept tests will provide significant research benefits. Namely, a successful priming process will facilitate older respondents processing attribute information due to their having a “concrete mindset.” As I mentioned in previous chapter, this match will enhance positive attitude toward the product concept, which in turn, improve purchase intention for the product. In contrast, younger respondents already possess abundant processing resources and a preference for processing this type of information. Therefore, the concrete mindset prime is expected to have limited influence how younger respondents process and respond to the attribute information.

Thus, I hypothesize the following effects regarding information processing of “attribute only” concept statements (see also Figure 2).

H3a: Priming a concrete mindset, compared to no prime control condition, will create more improvement in attitude for product concepts described with attribute only information among older respondents than among younger respondents.

H3b: The indirect effects of mindset on purchase intention through attitude toward product concepts will be conditioned upon age differences.
The Effects of Presentation Format and Age

As previously discussed, concept statements may or may not include visual images of the product concept depending upon the concept development stage. Nonetheless, the use of images is highly encouraged by both academic researchers and industry leaders when such images are available (IPSOS 2005). As discussed in the previous chapter, visual processing creates more concrete representations of concepts whereas verbal processing yields more abstract representations (Yan, Sengupta, and Hong 2016). Thus, the addition or removal of visual images has the potential to change or alter respondents’ preferred construal levels. I expect that the inclusion of visual images in concept statements should promote more detailed or concrete processing of attribute information. Moreover, I believe the effect will be stronger in older respondents because they are inherently less inclined than younger respondents to process attribute information. As predicted in H3, this interaction effect will enhance positive attitude toward the product concept, which in turn, increases purchase intention for the product. This reasoning leads to the following hypotheses (see also Figure 3).

H4a: Adding product images, compared to no image control condition, will create more improvement in attitude for product concepts described with attribute only information among older respondents than among younger respondents.

H4b: The indirect effects of presentation format on purchase intention through attitude toward product concepts will be conditioned upon age differences.
The Effects of Age, Information Type, and Presentation Format

As previously discussed, the prevalence of “attribute only” concept statements decreases as the new product development stages progress. As product concepts begin to near the launch date, it becomes increasingly important to understand the influence of product benefits on target audiences. Thus, more elaborate concept statements are created that include both attribute and benefit information. Previous academic research examines processing of “attribute” or “benefit” information, so little is known about how individual consumers might evaluate concept statements containing both attribute and benefit information. Therefore, I examined how younger and older adults process a concept statement differently when both types of information are provided.

When respondents are asked to evaluate concept statements that include both attribute and benefit information, I anticipate that younger adults will place more value on the attribute information whereas older adults will more highly value the benefit information. Thus, I expect older adults will have more positive attitudes toward new product concepts depicted with “attribute and benefit” information because of the incremental value they perceive in the benefit information. In contrast, younger respondents will only have modest or no improvements in attitude toward the concepts depicted with “attribute and benefits” because the benefit information is not valued. Thus, younger subjects will likely consider benefit information to be neutral or irrelevant rather than negative and detrimental to attribute information. In contrast, older adults will penalize the “attribute only” information because it does not provide the benefit information they desire.

The above reasoning leads to the following hypothesis.
H5a: The addition of benefit information to attribute based concept statements will create more improvement in attitude among older respondents than among younger respondents.

Importantly, age, information type, and presentation format have the potential to produce a significant three-way interaction effect on attitude. The existence of this interaction will be examined in the analysis section of this thesis. No formal hypothesis is proposed because I believe that independent interaction effects from age with information type and age with presentation type are likely to individually create ceiling effects that preclude finding a significant three-way interaction influence on attitude toward the product concept.

In sum, combined with H4a and H5a, this study tests a moderated mediational model where both information type and presentation format moderate the indirect relationship between age differences and purchase intention via attitude toward the product concept (see Figure 4). Therefore, I hypothesize:

H5b: The indirect effects of age differences on purchase intention will be mediated by attitude toward the product concept and conditioned upon information type and presentation format.
CHAPTER 5

METHODS AND RESULTS

Study 1

H1, Study 1 proposed that younger respondents will have higher purchase intention for product concepts described with attribute rather than benefit information and older respondents will have higher purchase intention when a concept is described with benefit rather than attribute information. The primary purpose of Study 1 is to test this proposition and its implication for CLT in concept testing research. With respect to product concept testing, a notable limitation of this study is that no evidence was found that practicing marketers actually develop and test “benefit only” concept statements.

Design

A 2 (respondent selection: younger vs. older) x 2 (information type: attribute vs. benefit) between-subjects experiment was conducted where subjects evaluated a new electronic toothbrush product concept. The procedure randomly assigned older and younger respondents to read a concept statement depicting the new product with either product attributes or product benefits. The dependent measure was respondents’ purchase intention for the electronic toothbrush concept.

Subjects and Procedure

Subjects for the online experiment were recruited from Amazon’s Mechanical Turk (MTurk) panel. A total of 426 subjects were invited and indicated their age group (i.e., under 20,
20-30, 31-49, 50 and older). Those who selected either “under 20” or “31-49” age group exited the study, leaving 170 participants. Data from four of these subjects were deleted from all analyses because they provided inconsistent answers regarding their age in the screening and subsequent demographic questions. This resulted in a total of 166 subjects with 83 20-30 years of age (58 males, $M = 26.05$) and another 83 50-71 years of age (35 males, $M = 56.83$).

Subjects answered a series of background questions before starting the experiment. This included a subset of items from Zaichkowsky’s (1985) involvement measure. This six-item measure used a 7-point scale and reliably assessed whether subjects consider tooth brushing to be important, a concern, relevant, meaningful, useful, and significant ($\alpha = .95$). The online questionnaire randomly assigned subjects from the two age groups to read one of two concept statements describing a new electronic toothbrush. One of these statements described the concept by providing three benefits while the second provided three product attributes that were related to the attributes (see Appendix A). Subjects could not advance beyond the concept statement page for 15 seconds. After reviewing the concept statement, subjects indicated their attitude and likelihood of purchasing the product. Attitude toward the product concept statement (very unfavorable / very favorable, very bad / very good, dislike very much / like very much) and purchase intention at an average item price (definitely buy / definitely buy) were both assessed using a 7-point scale. Finally, subjects answered several demographic questions.

Analysis and Results

Moderated mediation analyses. H1 implies the moderated-mediation model depicted in Figure 1. The model was estimated using PROCESS Model 7 from Hayes (2013), with 5,000
bootstrapping samples. Age groups were coded 1 = younger and 2 = older, and the information type was coded 0 = attribute-based concept statement and 1 = benefit-based concept statement.

The interaction effect between information type and age on attitude toward the product concept was not significant ($\beta = .08, p = .85, 95\% CI [-0.7100, 0.8617]$). In addition, the index of moderated mediation was also not significant ($\beta = .07, 95\% CI [-0.6724, 0.8040]$), indicating that the interaction effect of information type and age on purchase intention was not mediated through attitude toward the product concept. Thus, both H1a and H1b were not supported.

Although H1 was not supported, further analyses were performed to examine whether there is an interaction effect between information type and age on purchase intention independent of attitude. An ANOVA analysis on purchase intention was performed using a 7-point purchase intention scale to test the interaction effect. Although the direction is correct, the interaction is not statistically significant ($F(1, 162) = 1.28, p = .26$).

Lastly, as is typical in concept testing research, the 7-point purchase intention scale was converted into a binary purchase probability variable by coding the top three-box scores “definitely buy,” “probably buy,” and “possibly buy,” as “1” and the bottom-four box scores “definitely not buy,” “probably not buy” “possibly not buy,” and “might or might not buy” as “0.” A binary logistic regression model revealed the predicted respondent selection x information type interaction ($\beta = 1.35, \chi^2 (1) = 3.77, p < .05$; see Figure 5). Follow-up analyses based on the two 2 x 2 contingency table indicated that younger respondents were more likely to have a higher purchase probability when the concept was described with attribute information (74%) than it was described with benefit information (55%; $\chi^2 (1) = 3.44, p < .05$). However, older respondents did not show any significant difference across the information types ($\chi^2 (1) = .90, \text{NS}$). Looked at differently, older respondents (79%) tend to have a higher purchase probability than younger
participants (55%, $\chi^2 (1) = 5.47, p < .01$) when the concept was described with benefit information. However, when respondents evaluated attribute concept statements, age differences did not influence purchase probability ($\chi^2 (1) = .20, \text{NS}$).

In sum, this result showed that younger respondents responded more positively to the product concept described with attribute information than benefit information. In contrast, information type did not influence older respondents’ purchase probability. Thus, the significant interaction effect is primarily due to strong preference younger adults demonstrated toward attribute versus benefit information.

Discussion

Study 1 results did not support H1. The results indicated no interaction effects between information type and age on attitude toward the product concept. Moreover, the moderated mediation analysis revealed that the interaction effect on purchase intention was not mediated by attitude toward the product concept. This might be due to older subjects being more involved in tooth brushing than younger subjects ($M_{\text{older}} = 6.63$, vs. $M_{\text{younger}} = 5.92$; $F (1, 164) = 20.99, p < .001$) and willing to focus more attention on attribute information. Although CLT predicts older adults should prefer abstract benefit information, higher involvement in the product category may have caused them to pay more attention to the attribute information than would be normally expected.

In addition, a post-hoc examination of the concept statement stimuli (see Appendix A) by dissertation committee members raised questions regarding whether the “attribute only” statement actually contained benefit information. This concern is addressed in later studies.
Nonetheless, these findings are supportive of the basic premise that common concept testing design decisions are able to significantly bias test results.

Study 2

As a precursor to studying CLT among older versus younger consumers, it is important to understand whether chronic construal levels increase linearly with age throughout adulthood, remain stable, or begin to increase at an older age (i.e., 60 years of age). Based on the previously cited developmental psychology literature, H2 posits that preferred construal levels remain stable throughout adulthood until becoming increasingly abstract as people approach and exceed 60 years of age.

Design

Subjects ranging from 20 to 82 years of age completed Vallacher and Wegner’s (1989) behavior identification form (BIF) scale to measure preferred construal levels. The BIF measure was originally conceived as a trait measure of preferred construal levels, but recent research shows that BIF scores shift in response to traditional psychological distance manipulations (Forster, Liberman, and Shapira 2009).

Subjects and Procedure

The same screening procedures employed in Study 1 were performed. As a result, 173 subjects (94 males, age range = 20-82, M = 42.17) were recruited from MTurk. After providing their informed consent, subjects completed the 25-item BIF scale (see Table 2), which describes a series of actions (e.g., washing clothes) using both a low-level (e.g., putting clothes into the
machine) and a high-level (e.g., removing odors from clothes) construal. Subjects select the most appropriate of two descriptions for each of 25 activities.

Analysis and Results

BIF scores are calculated by determining the number of instances across 25 hypothetical activities where subjects indicate a preference for information construed at a high level. To examine the effects of age differences on BIF scores, linear, logarithmic, and quadratic regression models were estimated. Thus, subjects who always prefer high level construals will score “25” while subjects who never prefer high level construal score “0.” The logarithmic model was not significant \( p > .10 \), but both the linear \( \beta = .10, F (1, 171) = 7.94, p < .01 \) and quadratic \( \beta = .01, F (2, 170) = 6.23, p < .01 \); see Figure 6) models were significant. The quadratic regression model explained more variance \( R^2 = .07 \) vs. \(.04\).

Based on Figure 6, a direct comparison between younger (age range: 20-30) and older (age range: 55-82) groups was created by deleting the mid-age group (age range: 31-44) and conducting a one-way ANOVA on the mean BIF scores across the two age groups. As expected, this analysis found a significant effect for age on BIF scores \( F (1, 87) = 4.71, p < .05 \) with older respondents \( M_{\text{older}} = 16.73 \) having higher preferred construal levels than younger respondents \( M_{\text{younger}} = 13.96 \).

Discussion

As expected, the results of Study 2 reveal that age is positively associated with BIF scores. As a result, these findings replicate the age effect on construal levels reported by Hong and Lee (2010) where older adults construe the same actions at a more abstract level than do
younger adults. However, the quadratic regression model estimated here provided a better fit than the linear regression model. Thus, BIF scores increase over adulthood, with a marked increase at about 60 years of age. In other words, chronic construal levels do not increase linearly throughout the life span. In sum, findings from Study 2 support H2.

Pretest

Product Category and Stimuli Selection

By following the previous screening procedures, 50 younger (31 males, age range = 22-34, \( M = 27.98 \)) and 50 older (25 males, age range = 55-73, \( M = 60.06 \)) subjects were recruited via MTurk and asked to evaluate a series of concept statements (see Appendix B) reflecting new product ideas from different categories. The primary of purpose was to find product categories with similar levels of product involvement, moderate levels of understanding, and avoid extreme preference levels among different age groups.

Three items from Zaichkowsky's (1985) involvement measure were administered using a 5-point semantic differential scale (i.e., unimportant to me / important to me, of no concern to me / of concern to me, and irrelevant to me / relevant to me). Reliability scores for this measure ranged from \( \alpha = 0.95 \) to \( \alpha = 0.98 \) across the four product categories.

After answering the involvement items, subjects respond to subjective and objective expertise measures, which were adopted from published scales (Clarkson, Janiszewski, and Cinelli 2013). Subjective expertise was measured with a four-item scale (i.e., not knowledgeable at all / very knowledgeable, not much expertise at all / a lot of expertise, not much information at all / a lot of information, not much understanding at all / a lot of understanding). Reliability
scores ranged from $\alpha = 0.93$ to $\alpha = 0.95$ across the four product categories. In addition to subjective expertise, subjects were asked to respond to an objective expertise measure with a four item scale (i.e., “How many different brands of pain relievers have you tried?” - a small number / a large number, “How often do you try new pain relievers?” - rarely / frequently, “How frequently do you currently take pain relievers?” - not often at all / very often, “How often have you used pain relievers in the past?” - rarely / frequently. Reliability scores ranged from $\alpha = 0.87$ to $\alpha = 0.92$ across the four product categories.

Based on the results (see Table 3) of the pretest, home security and health monitor products were selected for further studies.

Study 3

As previously discussed, CLT suggests that older adults have limited cognitive resources and prefer to process and hold information at higher construal levels. Nonetheless, construal levels are flexible and can change as a result of environmental cues or through deliberate priming tasks. Successfully changing construal levels for older adults from their normally preferred abstract levels to concrete levels should facilitate older consumers processing of attribute information. Therefore, priming a concrete mindset may be a useful tool to improve the predictive validity of older adult’s purchase intention scores related to product concepts depicted with attribute data. This reasoning is the motivation behind H3 and the purpose for conducting Study 3.
Design

A 2 (respondent selection: younger vs. older) x 2 (mindset: control vs. concrete) between-subjects design was employed. Following prior research (e.g., Freitas, Gollwitzer, and Trope 2004), subjects went through a concrete construal priming task before evaluating the product concept statement.

Subjects and Procedure

Sixty-one younger subjects (37 males, age range = 20-30, \( M = 26.48 \)) and 56 older subjects (36 males, age range = 55-72, \( M = 61.34 \)) were recruited via MTurk by the same screening procedures used in previous studies. First, subjects from both age groups were assigned to a construal-level priming condition (control vs. concrete). Concrete construal level was primed using a task adopted from Freitas, Gollwitzer, and Trope (2004). Specifically, subjects in the concrete condition wrote directions (e.g., “how they would pursue the goal of improving and maintaining one’s physical health”) for performing a task providing three increasingly “concrete” instructions. In contrast, those in the control condition did not complete this task nor any filler task. This procedure is consistent with those used in previous studies (e.g., Malkoc, Zauberman, and Bettman 2010). In these studies and in this present research, the concern is that filler tasks might influence subjects’ construal levels.

Next, as a manipulation check, subjects in a holdout sample (62 younger subjects: 36 males, age range = 20-30, \( M = 27.35 \) and 56 older subjects: 28 males, age range = 55-81, \( M = 61.38 \)) completed the BIF questionnaire (Vallacher and Wegner 1989).

Subjects were then instructed to move on to an ostensibly different study asking for feedback regarding a new home security product (see Appendix B). Subjects indicated their
involvement with the product category using the same three-item measure from the pretest followed by the subjective and objective expertise questionnaires. Subjects then evaluated the “attribute only” concept statement and indicated their attitude and likelihood of purchasing the product. Attitude toward the product concept statement (very unfavorable / very favorable, very bad / very good, dislike very much / like very much) and purchase intention at an average item price (definitely buy / definitely buy) were both assessed using a 5-point scale. The concept statement remained visible on screen while subjects answered the questions. Finally, subjects answered a series of diagnostic questions including concept uniqueness, believability, and category purchase intention.

Analysis and Results

Control variables. To determine whether product category involvement and both subjective and objective expertise create confounds to control in subsequent analyses, one-way ANOVA analyses were used to test for differences on key variables across the two age groups. One-way ANOVAs on product involvement (\(\alpha = .93; M_{\text{younger}} = 3.48 \text{ vs. } M_{\text{older}} = 3.50, F(1, 115) = .01, \text{ NS}\)), subjective expertise (\(\alpha = .93; M_{\text{younger}} = 2.48 \text{ vs. } M_{\text{older}} = 2.32, F(1, 115) = .81, \text{ NS}\)), and objective expertise (\(\alpha = .91; M_{\text{younger}} = 1.91 \text{ vs. } M_{\text{older}} = 2.03, F(1, 115) = .44, \text{ NS}\)) revealed no differences between younger and older subjects.

Manipulation check. A one-way ANOVA on subjects' BIF scores across subjects in the holdout sample and those from the concrete construal-level manipulation found that subjects in the concrete condition (\(M_{\text{concrete}} = 14.19\)) showed lower levels of construal than subjects in the control condition (\(M_{\text{control}} = 16.25; F(1, 120) = 2.65, p < .05\)).
Moderated mediation analyses. H3 implies the moderated-mediation model depicted in Figure 2. The model was estimated using PROCESS Model 7 from Hayes (2013), with 5,000 bootstrapping samples. Age groups were coded 1 = younger and 2 = older, and the construal-level manipulation was coded 0 = control condition and 1 = concrete condition. Thus, the model tested whether the priming mindset interacted with age to improve attitude toward the product concept and, as a consequence, greater purchase intention. In other words, when older subjects (but not younger subjects) evaluated the “attribute only” concept statement, the manipulated concrete mindset would increase purchase intention by improving attitude toward the product concept.

The concrete mindset prime improved attitude toward the concept statement for the “attribute only” concept statement only among older subjects ($\beta = .72, p < .01, 95\% \text{ CI } [0.2686, 1.1792]$). Furthermore, simple slope analyses (see Figure 7) indicates that when older subjects evaluated the concept statement, the effect of a concrete mindset on attitude was significant in a positive direction ($\beta = .64, 95\% \text{ CI } [0.3158, 0.9732]$). In contrast, when younger subjects assessed the statement, the effect was not significant ($\beta = -.08, 95\% \text{ CI } [-0.3945, 0.2357]$). In other words, priming a concrete mindset (compared to no prime control condition) created more improvement in attitude for the “attribute only” product concept statement among older subjects than among younger subjects.

Moreover, the index of moderated mediation was also significant ($\beta = .53, 95\% \text{ CI } [0.1861, 0.9797]$), indicating that the interaction effect of age and mindset on purchase intention was mediated through attitude toward the product concept. When older subjects evaluated the product concept statement, the conditional indirect effect of mindset on purchase intention via attitude was significant in a positive direction ($\beta = .47, 95\% \text{ CI } [0.1955, 0.8191]$). In contrast,
when younger subjects evaluated the statement, the effect was non-significant ($\beta = -.06, 95\% \text{ CI} [-0.2903, 0.1587]$). In addition, the direct effect of mindset on purchase intention was non-significant ($\beta = .09, \text{NS}, 95\% \text{ CI} [-0.2172, 0.3950]$). Hence, attitude fully mediated the interaction effect between age and mindset on purchase intention.

Lastly, to test H3 using purchase probability (top-two box scores on the purchase intention measure), the same moderated-mediation approach was used. Once again, the index of moderated mediation was significant ($\beta = 1.10, 95\% \text{ CI} [0.3259, 2.2430]$). Moreover, attitude mediated the effect of mindset on purchase intention only when older subjects evaluated the concept statement ($\beta = .98, 95\% \text{ CI} [0.3305, 1.9561]$), but not among the younger subjects ($\beta = -.12, 95\% \text{ CI} [-0.7188, 0.3347]$). The direct effect of the construal level manipulation on purchase intention was not significant ($\beta = -.04, \text{NS}, 95\% \text{ CI} [-0.8505, 0.7678]$).

Discussion

The purpose of Study 3 was to investigate the interaction effects of mindset and age differences on attitude toward the “attribute only” product concept statement and, to examine whether age moderates the mediated relationship from mindset to purchase intention via attitude.

In support of H3a, the moderation analysis revealed that the positive association between mindset and attitude was stronger among older than younger adults. Moreover, this interaction influenced purchase intention (and purchase probability) through attitude toward the product concept. This finding supports H3b.
Study 4

H4 proposes that different types of presentation formats (no image vs. image) influence older adults’ construal levels and thereby their processing of attribute information. Specifically, previous research finds that the mere presence of visual images causes construal levels to become less abstract and more concrete. Thus, the inclusion of visual images may be another useful tool for encouraging a closer examination of attribute information among older consumers.

Design

A 2 (respondent selection: younger vs. older) x 2 (presentation format: no image vs. image) between-subjects design was employed. Older and younger subjects were randomly assigned to conditions where they evaluated an “attribute only” concept statement that either had or did not have a related product image.

Subjects and Procedure

By following the same screening procedures, 57 younger subjects (33 males, age range = 20-30, $M = 26.40$) and 59 older subjects (25 males, age range = 55-82, $M = 63.02$) were recruited from MTurk. Subjects were instructed that a manufacturer is in the process of developing a new home security product and interested in their opinions about the product’s market potential. First, subjects answered the same product category involvement and the expertise questions used in Study 3. Next, the survey software randomly assigned subjects to either the “no image” or “image” conditions. Subjects in the “no image” condition reviewed an attribute-based concept statement containing only a written product description, whereas those in the “image” condition
reviewed the same concept statement with additional visual images (see Appendix C). All subjects reviewed the concept statement for at least 15 seconds. Finally, subjects proceeded to the next computer screen where they answered manipulation check questions. Previous research defines consumption vision as the ability to construct vivid or concrete mental images of product-related behaviors and their consequences (Phillips, Olson, and Baumgartner 1995). Thus, higher consumption vision scores suggest lower level construals that entail more specific, detailed, and vivid features of objects or events. The four-item consumption vision measure in Appendix D was adapted from Phillips, Olsen, and Baumgartner (1995), as a manipulation check for construal level. Finally, subjects were asked to respond to the same attitude and purchase intention measures assessed in Study 4.

Analysis and Results

Control variables. A one-way ANOVA on product involvement ($\alpha = .98$; $M_{\text{younger}} = 3.14$ vs. $M_{\text{older}} = 3.28$, $F(1, 114) = .29$, NS), subjective expertise ($\alpha = .94$; $M_{\text{younger}} = 2.38$ vs. $M_{\text{older}} = 2.47$, $F(1, 114) = .19$, NS), and objective expertise ($\alpha = .92$; $M_{\text{younger}} = 2.09$ vs. $M_{\text{older}} = 1.87$, $F(1, 114) = 1.11$, NS) revealed no differences between younger and older respondents.

Manipulation check. A one-way ANOVA of the “consumption vision” manipulation check measures revealed a significant effect from the inclusion of an image on construal level. Subjects in the “image” condition ($M_{\text{image}} = 3.91$) showed higher levels of consumption vision than subjects in the “no image” condition ($M_{\text{no image}} = 3.36$; $F(1, 114) = 10.16$, $p < .01$).

Moderated mediation analyses. H4 implies the moderated-mediation model depicted in Figure 3. The model was estimated using PROCESS Model 7 from (Hayes 2013), with 5,000 bootstrapping samples. Age groups were coded 1 = younger and 2 = older, and the presentation
format was coded 0 = “no image” and 1 = “image.” Thus, the model examined whether the inclusion of image to the concept statement, which in turn would improve attitude toward the product concept and, as a consequence, increase purchase intention. In other words, when older subjects (but not younger subjects) assessed the “attribute only” concept statement, the inclusion of image would increase purchase intention by improving attitude toward the product concept.

As can be seen in Figure 8, the inclusion of image improved attitude toward the “attribute only” product concept only when older subjects evaluated the concept statement ($\beta = .52, p < .05, 95\% CI [0.0459, 1.0868]$). Furthermore, simple slope analyses showed that when older subjects evaluated the concept statement, the effect of adding images on attitude was significant in a positive direction ($\beta = .66, 95\% CI [0.2597, 1.0537]$). However, when younger subjects evaluated the statement, the effect was non-significant ($\beta = .14, 95\% CI [-0.2676, 0.5402]$).

Moreover, the index of moderated mediation was significant ($\beta = .49, 95\% CI [0.0038, 1.0763]$), indicating that the interaction effect of presentation format and age on purchase intention was mediated by attitude. More specifically, when older subjects evaluated the product concept statement, the conditional indirect effect of presentation format on purchase intention via attitude was significant in a positive direction ($\beta = .62, 95\% CI [0.2536, 1.0937]$). In contrast, when younger subjects evaluated the statement, the effect was non-significant ($\beta = .13, 95\% CI [-0.2338, 0.5238]$). In addition, the direct effect of mindset on purchase intention was non-significant ($\beta = -.17, NS, 95\% CI [-0.5109, 0.1802]$). Thus, the moderating effect of age and presentation on purchase intention was completely mediated by attitude, which supports H4b.

Finally, H4b was also tested using purchase probability employing the same moderated-mediation analysis just described. The index of moderated mediation was not significant ($\beta$
= .72, 95% CI [-0.0101, 1.8286]. Therefore, H4b was not supported when using purchase probability as a dependent variable.

Discussion

Study 4 replicated the moderated mediated effects found in Study 3 with different manipulation strategies. In support of H4a and H4b, the moderation analysis revealed that for older subjects, the effect of adding images to product concept statements significantly improves attitude and purchase intention relative to younger subjects. Moreover, the improvement among older adults in consumption vision suggests this effect is due to older adults processing the “attribute only” concept statement in a more concrete and deliberate manner.

Lastly, H4 was not supported when purchase probability was used. This is likely due to information being lost by the dichotomization of the purchase intention measure. The difference between findings when using the full scale vs. the dichotomized scale is important given the reliance on that measure by market research industry practitioners.

Study 5

As previously stated, product managers frequently test product concept statements that include both attribute and benefit information. Thus, the objective of Study 5 is to examine propositions from H5 regarding how the inclusion of both types of information in a concept statement influences consumers’ information processing and preferences for product concepts. Another purpose of Study 5 was to replicate the results of Study 4 regarding interaction effect of presentation format and age using a different product category (i.e., health monitor product). Lastly, a conditional process model tests whether the indirect effect of age differences on
purchase intention is moderated by the concept testing design factors of information type and presentation format.

Design

The design was a 2 (respondent selection: younger vs. older) x 2 (information type: attribute vs. attribute + benefit) x 2 (presentation format: no image vs. image) between-subjects study. Subjects in both age groups were randomly assigned to one of four conditions: (1) an attribute only concept statement without image, (2) an attribute only concept statement with image, (3) a both attribute and benefit concept statement without image, or (4) a both attribute and benefit concept statement with image (see Appendix E).

Subjects and Procedure

By following the previous screening procedures, 117 younger subjects (67 males, age range = 20-30, M = 26.15) and 106 older subjects (40 males, age range = 55-77, M = 60.44) were recruited via MTurk. Before evaluating the product concept, subjects indicated their levels of the product category involvement and expertise using the same questions from previously described studies. After reading the concept statement, subjects responded to the question: “Does the concept description above place more emphasis on attributes of the product or the benefits that users would receive from using the product?”, using a 9-point scale (1 = much more emphasis on attribute, 5 = equal emphasis on both, 9 = much more emphasis on benefits). Furthermore, subjects answered the same consumption vision measure from Study 4 as a manipulation check for the presentation format manipulation. Lastly, subjects responded to the same attitude, purchase intention and diagnostic questions as used in previous studies.
Analysis and Results

Control variables. One-way ANOVAs on product involvement ($\alpha = .96; M_{\text{younger}} = 2.98$ vs. $M_{\text{older}} = 3.18, F(1, 221) = 1.57, \text{NS}$), subjective expertise ($\alpha = .93; M_{\text{younger}} = 2.63$ vs. $M_{\text{older}} = 2.50, F(1, 221) = 1.02, \text{NS}$), and objective expertise ($\alpha = .90; M_{\text{younger}} = 2.08$ vs. $M_{\text{older}} = 1.97, F(1, 221) = .57, \text{NS}$) revealed no differences between younger and older respondents.

Manipulation check. First, subjects perceived the “attribute only” concept statement as placing more emphasis on attributes than did the “attribute and benefit” concept statement. As expected, an ANOVA analysis revealed a significant difference for the two information types ($M_{\text{attribute only}} = 3.80$ vs. $M_{\text{both attribute and benefit}} = 5.96, F(1, 221) = 56.22, p < .01$). Next, separate ANOVA tests were performed to rule out the possibility that the addition of benefit information might have influenced the manipulation of presentation format. As predicted, when attribute only concept statement was presented, subjects in the “image” condition ($M_{\text{image}} = 3.73$) showed higher levels of consumption vision than subjects in the “no image” condition ($M_{\text{no image}} = 3.47; F(1, 113) = 2.66, p < .05$). However, when the “attribute and benefit” concept statement was presented, there was no significant difference between the two conditions ($M_{\text{no image}} = 3.69$ vs $M_{\text{image}} = 3.72; F(1, 106) = .03, \text{NS}$). This suggests that including either an image or benefit information increased consumption vision, but their effects were not additive.

Moderated moderated mediation analyses. As previously mentioned, although no formal three-way interaction hypothesis was proposed, a conditional process model (see Figure 9) was tested using the PROCESS macro Model for SPSS with 5,000 bootstrapping samples (Hayes 2013). In this model, age difference was entered as the predictor variable for attitude with its effects being moderated by its interactions between information type and presentation format. Once again, attitude was predicted to mediate the effects on purchase intention. The index of
moderated moderated mediation revealed that the mediation model was not significant ($\beta = -0.35$, 95% CI [-1.0479, 0.3298]). Moreover, the three-way interaction effect on attitude toward the product concept was also not significant ($\beta = -0.37$, 95% CI [-1.0914, 0.3612]. Thus, these results did not support a three-way interaction effect of age x information type x presentation format on attitude and purchase intention toward the product concept.

Additive moderated mediation analyses. H4a and H5a predict that information type and presentation format independently moderate the relationship between the age and attitude. To simultaneously test for the effects of both variables in a parsimonious way, an additive moderated mediation model was estimated (PROCESS, model 9; Hayes 2013, number of bootstrap sample = 5,000). Results indicate a conditional significant effect of age on purchase intention via attitude with significant interaction terms for both age x information type ($\beta = 0.43$, $p < .05$, 95% CI [0.0656, 0.7953]) and age x presentation format ($\beta = 0.41$, $p < .05$, 95% CI [0.0449, 0.7743]). Furthermore, simple slope analysis (see Figure 10) showed that when older subjects evaluated the concept statement, the effect of adding benefit information on attitude was not significant ($\beta = 0.16$, 95% CI [-0.1058, 0.4263]). However, when younger subjects evaluated the statement, the effect was significant in a negative direction ($\beta = -0.28$, 95% [-0.5295, -0.0226]). Thus, H5a was not supported. In contrast, simple slope analysis for the presentation format (see Figure 11) revealed that the effect of adding images on attitude was significant for older subjects ($\beta = 0.28$, 95% CI [0.0104, 0.543]), but not for younger subjects ($\beta = -0.14$, 95% CI [-0.3983, 0.1089]). This result replicates the results of Study 4 and provides further support for H4a.

Hayes’s (2017) index of partial moderated mediation ($\beta = 0.41$, 95% CI [0.0643, 0.7615]) indicates that moderated mediation effect of information type was statistically significant. This
shows that the moderating effect of information type is independent of the effects for presentation format. Similarly, the index of partial moderated mediation for presentation format is significant ($\beta = .39, 95\% \text{ CI} [0.0499, 0.7397]$) and independent of the moderating effect of information type. The conditional indirect analysis revealed that the indirect effect of age differences on purchase intention through attitude was significant only when “attribute and benefit” statements were presented with images ($b = .60, 95\% \text{ CI} [0.2930, 0.9264]$). Therefore, H5b was supported.

In addition, a reanalysis of H5a was conducted using only subjects from the “no image” condition. My question was whether the non-significant result found among older adults may be due to the fact that the visual images in the “attribute only” concept statement influenced their construal levels as previously found in Study 4. The simple slope analysis (see Figure 12) showed that the effect of adding benefit information on attitude toward the product concept was significant for older adults ($\beta = .42, 95\% \text{ CI} [0.0489, 0.7896]$), but not for younger adults ($\beta = -.19, 95\% \text{ CI} [-0.5499, 0.1669]$), when visual images were not presented. This provides a partial support for H5a.

Lastly, the same conditional indirect analysis revealed that the indirect effect of age differences on purchase probability via attitude was significant only when “attribute and benefit” statements were presented with images ($b = .60, 95\% \text{ CI} [0.2962, 0.9415]$). Thus, H5b was supported.

Discussion

In sum, the moderated moderated mediation analysis did not reveal a significant three-way interaction of age x information type x presentation format. However, subsequent modeling
for H4a, H5a, and H5b finds that as age increases 1) the improvement of adding benefit information on attitude toward the product concept increases, 2) the improvement of adding images on attitude toward the product concept also increases, and 3) the positive influence of both of these interactions on purchase intention is mediated by attitude toward the product concept. Interestingly, H5a was supported only when the “no image” condition data was used. This suggests that the visual images in “attribute only” concept statement helped older respondents process the information more concretely. These findings will be discussed in more detail in the General Discussion.
CHAPTER 6
GENERAL DISCUSSION

New product concept testing is widely recognized as a flawed yet essential tool in the NPD process. Ideally, concept testing evaluations should only reflect inherent characteristics of the product concept. In practice, there are a wide variety of research design decisions across different types of product categories, target markets and stages in the NPD process that influence concept testing results. The influence of these factors is largely unknown, so unaccounted forces influence managers’ decisions to drop, invest and launch new products rather than the merits of the new product concept. Although the inaccuracy of new product forecasting is well known, managers continue to invest time and money into the process. In essence, concept testing remains an import tool because it improves new product success despite all of its faults. The implication is that improvements in either the conduct or interpretation of concept testing have the potential to strongly influence new product success.

Although prior studies examine the effects of research design decisions on concept testing results, how these decisions interact to influence concept test results has received little attention. In addition, much of prior concept testing research has been phenomenological rather theoretical, so little is known about why these effects are found and how they can be managed.

Across five studies, this research highlights conditions under which product concept testing design decisions influence test results. I will briefly outline contributions this research provides for both the conduct of better concept testing practices in the field and the advancement of more useful theory in marketing.
Implications for Practice

Consistent with Kurt Lewin (1951) famously writing there is nothing as practical as a good theory, this research uses a powerful theoretical paradigm (CLT) to help product managers identify design decisions in concept testing that can unintentionally influence the acceptance and rejection of product concepts with different target audiences. In Study 1, I found that older and younger respondents process attribute and benefit information differently. More specifically, the results showed that younger subjects responded more positively to product concepts depicted with attribute rather than benefit information. It is important to note that the concept themselves were the same, but younger subjects responded significantly less favorably when attributes were translated into benefits. In an actual concept testing scenario, this might have resulted in the concept being rejected due to younger audiences preferring attribute information, regardless of the product concept’s merits. Therefore, product managers need to understand how characteristics of the target market interact with their concept statement design decision to influence respondents’ purchase intentions. In essence, this study demonstrates how concept test data can mislead product managers to either retain or reject new product ideas regardless of their actual characteristics.

In Study 3, I draw on CLT to explain challenges older respondents face when evaluating “attribute only” concept statements. More specifically, I used a simple priming task to help older respondents provide more useful product design feedback. The results showed that a concrete mindset prime improved “consumption vision” and attitude toward the “attribute only” product concept when older respondents assessed the concept statement. However, because younger respondents already prefer more concrete product information, the prime did not affect their attitude. In addition, the moderated mediation analysis revealed that the interactive influenced of
age and mindset through attitude to purchase intention supports for H3b. In particular, it is noteworthy that increased age along with a concrete mindset resulted in the highest attitude and purchase intention. This result is consistent with previous CLT findings that preferences for a particular type of information (i.e., attribute information) can change when situational cues prime people to alter their preferred construal levels (Trope and Liberman 2010).

Particular attention should be given to CLT’s usefulness as a tool for identifying and resolving practical problems facing new product managers. As previously discussed, in practice, new product managers may or may not include visual images of the product concept in concept statements depending upon the product development stage. Thus, in Study 4, I examined whether the addition or removal of visual images changes respondents’ preferred construal levels. Specifically, that the inclusion of images in a product concept statement appears to have promoted more detailed or concrete processing of attribute information for older respondents. The results indicated that the inclusion of image increased older adults’ purchase intention by improving attitude toward the “attribute only” concept statement.

The combined results from these two studies suggest that when product managers conduct “attribute only” product concept tests with older adults, they should consider the inclusion of design factors that promote more concrete processing style by using external cues. More specifically, product managers can nudge older respondents to engage in more detailed processing of attribute information by providing visual images of the product concept or by having subjects engage in a concrete processing priming task.
Implications for Theory

This research contributes to recent work on the effect of age differences on construal level (Hong and Lee 2010). Hong and Lee (2010) concluded that there is a positive correlation between age and chronic construal level. Their finding is consistent with my own results demonstrating that as people age chronic construal levels (i.e., BIF scores) increase. Whereas this prior research examined a linear relationship between age and construal level, my work extends this literature by finding that chronic construal levels increase at a moderate rate throughout adulthood until approximately 60 years of age when the changes begin to dramatically increase.

Marketing theorists have clearly demonstrated that matching the language in marketing stimuli to consumers’ preferred construal level positively influences persuasion. As previously discussed, a host of different researchers examining different types of issues over the past 20 years have replicated these effects. While the phenomena itself is well established in many academic literatures, the process by which it occurs is less well understood. In particular, a number of recent marketing articles have examined CLT and its implications for understanding how attribute and benefit information influence preferences (Ding and Keh 2017; Lambert and Dieh 2013; Wang and Cole 2015). These studies typically provide either attribute or benefit information and examine how these different types of information interact with subjects’ construal levels to influence preference.

Although this research provides interesting and useful insights, it is also based on the somewhat artificial assumption that consumers do not simultaneously interact with attribute and benefit information to understand marketing stimuli. For example, when buying a car, the attribute gas mileage is linked to the benefit saving money. A pillow containing down feathers is
linked the benefit comfort. When a television commercial claims that its pillow is the most comfortable, consumers immediately wonder what attributes it possesses to support that claim. In fact, benefits often seem vague or unbelievable without their associated attributes. On the other hand, attribute information is understandable, but potentially not persuasive without its associated benefits. As attributes become more complex or less well understood, consumers are less likely to infer benefits from these attributes unless these benefits are expressly communicated (e.g., various benefits associated with the attributes of computer security software).

As previously discussed, later in the NPD process, product managers typically depict product concepts with both attribute and benefit information. Thus, in Study 5, I investigated how younger and older respondents process a concept statement differently when both types of information are presented. This is the first consumer research application of CLT theory that explores the natural context where attribute and benefit information are simultaneously presented to customers. Although there was a significant interaction effect between age and information type on attitude toward the product concept, the results revealed that the attitude was negatively influenced by the addition of benefit information when younger respondents evaluated the concept statement. This result is unexpected and may be due to the fact the tested concept statements included both “no image” and “image” conditions. As discussed in the results section, the hypothesized effect was found among subjects who evaluated the “no image” condition. Namely, the inclusion of benefit information had no significant effect on attitude among younger subjects, but did have a significant positive effect among older subjects. Thus, the simultaneous presence of attribute and benefit information seemed to create an unknown and negative effect only among younger subjects. This might be due to younger people not agreeing with the implied
link between the provided benefits and attributes. Alternatively, younger subjects might consider the benefit information superfluous and deterring in a negative manner from the attribute description.

Limitations and Future Research

The findings in this research suggest that information processing cues both external to concept statements and embedded within concept statements can significantly influence respondents’ attitude and purchase intention toward a product concept. I believe other types of cues, such as testing platform cues (i.e., online vs. paper), will also produce similarly systematic effects.

Regarding testing platforms, product concept testing is increasingly moving from face-to-face offline interactions with moderators using printed materials to online interactions where respondents see concepts on computer screens and respond through their keyboards. The present research was conducted online, but offline testing remains very common. Thus, a more pressing present issue involves potential differences in online concept testing versus traditional testing completed in a face-to-face platforms using paper and pencil questionnaires. While all types of online market research have increased, face-to-face research conducted in focus group facilities remains an important tool in concept testing. In this setting, eight to ten research participants typically evaluate concept statements printed on paper or card stock and answer a brief questionnaire. A moderator then leads a brief discussion regarding the product concepts strengths, weakness and ideas for improvement. The fact that offline concept testing remains a common research technique underscores the importance of a growing literature regarding the effects of online and offline platforms for presenting information. Specifically, online...
information processing seems to enable detailed processing that enhances understanding of
details and facts while offline processing promotes increased understanding of abstract ideas and
their broader implications (Kaufman and Flanagan 2016).

Kaufman and Flanagan’s (2016) recent human-computer interaction (HCI) research
draws on CLT to propose that online (or digital) platforms, such as tablets, laptops, and
smartphones, dispose readers to focus excessively on concrete details in online information
rather than abstractly interpreting the information. According to Kaufman and Flanagan (2016),
there are several explanations for why online platforms hamper individuals’ abstract thinking.
They argue that excessive Internet or digital technology usage affects neural networks associated
with working memory and rapid decision making. In fact, in a neuroscience study, Small et al.
(2009) compare experienced Internet-savvy users with Internet-naïve users, who were exposed to
the Internet for five days for the first time. They find significant changes in areas of the brain
which are involved in short-term memory and rapid decision-making among the naive group.
Kaufman and Flanagan (2016) suggest that information processing habits, such as quick
scanning and skimming, and the ever-increasing demands of multitasking and divided attention
in online environments reduces abstract thinking abilities. I believe these inherent differences in
information processing are likely to interact with alternative information presentation formats
and age differences in concept tests to influence how respondents evaluate concepts and answer
purchase intention questions. Thus, given the importance of both testing platform and age in
concept testing, it would be interesting to examine how different types of testing platform could
be a significant predictor of younger and older respondents’ attitude and purchase intention
toward product concepts.
Similar to the current transition from offline to online, experts anticipate virtual reality becoming the norm in future concept testing. Although Peng, He, and Wan (2011) suggest that virtual reality concept testing can more effectively integrate words with visuals to provide more realistic concept testing platforms, the effects of virtual reality platforms on concept testing results have received less research attention than other types of research design decisions. In fact, virtual reality testing is likely to increase in popularity because it allows product managers to test concepts without investing to build actual products (Dahan and Hauser 2002). Moreover, greater realism in concept testing more closely matches actual purchasing environment and thereby increases predictive validity Although there is evidence that presenting concepts in virtual reality provides a more valid test than traditional using online concept statements (Dahan and Srinivasan, 2000; Von Hippel and Katz, 2002), there is also research concluding that traditional online concept testing and virtual testing environment yield identical evaluation results (Peng, He, and Wan 2011).

Another limitation of this research is the use of only one image in Study 4 and Study 5. For example, the image used in concept statements in Study 4 shows how the home security product can monitor intruders. Although the image was included in the concept statements to help respondents process attribute information better by thinking more concretely, it is plausible that it might make people feel fear, which, in turn, lead to effortful or detailed processing of the information. In other words, the results of the study may be subject to a number of unaccounted factors, besides the inclusion of image itself. Thus, future research could be improved by using multiple images in concept statements.

Future research should also explain the underlying mechanism of how attitudes are influenced by different types of concept testing design decisions. The results of studies 4 and 5
suggest that a successful priming process (i.e., images) facilitates older respondents being better able to process the attribute information. This is supported by finding significant improvement in subjects’ consumption vision. I believe these primes will also result in improved recall of attribute information, improved perceptions regarding the utility of this information and heightened purchase intentions for the product concept. Thus, future studies exploring the potential underlying mechanism would improve our understanding of how older respondents process information in concept testing.

Lastly, a well know limitation in the use of MTurk data is that this data is not representative of the U.S. population. Previous research finds that a majority of MTurk respondents are a relatively homogenous groups of individuals with a majority being white, middle-aged and socioeconomically disadvantaged (Huff and Tingley 2015; Paolacci and Chandler 2014). Others find that older MTurk workers tend to be college educated, more tech-savvy than many other older adults and may differ on other important characteristics (Patrick, Nehrkorn, and Carney (2016). The present research randomly assigned subjects to experimental treatments across two age groups. Therefore, my results are less likely to be biased by characteristics inherent to MTurk samples. Nonetheless, additional research using participants from a more representative (i.e., older) population should explore the robustness of the present results. This particular type of bias is important given the tremendous growth and reliance by practitioners on Internet based marketing research.

In conclusion, my research provides seeds for multiple research opportunities that I hope to examine upon completion of this dissertation. I also believe these dissertation findings provide an interesting application for CLT in a research domain (i.e., concept testing) that is important
and under researched. Therefore, my hope is that the present research spurs additional researchers to apply alternative theoretical perspectives to improve concept testing validity.
<table>
<thead>
<tr>
<th>Authors (Year)</th>
<th>Factors Being Studied</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bengston and Brenner (1964)</td>
<td>Presentation format (real product): (side by side vs. staggered vs. monadic)</td>
<td>Each technique has its place. Side by side most sensitive but most artificial; staggered is a comprise; monadic close to real life but insensitive</td>
</tr>
<tr>
<td>Armstrong and Overton (1971)</td>
<td>Presentation format (brief vs. comprehensive description)</td>
<td>The extent and type of description did not seem to have an appreciable influence upon the results; The brief description proved to be much superior because of its low cost</td>
</tr>
<tr>
<td>Haley and Gatty (1971)</td>
<td>Executions (concept by copywriter: 8 different concepts by 3 copywriters)</td>
<td>Consumer reaction is based not only on the concept and the copywriter but on the interaction between positioning and copywriter</td>
</tr>
<tr>
<td>Hughes and Guerrero (1971)</td>
<td>Source of info (social vs. neutral vs. commercial); Copy themes (ratings of 20 vs. 50 vs. 80) X Product dimensions (comfort vs. safety vs. social acceptability)</td>
<td>Significant effects for the elements of source, theme and product dimension; Significant interactions for sources-themes, theme-dimensions; The theme of message (concepts) is the dominating influence in this experiment</td>
</tr>
<tr>
<td>Tauber (1972)</td>
<td>Presentation format (a proto-typical print ad with pictorial stimuli vs. a factual written description)</td>
<td>Scores (overall attitude and intention to buy) were much higher for the print ad than the paragraphs but the relative scores did not change</td>
</tr>
<tr>
<td>Wolpert (1980)</td>
<td>Respondent selection (common car buyers vs. nonfunctional show type styling buyers)</td>
<td>Common car buyers prefer a conservative functional styling with little change, whereas nonfunctional show type styling buyers may be able to give valid predictions of the acceptance of revolutionary change in styling</td>
</tr>
<tr>
<td>Holbrook and Moore (1981)</td>
<td>Presentation format (schematic pictorial presentations vs. verbal descriptions)</td>
<td>Pictures evoked significantly more main effects than did words; No significant difference in the number of attribute interactions was found</td>
</tr>
<tr>
<td>Smead et al. (1981)</td>
<td>Presentation format (actual products vs. verbal presentations)</td>
<td>Choices from verbal presentations were perceived to be easier than choices form actual products; Actual products elicited more scan behavior (eye movements) differences in the determinant attributes between two modes</td>
</tr>
</tbody>
</table>
Table 1 – continued

<table>
<thead>
<tr>
<th>Authors (Year)</th>
<th>Factors Being Studied</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilton and Pessemier</td>
<td>Respondent selection: the amount and importance of the information given to consumers (low vs. intermediate vs. maximum level); purchase context (low vs. high risk)</td>
<td>Increased levels of information have an effect on the predicted market share of an electric car; Information levels have a significant effect on perceptions and preferences for the products</td>
</tr>
<tr>
<td>(1981)</td>
<td></td>
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<tr>
<td>Moore and Holbrook</td>
<td>Presentation format (real product vs. concepts)</td>
<td>The shift from real objects to new concepts is accompanied by a dramatic decline in predictive efficacy in both joint space models and conjoint analysis</td>
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<tr>
<td>(1982)</td>
<td></td>
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<tr>
<td>Trebbi and Flesch</td>
<td>Presentation format: the number of concepts being tested (monadic vs. multiple)</td>
<td>Concepts were rated significantly lower in the multiple treatment in terms of the evaluative variable (purchase likelihood)</td>
</tr>
<tr>
<td>(1983)</td>
<td></td>
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<tr>
<td>Lewis (1984)</td>
<td>Testing method (product trial vs. without)</td>
<td>Concept tests with product placement results in higher positive interest in concepts; Consumers respond to the method rather than the message</td>
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<tr>
<td>Reidenbach and Grimes</td>
<td>Presentation format (written vs. verbal vs. video) X Respondent selection (high vs. low knowledge); Product type (continuous vs. discontinuous innovation)</td>
<td>High knowledge groups evaluate concepts differently than low knowledge groups; This differential impact is conditioned by the type of concept being evaluated and the form by which the concept is presented</td>
</tr>
<tr>
<td>(1984)</td>
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<tr>
<td>Domzal and Unger</td>
<td>Presentation format (schematic vs. verbal) X Features (leather vs. metal band; round vs. square; digital vs. analog function)</td>
<td>No significant differences in the number of significant main attribute effects; Pictorial presentation of stimuli generated significantly fewer interaction effects than did verbal presentation</td>
</tr>
<tr>
<td>(1985)</td>
<td></td>
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<tr>
<td>Anderson (1987)</td>
<td>Presentation format (actual products; actual products with verbal descriptions vs. verbal descriptions only)</td>
<td>Obtained the highest fit ($R^2$) values under verbal descriptions only followed by actual products</td>
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<td></td>
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<tr>
<td>Louviere et al.</td>
<td>Presentation format (verbal descriptions vs. partial realistic presentations)</td>
<td>Few differences in part-worths between representation modes</td>
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<tr>
<td>(1987)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authors (Year)</td>
<td>Factors Being Studied</td>
<td>Findings</td>
</tr>
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<tr>
<td>Miller et al. (1987)</td>
<td>Presentation format (no competitive-set information vs. competitive-set information provided 4 price levels)</td>
<td>The provision of competitive-set information does induce higher purchase intentions, but not significant</td>
</tr>
<tr>
<td>Schoormans et al. (1995)</td>
<td>Respondent selection (low vs. moderate vs. high expertise)</td>
<td>High expertise consumers show more similarity between concept evaluation and the evaluation of the real product than consumers with little or moderate product category expertise, produce more consistent and more stable evaluations over time</td>
</tr>
<tr>
<td>Dickinson and Wilby (1997)</td>
<td>Testing method (product trial vs. without) X Presentation format (positioning: taste vs. gentleness vs. all natural ingredients)</td>
<td>No significant interaction effects between testing method and presentation format; Main effects of each factor are significant</td>
</tr>
<tr>
<td>Vriens et al. (1998)</td>
<td>Presentation format (verbal vs. realistic pictorial)</td>
<td>The pictorial presentations improved the respondent’ understanding of the design attributes, while the verbal presentations seems facilitate judgment</td>
</tr>
<tr>
<td>Dahan and Srinivasan (2000)</td>
<td>Presentation format (attribute-only, full profile vs. Web static visual vs. web virtual animation vs. physical prototype)</td>
<td>Virtual prototypes on the Web provide nearly the same market share predictions as physical prototypes</td>
</tr>
<tr>
<td>Dahan and Hauser (2002)</td>
<td>Testing method (virtual vs. traditional online testing environment)</td>
<td>Online testing environments are cost efficient, whereas virtual testing environments encourage a greater number of concepts to be explored and tested with customers</td>
</tr>
<tr>
<td>Kristensson et al. (2004)</td>
<td>Respondent selection (product development professionals vs. advanced users vs. ordinary users)</td>
<td>Ordinary users generate ideas that an independent panel judges as being more original and more valuable than the other two groups; Advanced users and product development professionals develop ideas that are more realizable – more easily developed into actual products</td>
</tr>
<tr>
<td>Dahl and Hoeffler (2004)</td>
<td>Presentation format (self-related images vs. others-related images)</td>
<td>For incremental (radically) new products, visualizing with self-related (other-related) images led to higher evaluations</td>
</tr>
<tr>
<td>Authors (Year)</td>
<td>Factors Being Studied</td>
<td>Findings</td>
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<tr>
<td>Lees and Wright (2004)</td>
<td>Presentation format (stripped vs. embellished vs. visual)</td>
<td>Respondents’ answers to attitude and purchase intention questions showed only minor variation with different formulations; The ranking showed no substantial changes</td>
</tr>
<tr>
<td>Creusen and Schoormans (2005)</td>
<td>Presentation format (product appearance role: have aesthetic and symbolic value vs. communicate functional characteristics; provide a quality impression vs. communicate ease of use vs. draw attention vs. influence the ease of product categorization</td>
<td>Most subjects mentioned two different ways in which appearance influenced their product choice; The aesthetic and symbolic roles were mentioned most often</td>
</tr>
<tr>
<td>Ziamou and Veryzer (2005)</td>
<td>Testing method (temporal distance: tomorrow vs. a year from now; introduce in a few months vs. currently available)</td>
<td>The functionality of the product is valued more in distant future events while the interface of the product is more important in the near future</td>
</tr>
<tr>
<td>Klink and Athaide (2006)</td>
<td>Respondent selection (early adopters vs. later adopters)</td>
<td>For later adopters, using affective questions and incorporating more product-related information and repeat exposure are effective</td>
</tr>
<tr>
<td>Zhao, Hoeffler, and Dahl (2009)</td>
<td>Presentation format (imagination-focused visualization vs. memory-focused visualization)</td>
<td>An imaginative focus leads to higher evaluations of really new products, but has no effect on the evaluation of incrementally new products</td>
</tr>
<tr>
<td>Hoffman, Kopalle, and Novak (2010)</td>
<td>Respondent selection (high in emergent nature consumers vs. lead users vs. innovative consumers)</td>
<td>Consumers high in emergent nature are able to develop product concepts that mainstream consumers find significantly more appealing and useful than concepts developed by typical, lead user, or even innovative consumers</td>
</tr>
<tr>
<td>Peng and Finn (2010)</td>
<td>Respondent selection (consumer innovativeness: high vs. low; change seeking: high vs. low)</td>
<td>Respondent characteristics (innovativeness and change seeking) influence concept evaluations</td>
</tr>
<tr>
<td>Authors (Year)</td>
<td>Factors Being Studied</td>
<td>Findings</td>
</tr>
<tr>
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</tr>
<tr>
<td>Ozer (2011)</td>
<td>Respondent selection (prior experience: high vs. low; level of importance: high vs. low)</td>
<td>Respondents’ prior experience moderates the relationship between behavioral intentions and actual behaviors in a way that the relationship is stronger when prior experience is high (vs. low); The level of importance moderates the same relationship such that the relationship is stronger when behavioral importance is high (vs. low)</td>
</tr>
<tr>
<td>Peng, He, and Wan (2011)</td>
<td>Testing method (traditional vs. virtual testing environment)</td>
<td>Both testing environments yield identical mean scores, while the virtual testing provides higher-quality data given the same sampling design</td>
</tr>
<tr>
<td>Peng, Cui, and Li (2012)</td>
<td>Testing method (traditional vs. virtual testing environment) X Respondent selection (consumer innovativeness: high vs. low; change seeking: high vs. low)</td>
<td>Respondents with high innovativeness and change seeking report significantly more favorable concept evaluations; However, the effect of innovativeness on testing outcomes was reduced in virtual testing environment</td>
</tr>
<tr>
<td>Van den Hende et al. (2012)</td>
<td>Testing method (reader-protagonist similarity: similar vs. dissimilar) X Presentation format (narrative vs. attribute/benefit listings)</td>
<td>Respondents who share matching characteristics with a protagonist are more likely to transport into the narrative and to develop more favorable product evaluations</td>
</tr>
<tr>
<td>Cassia et al. (2015)</td>
<td>Presentation format (positioning: service-based vs. good-based)</td>
<td>Presenting the concepts as service-based (vs. good-based) can enhance customer perceived value, but only if customers are not familiar with the product</td>
</tr>
<tr>
<td>Schweitzer and Hende (2017)</td>
<td>Presentation format (story vs. list)</td>
<td>Concept presentations in story format stimulate transportation into really new products more than a concept presentation in a list format</td>
</tr>
</tbody>
</table>
Table 2. The Behavior Identification Form Measures

1. Making a list
   a. Getting organized\(^a\)
   b. Writing things down
2. Reading
   a. Following lines of print
   b. Gaining knowledge\(^a\)
3. Joining the Army
   a. Helping the Nation’s defense\(^a\)
   b. Signing up
4. Washing clothes
   a. Removing odors from clothes\(^a\)
   b. Putting clothes into the machine
5. Picking an apple
   a. Getting something to eat\(^a\)
   b. Pulling an apple off a branch
6. Chopping down a tree
   a. Wielding an axe
   b. Getting firewood\(^a\)
7. Measuring a room for carpeting
   a. Getting ready to remodel\(^a\)
   b. Using a yardstick
8. Cleaning the house
   a. Showing one’s cleanliness\(^a\)
   b. Vacuuming the floor
9. Painting a room
   a. Applying brush strokes
   b. Making the room look fresh\(^a\)
10. Paying the rent
    a. Maintaining a place to live\(^a\)
    b. Writing a check
11. Caring for houseplants
    a. Watering plants
    b. Making the room look nice\(^a\)
12. Locking a door
    a. Putting a key in the lock
    b. Securing the house\(^a\)
13. Voting
    a. Influencing the election\(^a\)
    b. Making a ballot
14. Climbing a tree
    a. Getting a good view\(^a\)
    b. Holding on to branches
15. Filling out a personality test
    a. Answering questions
    b. Revealing what you’re like\(^a\)
16. Toothbrushing
    a. Preventing tooth decay\(^a\)
    b. Moving a brush around in one’s mouth
17. Taking a test
    a. Answering questions
    b. Showing one’s knowledge\(^a\)
18. Greeting someone
    a. Saying hello
    b. Showing friendliness\(^a\)
19. Resisting temptation
    a. Saying “no”
    b. Showing moral courage\(^a\)
20. Eating
    a. Getting nutrition\(^a\)
    b. Chewing and swallowing
21. Growing a garden
    a. Planting seeds
    b. Getting fresh vegetables\(^a\)
22. Traveling by car
    a. Following a map
    b. Seeing countryside\(^a\)
23. Having a cavity filled
    a. Protecting your teeth\(^a\)
    b. Going to the dentist
24. Talking to a child
    a. Teaching a child something\(^a\)
    b. Using simple words
25. Pushing a doorbell
    a. Moving a finger
    b. Seeing if someone’s home\(^a\)

\(^a\) Higher-level alternative.
Table 3. Summary Statistics of Product Involvement and Expertise (Study 3)

<table>
<thead>
<tr>
<th></th>
<th>Pain Reliever</th>
<th>Water Bottle</th>
<th>Home Security</th>
<th>Health Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Involvement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young</td>
<td>3.68 (.93)</td>
<td>3.54 (1.21)</td>
<td>3.59 (1.21)</td>
<td>3.02 (1.31)</td>
</tr>
<tr>
<td>Old</td>
<td>4.07 (.99)</td>
<td>3.15 (1.48)</td>
<td>3.25 (1.42)</td>
<td>2.98 (1.37)</td>
</tr>
<tr>
<td>Total</td>
<td>3.87 (.98)</td>
<td>3.35 (1.36)</td>
<td>3.42 (1.32)</td>
<td>3.00 (1.33)</td>
</tr>
<tr>
<td>Subjective Expertise</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young</td>
<td>3.31 (.97)</td>
<td>3.25 (.99)</td>
<td>2.63 (1.11)</td>
<td>2.53 (1.00)</td>
</tr>
<tr>
<td>Old</td>
<td>3.65 (.93)</td>
<td>2.87 (1.07)</td>
<td>2.61 (1.13)</td>
<td>2.32 (1.02)</td>
</tr>
<tr>
<td>Total</td>
<td>3.48 (.96)</td>
<td>3.06 (1.04)</td>
<td>2.62 (1.11)</td>
<td>2.42 (1.01)</td>
</tr>
<tr>
<td>Objective Expertise</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young</td>
<td>2.94 (1.12)</td>
<td>3.36 (.99)</td>
<td>2.34 (1.15)</td>
<td>2.10 (1.09)</td>
</tr>
<tr>
<td>Old</td>
<td>3.12 (1.07)</td>
<td>2.92 (1.11)</td>
<td>2.05 (1.11)</td>
<td>1.80 (1.02)</td>
</tr>
<tr>
<td>Total</td>
<td>3.03 (1.09)</td>
<td>3.14 (1.07)</td>
<td>2.19 (1.14)</td>
<td>1.95 (1.06)</td>
</tr>
</tbody>
</table>

* Standard deviations are in parentheses.
Figure 1. Conceptual Model of Study 3

- Age (Younger vs. Older)
- Information Type (Attribute vs. Benefit)
- Attitude
- Purchase Intention

Hypotheses:
- H1a
- H1b
Figure 2. Conceptual Model of Study 3

- Age (Younger vs. Older)
- Mindset (Control vs. Concrete)
- Purchase Intention
- Attitude

[H3a]
[H3b]
Figure 3. Conceptual Model of Stdy 4

- **Age (Younger vs. Older)**
- **Presentation Format (No Image vs. Image)**
- **Attitude**
- **Purcha Intention**

[H4a] [H4b]
Figure 4. Conceptual Model of Study 5

Information Type
(Attribute only vs. Both Attribute and Benefit)

[H5a]

Age
(Younger vs. Older)

[H4a]

Attitude

[H5b]

Purchase Intention

Presentation Format
(No Image vs. Image)
Figure 5. Age x Information Type on Purchase Probability (Study 1)
Figure 6. Linear and Quadratic Effects of Age on BIF Scores (Study 2)
Figure 7. Mindset x Age on Attitudes (Study 3)
Figure 8. Presentation Format x Age on Attitudes (Study 4)
Figure 9. Study 4: Moderated Moderated Mediation Model: Model 11 (Study 5)
Figure 10. Information Type x Age on Attitudes (Study 5)
Figure 11. Presentation Format x Age on Attitudes (Study 5)
Figure 12. Information Type x Age on Attitudes: No Image condition only (Study 5)
Appendix A. Study1 Product Concept Stimuli

Attribute-based concept statement

BrushRight

*Brush your teeth the right way!*

- Three brushes simultaneously rotate to clean the top, front and back of tooth surfaces.
- Brush rotation speed and pressure on teeth are adjustable.
- Disinfecting UV LED light shines on brushes after each use.

Benefit-based concept statement

BrushRight

*Brush your teeth the right way!*

- Three brushes reduce dentist recommended brushing time from two minutes to 10-seconds.
- Brushing action changes from providing deep cleaning to gentle gum massage.
- Disinfection system eliminates unhealthy bacteria and viruses that normally reside in toothbrushes.
Appendix B. Study 2 Product Concept Stimuli

Pain reliever concept statement

**Penzal Liqui-Gels Minis**
- Fast Relief in a Smaller Size -

- 200 milligrams of fast-dissolving ibuprofen for headache, back, and muscle pain.
- Pills are 33% smaller than other pain relievers.
- Works in less than 10 minutes.
- Contains no red dye 40, gluten, aspirin, or caffeine.

Water bottle concept statement

**QUARTZ Bottle**
- The World's First Self-Cleansing Water Bottle -

- Disinfecting UV-C light activates every 4-hours to neutralize up to 99.9999% of germs.
- Rechargeable battery power lasts up to two months.
- Filters are permanent.
Home security concept statement

**Caps Home Security**
- The Future of Home Security -

- 95db alarm can be activated either automatically when door opens or by homeowners via Internet connected devices.
- 720p motion detecting cameras automatically live stream and record all home entrances.
- No contract or monthly fee required.

Health monitor concept statement

**H20 Power**
- The First Ever Activity Tracker with Hydration Monitoring -

- Infrared light in wristband measures real-time body hydration levels.
- Heart-rate tracker monitors exercise intensity.
- Counts steps, distance, floors climbed, and calories burned.
- Rechargeable battery power lasts 15 days.
Appendix C. Study 3 Product Concept Stimuli

“No Image” concept statement

![Caps Home Security - The Future of Home Security]

- 95db alarm can be activated either automatically when door opens or by homeowners via Internet connected devices.
- 720p motion detecting cameras automatically live stream and record all home entrances.
- No contract or monthly fee required.

“Image” concept statement

![Caps Home Security - The Future of Home Security]

- 95db alarm can be activated either automatically when door opens or by homeowners via Internet connected devices.
- 720p motion detecting cameras automatically live stream and record all home entrances.
- No contract or monthly fee required.
Appendix D. Manipulation Check Items

1. To what extent did the product concept description bring to mind concrete images or mental pictures of the product?
2. When thinking about using the product, how vivid or detailed was the image that came to your mind?
3. When thinking about the product, how easy was it to see yourself using the product?
4. While reading the product concept description, to what extent did you envision yourself using the product?
Appendix E. Study 4 Product Concept Stimuli

“Attribute Only” concept statement “Without Image”

<table>
<thead>
<tr>
<th>Hydro Max Tracker</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>- The First Ever Activity Tracker with Hydration Monitoring -</strong></td>
</tr>
</tbody>
</table>

- Infrared light sensor in wristband monitors real-time body hydration levels.
- Heart-rate tracker monitors exercise intensity.
- Counts steps, distance, floors climbed, and calories burned.

“Attribute Only” concept statement “With Image”

<table>
<thead>
<tr>
<th>Hydro Max Tracker</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>- The First Ever Activity Tracker with Hydration Monitoring -</strong></td>
</tr>
</tbody>
</table>

- Infrared light sensor in wristband monitors real-time body hydration levels.
- Heart-rate tracker monitors exercise intensity.
- Counts steps, distance, floors climbed, and calories burned.
“Both Attribute and Benefit” concept statement “Without Image”

**Hydro Max Tracker**
- The First Ever Activity Tracker with Hydration Monitoring -

- Infrared light sensor in wristband monitors real-time body hydration levels.
- Heart-rate tracker monitors exercise intensity.
- Counts steps, distance, floors climbed, and calories burned.
- Promotes appropriate hydration for improved mood and energy.
- Helps achieve maximum cardiovascular benefit from your exercise program.
- Helps you achieve and maintain ideal body weight.

“Both Attribute and Benefit” concept statement “With Image”

**Hydro Max Tracker**
- The First Ever Activity Tracker with Hydration Monitoring -

![Image of Hydro Max Tracker]

- Infrared light sensor in wristband monitors real-time body hydration levels.
- Heart-rate tracker monitors exercise intensity.
- Counts steps, distance, floors climbed, and calories burned.
- Promotes appropriate hydration for improved mood and energy.
- Helps achieve maximum cardiovascular benefit from your exercise program.
- Helps you achieve and maintain ideal body weight.
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