

Abstract

ROSENBERG, DANIEL CROWN. The Effects of Affective Priming and Aging on Ratings, Thoughts, and Recall for Advertisements. (Under the direction of Thomas M. Hess.)

The purpose of this study was to investigate age differences in the influence of irrelevant affective information on consumer judgments. Celebrity endorsement of a product in a print advertisement played the role of the irrelevant affective information (i.e., the affective primes). Due to age-related declines in cognitive efficiency and the self-initiation of controlled cognitive processing, older adults were expected to engage in less elaboration and show more susceptibility to the irrelevant affective information when compared to younger adults. Thirty-six young and 35 older adults viewed two advertisements for each of three product types (total of six ads), rated their purchase intent, provided attitude ratings and thoughts, and free-recalled the ads' content. For each product type, one ad had a nonfamous endorser while the competing ad had a famous endorser of varying likability (high, neutral, or low).

Older adults produced more relevant thoughts about the advertisements than did the younger adults. As expected, purchase intent was not affected by the manipulation. Advertisements with the negative prime received significantly lower ratings than did advertisements with the positive and neutral primes; however, there were no age differences in priming effects for the attitude ratings. Famous endorsement boosted advertisement recall, especially for younger adults. Both age groups recalled more relevant than irrelevant information, but this difference was greater for the younger adults. Older adults recalled proportionally more irrelevant information than did the younger adults.

Although older adults seem more susceptible than do younger adults to task irrelevant information when retrieving facts from long-term memory, in certain contexts they may focus more than the younger adults do on relevant information in the short-term. Thus, conscious mental processing may be a stronger influence than more automatic mechanisms when motivation is high enough.

**THE EFFECTS OF AFFECTIVE PRIMING AND AGING ON RATINGS,
THOUGHTS, AND RECALL FOR ADVERTISEMENTS**

by
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Dedication

This work is dedicated to my family for their unending encouragement, support, and guidance:

Ruth Rosenberg

George and Ruth Rosenberg

Alice Lieberman

Sylvia and Chris Nolde

Jeff and Anita Rosenberg

Stephen Rosenberg

to those members of my family who are no longer with us, yet provide me with the inspiration to succeed:

Myer Lieberman

Laurence Rosenberg

David and Sadie Rosenberg

Stephen Jay Gould

and to my friends both past and present who make life worth living, especially:

Toni K. Durao, A. “Shawn” Aghdam, Birgit Starmanns, Tim and Mary Price, Fatos Simsek, Debbie Noonan, and Lois and Daniel Drell.

Biography

Daniel Crown Rosenberg is originally from Northern Virginia. He graduated from the College of William and Mary in 1988 with a Bachelor of Science in Computer Science and enjoyed a successful career in that field for many years. In 1995, he entered the developmental psychology graduate program at George Mason University and focused on child cognitive development. He graduated in 1997 with a Masters of Arts in Developmental Psychology. In 1998, he enrolled in the developmental psychology graduate program at North Carolina State University where he is currently completing the Masters of Science degree with a focus in adult cognition and aging.

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Introduction

The psychology literature contains many examples of age differences in cognition. In recent years, Hess and colleagues have shown that the normative cognitive changes associated with aging impact impression formation (Hess, McGee, Woodburn, & Bolstad, 1998). Their work examined the effects of the hypothesized reduction of cognitive resources with age and they discovered that older adults are swayed more easily by irrelevant information than are younger adults. More specifically, they demonstrated that susceptibility to affective priming, when making judgments about both people and neutral stimuli, increases with age (Hess et al., 1998; Hess, Waters, & Bolstad, 2000).

This research into age-related cognitive differences suggests a practical demonstration of affective priming. That is, in a real-world situation, are there age differences in susceptibility to an affective prime? Using a consumer judgment task, I investigated the role of affective priming and how it may influence older and younger adults differently when they make evaluative judgments. For the purposes of this study, I define “prime” as a stimulus that is intended to influence attitude and judgment response—what Petty and Wegener (1999) refer to as an irrelevant source or nonmessage factor—whether a person realizes it or not. To provide background, I will identify the types of processing associated with a judgment task and discuss the factors that influence processing. Then, I will attempt to link what we know about aging and cognition with the social and consumer literature to predict the behavior of younger and older adults.

Processing Types

Petty and Cacioppo’s (1981) Elaboration Likelihood Model (ELM) explains judgment behavior in terms of the extent to which elaboration (i.e., the likelihood of

scrutinizing information on a low-to-high continuum) and processing (central and/or peripheral) occur. When elaboration likelihood is low, less information-processing is likely to occur than when elaboration likelihood is high (see Petty and Wegener (1999) for a detailed account of the ELM and descriptions of high elaboration thought). Central processing is characterized by the analysis of issue-relevant information, whereas peripheral processing is associated with thinking that allows for ease of processing. The difference between central and peripheral processing may be quantitative and/or qualitative in nature, and both may occur during low elaboration.

According to Petty and Wegener (1999), central processing, when elaboration likelihood is low, consists of reduced effort processing of issue-relevant information (quantitatively less processing than when elaboration likelihood is high). Petty and Wegener describe this as “a low-effort scrutiny of the information available (e.g., examining less information than when elaboration is high or examining the same information less carefully)” (p. 42). Peripheral processing is always low-effort, such as analyzing information as peripheral cues or using heuristics (both quantitatively and qualitatively less processing than when elaboration likelihood is high). The level of elaboration likelihood depends on both motivational and ability factors. When motivation is low and ability is high, cognitive effort will tend to be low, unless the message increases one’s motivation (e.g., the content is found personally relevant to the reader). When ability is low and motivation is high, cognitive effort will remain low until a person is more able to think about the issue. When ability and motivation are both high (or when both are low), then cognitive effort will also tend to be high (or low). The factors of interest in the current study were the role of cognitive ability

and susceptibility to the influences of irrelevant information that is affective in nature in a situation where elaboration likelihood is presumed to be low.

Cognitive Ability and Aging

Every individual is thought to have limited processing resources (i.e., working memory span, or space) available for any given task (Craik, 1983). When that capacity is taxed, people tend to rely on simplified strategies for dealing with new information and, as a result, may become susceptible to using irrelevant information as a source for judgment (Forgas, 1995). For example, when a person experiences information overload, he or she may rely on a stereotypical or affective piece of information that allows for ease of processing in making a judgment (i.e., processing becomes more automatic and less effortful). Information complexity also influences ease of processing. As the complexity of target information increases, so do the processing demands on cognitive capacity. Consequently, complexity may also increase susceptibility to irrelevant information by decreasing available cognitive capacity (Forgas, 1995).

One of the more prominent perspectives in the psychology and aging literature is that aging is associated with a decline in the efficiency of controlled cognitive processing mechanisms (Hasher & Zacks, 1988). Although, with training or everyday use, older adults can prevent or compensate for much of their cognitive decline (Lachman, 1991), differences still exist in the general population (Zacks & Hasher, 1994). Age-related differences in controlled cognitive mechanisms have been demonstrated with studies of inhibition or directed ignoring (Zacks & Hasher, 1994), monitoring (Hashtroudi, Johnson, Vnek, & Ferguson, 1994), control over attention (West & Baylis, 1998), and initiation of operations

(Craik, 1986). The main interest here is how the factors of capacity and information complexity affect the use of controlled mechanisms (i.e., ignoring irrelevant information) by different age groups.

As mentioned above, every individual is thought to have limited mental capacity and processing resources available for any given task, and these resources tend to show age-related deficits (Craik, 1983). For example, the efficiency of working memory is thought to decline with age (Hasher & Zacks, 1988). Zacks and Hasher (1994) used the mechanism of inhibition to explain this decline and describe the general pattern of age differences found in these studies as “suggestive of a deficit in inhibitory attentional mechanisms in older adults” (p. 243). Specifically, older adults have greater difficulty than younger adults inhibiting distracting or irrelevant information in the environment and generally do not habituate to recurring distraction. More simply, older adults tend to lose some level of efficiency in their working memory and make more memory-related errors than do younger adults (Zacks & Hasher, 1994). That is, because older adults are less efficient than younger adults at ignoring irrelevant information, increasing the amount or complexity of presented information results in more intrusions of irrelevant information into older adults’ memory, and, therefore, older adults make more retrieval errors.

Individual differences are another important factor in the motivation to process. One of these differences is personal need for structure (PNS). PNS is described as a desire or preference for simple structure and clarity in order to avoid ambiguity (Moskowitz, 1993; Neuberg & Newsom, 1993; Schultz & Searleman, 1998) and is measured by the PNS scale developed by Thompson, Naccarato, and Parker (1989). In older adults, high PNS may be

associated with a decline in cognitive resources (Hess et al., 2000; Hess, 2001), or it may simply be a result of social goals and situational context (Blanchard-Fields, 1996). Older adults may have different motivations for performance than younger adults, leading older adults to use as simple a strategy as possible when making a judgment about new information (Hess et al., 2000). On the other hand, some adults actually enjoy effortful thinking and are said to be high in need for cognition (NFC), as measured by the NFC scale developed by Cacioppo, Petty, and Kao (1984). Some situations may appeal to the social goals of an older adult (e.g., teaching children about their culture), while other situations may not (e.g., memorizing the names and faces of heavy metal musicians). Although individual differences may affect processing motivations, in the general case one would predict that the general decline in the efficiency of cognitive capacity combined with a task containing complex information would result in older adults relying on peripheral processing of cues more often than would younger adults.

The general belief is that the judgments of older adults tend to be more susceptible to irrelevant affective information than those of younger adults. Hess and colleagues (Hess et al., 1998; Hess et al., 2000) have provided support for this view. In these studies, when young adults were aware of the affective prime, they were able to correct for its influence. Older adults, on the other hand, made judgments partially based on the irrelevant, affective information when they were aware of its influence. Hess et al. explained the age differences in affective priming as a result of age-related declines in controlled processing mechanisms, which result in an over-reliance on automatic processing mechanisms. A decline in controlled processing mechanisms and over-reliance on automatic processing mechanisms is

similar to moving away from high elaboration, in that both controlled processing and high elaboration rely on much active scrutiny of information. Moving away from this form of processing may increase the influence of irrelevant information.

Additionally, Hess et al. (2000) found that PNS is more predictive of affective priming effects in older adults than in younger adults. More specifically, the higher the PNS in older adults, the more prime-congruent evaluations were made. It is possible that age-related deficiencies in cognitive resources are why PNS was more predictive for older adults' behavior than younger adults' behavior. Such deficiencies may lead to a need to compensate through structural changes in cognition. Consequently, PNS may be more strongly predictive of the behaviors that result from such changes.

The finding that older adults have difficulty discounting affective stimuli even when aware of the potential influence on judgment (Hess et al., 1998; Hess et al., 2000) is especially relevant to advertising when one takes into consideration that, in general, consumers are quite aware of the reason behind attempts to manipulate affect, such as those involved in celebrity endorsement (Gordon, 1997). For the most part, consumers realize that when celebrities are not experts, they only serve to get a customer's business through association, and thus they are easily discounted (i.e., non-expert celebrity endorsers act as peripheral affective cues). There is the potential for aging effects, however, because younger adults are better than older adults are at discounting affective information when they are aware of its potential influence. Celebrity endorsement may have more influence on older adults' judgments than on younger adults' judgments due to this susceptibility to affective information. This influence may be more salient when we consider that cognitive capacity is

an important influence on mental processing and that there are general cognitive declines associated with aging. To grasp fully the potential for an affective prime to have an influence on consumers' judgments, one must understand the role of a source as a cue in advertising and persuasion.

The Influence of a Source as a Peripheral Cue

When a source, such as a celebrity endorser, has no relevant relationship to the message (i.e., serves only as an irrelevant cue) then that source will tend to influence judgment when elaboration likelihood is low, but not high (Chaiken, 1980; Chaiken & Maheswaran, 1994; Petty & Wegener, 1999). Petty, Wegener, and White (1998) demonstrated that source likability influences judgment during low elaboration unless specific instructions to correct for such an influence are given.

Consumer situations in which personal involvement and/or consequences are low tend to be conducive to low elaboration and peripheral processing, due to a lack of motivation (Petty & Cacioppo, 1981). The consumer literature contains many examples of how motivation, cognitive capacity, and complexity of information determine the influence of source cues on judgment (Forgas, 1995; Mehta, 1994; Petty & Cacioppo, 1981). When motivation is low, a consumer makes his or her judgment based on the cues that provide a simple acceptance or rejection (e.g., the affective cues of music or the endorser). High consequence situations usually involve high elaboration likelihood and central processing (Petty & Cacioppo, 1981). In these cases, a consumer is motivated to evaluate the quality of the factual message in a given advertisement (e.g., product effectiveness). However, a consumer engaged in high elaboration will still consider the merits of a celebrity source in

his or her judgment (Petty & Wegener, 1999). It is important to understand that central and peripheral processing occur simultaneously in decision-making; however, one will dominate depending on the context (i.e., motivation and ability; Mehta, 1994).

Hypotheses

In this study, I investigated affective priming and age differences in a practical situation that involves a consumer judgment task. Specifically, participants gave ratings for attitude (i.e., product evaluation and advertisement effectiveness) and purchase intent, recorded their thoughts, and free recalled information contained in a variety of print advertisements for products endorsed by non-expert celebrities and noncelebrities. In addition, the celebrities varied in likability, creating the affective priming manipulation. The combination of the high complexity of the advertisements (i.e., the large amount of information provided), the cognitive capacity required to process that information, and the lack of motivation enhancement by the experimenter was intended to facilitate low-elaboration.

Although both younger and older adults were expected to engage in relatively low elaboration, I hypothesized that the older adults would behave even lower on the elaboration continuum than would younger adults, due to age-related changes in cognitive resources (i.e., lesser ability with age). If the older adults engage in lower elaboration than did the younger adults, then they should also demonstrate more susceptibility to the affective primes (i.e., the celebrity endorsers) in their judgments than should the younger adults. In other words, older adults, in general, should be less able to both process the amount of information presented and inhibit the influence of the affective primes than should the younger adults. This

difference between the two age groups was expected to be reflected in the participants' thoughts and their attitudes (as given by ratings on Likert scales).

Specifically, younger adults' thoughts about the ads were expected to contain more remarks about information relevant to the message and less about information irrelevant to the message than older adults' thoughts. Attitude ratings were expected to reflect the level of likability of the endorser (i.e., more positive for a likable celebrity and more negative for an unlikable celebrity) and be more extreme for the older adults than for the younger adults. In other words, younger adults' attitude ratings were expected to be less influenced by the celebrity endorsement than ratings provided by older adults. Consistent with the literature (Ohanian, 1991; Petty, Cacioppo, & Schumann, 1983), I did not expect purchase intent to be influenced by type of processing.

Additionally, I hypothesized that as the tendency to engage in simplified processing increases (i.e., the avoidance of effortful thinking), the more likely a person would be to rely on heuristics (i.e., peripheral processing of the affective primes). A participant who scores high in PNS should show greater discrimination between affective conditions in their attitude ratings and thoughts than a participant who scores lower in PNS. Consistent with prior research (Hess et al., 2000), I only expected PNS to be predictive of attitude ratings and thoughts provided by the older adults. I also measured NFC with the expectation that those higher in NFC would be more able to negate the influences of the affective information than those lower in NFC.

Finally, I hypothesized that the younger adults would be more accurate than the older adults in their free recall of the information contained in the advertisements. I also expected

that both age groups would be more accurate in their free recall of advertisements with celebrity endorsers. This expectation follows past research that shows that during low elaboration, participants have greater recall for products with celebrity endorsers than those with non-celebrity endorsers (Mehta, 1994; Petty, et al., 1983). It is important to note that recall is not an accurate reflection of processing or attitude formation (Petty, et al., 1983).

Method

Participants

Two different age groups were tested. A younger group (18 women and 18 men, M age = 19.03 years, age range = 17–24, M years of education = 13.03) was drawn from the university's Introductory Psychology pool, and an older group (17 women and 18 men, M age = 71.11 years, age range = 65–79, M years of education = 16.39) was drawn from an existing pool of people who responded to newspaper advertisements. The younger age group received class credit for participating (one student was replaced due to her difficulty understanding English and following the instructions). The older participants were community volunteers and were paid \$10. Participants were predominantly white, Non-Hispanic with one Asian, 4 African-Americans, and one self-described as "other." With an alpha = .05 and an expected medium effect size = .25, power was calculated at .61 for the two-way interaction (Endorser Type \times Valence) and .56 for the three-way interaction (Age Group \times Endorser Type \times Valence).

Design

This study uses a 2 \times 2 \times 3 (Age Group \times Endorser Type \times Valence) design with seven dependent measures: recall of relevant information, recall of irrelevant information,

thoughts about relevant information, thoughts about irrelevant information, two attitude measures, and a rating of purchase intent. Age Group consists of two groups of adults: younger vs. older. Endorser Type contains two levels of status: famous vs. nonfamous. Valence consists of three levels: positive, neutral, and negative (equivalent to high in likability, neutral likability, and low in likability, respectively). Valence was only manipulated in the famous condition; that is, nonfamous endorsers were neutral in likability with unfamiliar names, thereby providing a baseline comparison for the three levels of valence in the famous condition.

Materials

Advertisements. Experimental materials included six versions of six different print advertisements (each advertisement separately printed with each endorser), forms for participants to use for thoughts and recall, and a product rating form. The basic print advertisements constituted three pairs of products (two competitors each for soup, toothpaste, and laundry detergent). Each ad had an identical structure and the pictures of the products themselves consisted only of basic drawings, with the same drawing being used for each of the advertisements for the same product type. Identifying words and logos were not used in order to prevent interference due to brand loyalty or any other design element. Each advertisement contained five facts about the product. These advertisements were pilot tested with nonfamous endorsers for attitude ratings by both age groups. No one advertisement showed a distinct advantage over its “competitor.” See Appendix for examples of the six advertisements.

For each of the three product types, each participant saw two choices. One choice always had a nonfamous endorser and the other had a celebrity endorser (either high in likability, neutral likability, or low in likability). The celebrity endorser was counterbalanced across all ads within age groups, so each product was tested with each endorser and each endorser was seen in the same position (i.e., first, second, etc.) an equal number of times. A pilot test determined the celebrities used in this study by measuring the familiarity and likability (via 7-point Likert scales) of 30 famous people. The three final choices tested high in familiarity and for the appropriate level of likability to both age groups (high = Michael Jordan, neutral = Bill Gates, and low = Mike Tyson). Three nonfamous endorsers were selected at random from the phone book and identified by pilot test as unfamiliar names. Nonfamous endorsers were randomly matched with famous endorsers for each participant.

Cognitive ability. In order to test that the generally observed age differences in cognitive ability apply to the pool of participants, I used letter and pattern comparison tasks (Salthouse & Coon, 1994) and the WAIS letter–number sequencing task (Wechsler, 1997) to obtain measures of processing speed and working memory efficiency. The letter and pattern comparison tasks each consist of an instruction page with three samples and two test pages. The pattern comparison task consists of 30 pairs of patterns on each page, whereas the letter comparison task consists of 21 pairs of letter sequences of 3 to 9 letters each per page. For both of these tasks, participants were read the instructions on the front page and then they completed the three samples. They then had 30 s per test page to complete as many of the comparisons as they could. Participants wrote either an “S” or a “D” on the line between a pair to indicate if the members of the pair are the same or different. The WAIS letter–number

sequencing task has 7 trials with three sets of stimuli each ranging from 2 characters (trial 1) to 8 characters (trial 7). Odd trials have equal numbers of letters and numbers and even trials counterbalance the extra character. Participants were required to recall the stimulus sets with the numbers in order from lowest to highest followed by the letters in alphabetical order. Correct recall of each stimulus set counted as 1 towards the final score (i.e., a maximum of 21). I also used the Vocabulary Test 2 from the Kit of Factor-Referenced Cognitive Tests (Ekstrom, French, Harman, & Derman, 1976) to examine verbal ability.

Measures of intrinsic motivation. I tested need for structure using 11 items taken from Thompson et al.'s (1989) personal need for structure (PNS) scale. Each item is rated on a 6-point Likert scale with 1 indicating "Strongly Disagree" and 6 indicating "Strongly Agree." This scale has a strong history of validity (Moskowitz, 1993; Neuberg & Newsom, 1993; Schultz & Searleman, 1998) and reliability with Cronbach's alphas ranging from .76 to .86 (Neuberg & Newsom, 1993). I tested need for cognition (NFC) using the 18-item short version of the NFC questionnaire Cacioppo, Petty, & Kao, 1984). Each item is rated on a 7-point Likert scale with 1 indicating "Strongly Disagree," 7 indicating "Strongly Agree," and 4 as "Neutral." This scale has a strong history of validity (Haugveldt, et al., 1992) and reliability with Cronbach's alphas usually above .85 (Cacioppo, Petty, Feinstein, & Jarvis, 1996).

Background questionnaire. Background data was assessed using a 26-item questionnaire that covers a variety of topics including ethnicity, education, career, sociability, health, and emotional status (e.g., "Relatively speaking how would you rate your current

general state of physical health” on a 5-point scale with 1 meaning “excellent” and 5 meaning “poor”).

Procedure

Participants were tested individually. Each participant completed the background questionnaire first, followed by the speed measure, vocabulary test, the PNS and NFC measures, and the working memory test. In the main task, each participant was told to review advertisements for toothpaste, soup, and laundry detergent and provide feedback. In addition, each participant was told that common products are presented in the same graphic layout, fonts, and color scheme, and with similar pictures to prevent any influence due to brand loyalty or any design elements. The experimenter emphasized that we were not interested in how the advertisements look. Each participant then reviewed one of the six print ads and provided feedback before proceeding to the next ad. Each product type had one ad with a nonfamous person endorsing it and one ad with one of three kinds of celebrity endorser (likable, neutral likability, or unlikable). Presentation order of the advertisements was randomized across participants, even though previous research shows that order of presentation of print ads does not affect persuasion (Unnava, Burnkrant, & Erevelles, 1994).

Each participant viewed each ad for as long as he or she wished. During this time, the participant rated each product on the three attitude scales. Past studies have shown that ratings, thoughts, and recall are meaningful measures in advertising and persuasion research (Mehta, 1994; Petty, et al., 1983; Spotts, 1990). These types of evaluation scales are used to gather participants’ feelings about the sample products, and they have a history of successful use in the advertising effectiveness literature. The attitude scales selected for this study

related to (1) purchase intent, (2) product evaluation, and (3) advertisement effectiveness. These attitudes were measured with nine-point scales ranging from -4 (representing the extreme negative evaluation; i.e., I definitely would not buy this product, I do not like this product at all, I think this ad is ineffective) to $+4$ (representing the extreme positive evaluation; i.e., I definitely would buy this product, I like this product very much, I think this ad is very effective). After each ad was examined and rated, the participant was given 2.5 minutes to write down thoughts and feelings about the ad. The participant was informed that the response sheet contained more space than was expected to be needed, and should not let that discourage the participant. Furthermore, the participant was instructed to ignore spelling, grammar, and punctuation. After the final ad was viewed, the participant was given a surprise free recall task and wrote down as much information as he or she could remember about each separate advertisement. The information gathered through this task was used to assess accuracy and the presence of the affective prime in memory. Finally, the experimenter debriefed the participant.

Results

An alpha level of .05 was used for all statistical tests.

Background Measures

Age group comparisons for the cognitive and noncognitive background measures are presented in Table 1. For the speed measure, the number correct on each task was converted to a z -score and then the two z -scores were averaged together, whereas performance in the letter-number sequencing task was indicated by the number of stimulus sets correctly ordered. The younger adults outperformed the older adults on both the working memory and

speed measures, $t(69) = 3.36$ and $t(69) = 8.18$, respectively. In addition, older adults performed better than the younger adults on the vocabulary test, $t(69) = -7.56$. PNS did not vary with age; however, NFC was lower for the younger adults, $t(68) = -2.95$ (one older adult did not fully complete the NFC questionnaire). The two age groups did not differ on the health or emotional well-being scales included in the background questionnaire. These age effects are consistent with normative trends in the literature, and suggest that the present sample is reasonably similar to those used in other studies.

Thoughts

Participants wrote down their thoughts and feelings about the advertisements during exposure. Thoughts were categorized as about the endorser, the product, the advertisement (e.g., graphics, layout, word use), or off-topic. Endorser thoughts were then broken down into two additional categories, central (e.g., “What does Michael Jordan have to do with toothpaste?”) or peripheral (e.g., “I wonder how many microwaves Bill Gates has.”). Two independent raters scored all thoughts according to the categories defined above. Interrater reliability was .92 with differences resolved through discussion. Central thoughts about the endorser and product were combined to create the summary category *relevant thoughts*. Peripheral thoughts about the endorser, advertisement thoughts, and off-topic thoughts were combined to create the summary category *irrelevant thoughts*.

An Age Group \times Endorser Type \times Valence \times Relevance \times PNS/NFC ANOVA with thoughts as the dependent variable revealed a main effect for relevance, $F(1, 68) = 45.47$. Participants had significantly more relevant thoughts ($M = 2.67$, $SD = 1.58$) than irrelevant thoughts ($M = 1.44$, $SD = 1.23$). This was qualified by two first-order interactions. The first

was an Age Group X Relevance interaction, $F(1, 68) = 4.04$, but the pattern of results was opposite to that predicted. Specifically, older adults had more relevant thoughts than did younger adults, whereas irrelevant thoughts did not differ across groups (see Table 2). Additionally, there was an Endorser Type X Relevance interaction, $F(1, 68) = 4.17$, which was due to more relevant thoughts being produced about products with nonfamous endorsers than about those with famous endorsers. PNS did not have an effect and no relationship with NFC was revealed when substituted for PNS in the analysis, $ps > .10$.

There was an unexpected main effect for endorser type, $F(1, 68) = 3.98$. Participants had significantly more thoughts when a product was endorsed by a nonfamous person ($M = 2.10$, $SD = .77$) than a famous person ($M = 2.01$, $SD = .74$).

The proportion of total thoughts that were irrelevant was also computed (i.e., number of irrelevant thoughts divided by the total number of thoughts) to compare differences in overall proportions of information relevance in thought processing while controlling for the number of thoughts produced. This revealed a main effect for age, $F(1, 68) = 4.74$. Younger adults generated proportionally more irrelevant thoughts ($M = .41$, $SD = .15$) than did older adults ($M = .32$, $SD = .20$). These data contradict hypotheses that older adults would generate more irrelevant thoughts than would younger adults (i.e., greater peripheral processing). This suggests that the older adults were engaging in more elaboration than were the younger adults.

In sum, participants generated more thoughts about products endorsed by nonfamous endorsers than for those with famous endorsers. Participants generated more relevant thoughts than irrelevant thoughts, especially for products endorsed by nonfamous endorsers,

and especially by older adults, in general. Additionally, participants generated proportionally more relevant thoughts than irrelevant thoughts, and this difference was greater for older adults than it was for younger adults.

Purchase Intent and Attitude

Participants rated each product for purchase intent and general attitude (i.e., product is bad–good and advertisement is ineffective–effective). These ratings were first analyzed with an Age Group \times Endorser Type \times Valence \times PNS multivariate analysis of variance (MANOVA) and an Age Group \times Endorser Type \times Valence \times NFC MANOVA. PNS and NFC were treated as continuous variables, both were standardized to control for potential multicollinearity effects.

Contrary to expectations, there were no significant effects associated with age group, p s $>$.40 (see Table 3 for a breakdown of means). Additionally, there was no Endorser Type \times Valence interaction in the multivariate test ($p = .17$); however, the univariate test revealed some significant results. As expected, purchase intent was not affected by the manipulation, $F(2, 138) = .817$, $p = .44$. However, the Endorser Type \times Valence interaction was significant for product evaluation and advertisement effectiveness, $F(2, 138) = 3.06$ and $F(2, 138) = 3.38$, respectively. Products and advertisements with Bill Gates as an endorser received higher ratings than did those with Michael Jordan, and those products received higher ratings than those endorsed by Mike Tyson (see Table 4 for significant differences). Apparently, this sample did not like Michael Jordan more than it liked Bill Gates, in contrast to the pilot population. Additionally, those products and advertisements with Bill Gates as a famous endorser received higher ratings than their counterparts with nonfamous endorsers, whereas

the opposite was true for *both* Michael Jordan and Mike Tyson. However, an examination of the means reveals these phenomena seem limited to the older adults, although the age differences were not significant (see Table 3).

Contrary to expectations, there was no endorser type effect in the multivariate test ($p = .41$). Also contrary to expectations, PNS and NFC did not play significant roles ($ps > .10$) except for an Endorser Type \times PNS interaction for purchase intent. Specifically, there was a small, yet significant, correlation between PNS and purchase intent for products with nonfamous endorsers, $r(71) = -.26$. Those higher in PNS were less likely to purchase products endorsed by nonfamous people than those lower in PNS.

In sum, neither age, PNS, nor NFC played a significant role in how participants rated the advertisements. In addition, purchase intent was not affected by the manipulation. Ratings for product evaluation and advertisement effectiveness were generally lower for products endorsed by Mike Tyson than for products with other endorsers.

Recall

Participants free recalled information points using six separate pages, one for each advertisement. Participants were allowed to recall advertisements in any order. The number of correctly recalled relevant information points (i.e., the gist of the five main points presented in each advertisement) and irrelevant information points (i.e., correct identification of the endorser and a clear attempt at recalling the title of each endorsement) were recorded. Recall was scored using three different methods. In Method 1, advertisements were assigned to an endorser according to the majority of items correctly recalled on a specific page. In Method 2, advertisements were assigned to an endorser according to endorser identification;

if no endorser was identified for either of two competing ads, then Method 1 was used. In Method 3, correct recall for an advertisement was counted regardless of the page its items was written on (i.e., as though all six recall pages were just one long list). Two independent raters scored all recall data using all three methods. Interrater reliability was .97, with differences resolved through discussion. Differences between the means from the three recall scoring methods were slight; analyses of each type of score yielded the same significant effects with one additional significant interaction from Method 1. Therefore, reported results are from recall scoring Method 1 only, with the single discrepancy noted.

Recall scores were converted to proportions (i.e., the proportion of the five relevant information points recalled and the proportion of the two irrelevant information points recalled). An Age Group \times Endorser Type \times Valence \times Relevance ANOVA with proportion recalled as the dependent variable revealed a main effect for age group, $F(1,69) = 37.16$. As predicted, younger adults correctly recalled more information about the products ($M = .38$, $SD = .20$) than did the older adults ($M = .22$, $SD = .19$). There was also a main effect for endorser type, $F(1,69) = 88.16$. As predicted, participants recalled more information about advertisements with famous endorsers ($M = .38$, $SD = .22$) than with nonfamous endorsers ($M = .22$, $SD = .17$).

There was also a main effect for relevance, $F(1,69) = 72.34$. Overall, participants correctly recalled more of the relevant information ($M = .39$, $SD = .29$) than irrelevant information ($M = .21$, $SD = .27$). This effect was qualified by two first-order interactions. There was an Endorser Type \times Relevance interaction, $F(1,69) = 110.90$, due to recall for irrelevant information in advertisements with famous endorsers being greater than

advertisements with nonfamous endorsers (consistent with expectations), whereas relevant recall was not affected by endorser type (see Table 5). There was also an Age Group X Relevance interaction, $F(1,69) = 6.18$, due to the age differences in recall being greater for relevant information than for irrelevant information (see Table 6).

Only scoring Method 1 produced an Age Group X Endorser Type interaction, $F(1,69) = 4.15$. As predicted, both age groups recalled more information from advertisements with famous endorsers than from advertisements with nonfamous endorsers; however, this difference was larger for the younger adults (see Table 7). As a note of interest, the ratio of the proportion of presented items recalled from advertisements with nonfamous endorsers to the proportion from advertisements with famous endorsers was similar across age groups (young = .60 and older = .57). This means that although the difference in proportional recall due to endorser type was larger for the younger adults than for the older adults, this difference seems to be only quantitative rather than qualitative.

The proportion of total recall that was irrelevant was also computed (i.e., number of irrelevant items recalled divided by the total number of items recalled) to compare differences in overall proportions of information relevance in memory. Given that there were different numbers of relevant and irrelevant pieces of information, this measure provided a more sensitive index of the extent to which irrelevant information dominated recall. As predicted, the proportion of total recall that was irrelevant was greater for older adults ($M = .41$, $SD = .03$) than for younger adults ($M = .22$, $SD = .03$), $F(1, 69) = 16.04$. Predictions for endorser type differences were also supported. The proportion of total recall that was irrelevant was greater for advertisements with famous endorsers ($M = .39$, $SD = .03$) than

with nonfamous endorsers ($M = .24$, $SD = .03$), $F(1, 69) = 26.16$. There were no significant interactions ($ps > .28$).

In sum, younger adults correctly recalled more information than did the older adults, especially the relevant information, and the older adults recalled proportionally more irrelevant information than did the younger adults. Additionally, famous endorsement boosted advertisement recall, especially for younger adults, and especially for irrelevant information.

Discussion

The purpose of this study was to investigate the influence of affective priming and aging on consumer judgments. Based upon previous research showing that aging is associated with increased susceptibility to task-irrelevant information (Hess et al., 1998; Hess et al., 2000), it was hypothesized that older adults' decision processes would be more influenced by endorser likability than those of younger adults. I tested this hypothesis within the context of the Elaboration Likelihood Model (Petty & Cacioppo, 1981). This hypothesis was examined by looking at age differences in thoughts, ratings, and recall for various advertisements.

Due to their reduced cognitive resources, I expected that older adults would be, in general, more likely to engage in lower elaborative thought than would younger adults. Consistent with this hypothesis, older adults' thoughts about the ads were expected to include fewer remarks about relevant information and more about the irrelevant information than the younger adults' thoughts. Older adults' ratings for product evaluation and advertisement effectiveness were also expected to be more influenced by celebrity endorser likability than

ratings provided by the younger adults. Furthermore, need for structure was expected to predict processing in older adults, such that the higher older participants score on the PNS measure, the more they would engage in peripheral processing. Finally, due to general aging-related changes in memory, younger adults were expected to be more accurate than the older adults in their free recall of the information contained in the advertisements.

The hypothesis that older adults would be, in general, more likely to engage in lower elaborative thought than would younger adults was not supported by performance in the thought-listing task. The older adults produced more relevant thoughts about the advertisements than did the younger adults. Additionally, the younger adults generated more irrelevant thoughts in relation to total thoughts produced about the advertisements than did the older adults. This could be taken to suggest that the younger adults were engaging in less elaborative processing than the older adults were during the thought generation task. No support was obtained for this hypothesis when ratings were examined, however, as there were no age differences in attitudes for advertisement effectiveness or product evaluation.

The results from the recall task were consistent with expectations as younger adults recalled more accurate information than did the older adults. Although both age groups recalled more relevant than irrelevant information, this difference was greater for the younger adults than for the older adults. Contrary to expectations and previous research (Hess et al., 2000), PNS did not predict the susceptibility to prime influences in the older (or younger) adults. However, PNS had a negative relationship with purchase intent for products endorsed by nonfamous people. The higher the PNS score (regardless of age), the less likely participants were to purchase a product with a nonfamous, non-expert endorser. It is

important to note that although this was a significant relationship, it was weak at best and may not be replicable.

Although some support was obtained for my hypotheses, there were several cases where null or contradictory evidence was obtained. For example, the two age groups' processing differed in their thought generation, but not in their attitude ratings, when it was expected that age differences in processing would be similar for the two tasks. Because the younger adults showed greater working memory and processing speed abilities than the older adults, and the information presented was fairly complex, it seems logical that the older adults would process less elaborately than would the younger adults. This was not the case. Therefore, it seems that the older adults may have been motivated enough to overcome a capacity-complexity imbalance and process more elaborately than young adults. This is supported by the finding that older adults were higher in need for cognition (NFC) than were the younger adults. NFC is an acceptable measure of motivation (Wegener, Downing, Krosnick, & Petty, 1995) and motivation can increase elaboration if a message is personally relevant (Petty & Wegener, 1999). Hess, Rosenberg, and Waters (2001) suggest that older adults are selective in their use of cognitive resources and can process similarly to younger adults when motivated to do so. Perhaps, a consumer judgment situation is one in which older adults are motivated to be more accurate and employ more of their cognitive resources than they would normally (e.g., paying closer attention to the facts in order to avoid wasting retirement money, the novelty of participating in a research study).

On the other hand, it is possible that the lack of age differences in ratings was due to the ineffectiveness of the priming stimuli. Feelings about specific celebrities may preclude

their use as a priming mechanism when testing groups. However, this does not explain why the younger adults generated more thoughts about presumably irrelevant information in proportion to total thoughts than did the older adults. It is possible that the younger adults felt some of the irrelevant information was actually relevant (due to a possible limitation in the author's a priori conceptualization of what constitutes relevant versus irrelevant information). Thoughts about the advertisement itself (e.g., wording) were scored as irrelevant. However, younger adults may have felt that their thoughts about advertisement presentation and choice of endorser were of central interest to this study because we asked them to make a rating of overall effectiveness—similar to a focus group that provides feedback about commercials and other media for an advertising agency—even though logically such information is irrelevant to the quality of the product advertised and need not be included in meaningful thought elaborations.

Although the recall results matched expectations, it is generally accepted that recall is not a reliable measure of central versus peripheral processing (Petty et al., 1983). Recall behavior may, however, be interpreted as older adults considering the irrelevant information during encoding because it is easy to process, which is a sign of less elaborative processing than if they had completely ignored the irrelevant information and focused solely on the relevant information. In other words, although the older adults may have concentrated on the relevant information during thought generation more than the younger adults did, the older adults seemed to allow more of the names and slogans to move into long-term memory than did the younger adults. It is also possible that there were no age differences during encoding. This would mean that the older adults might have been affected by age-related declines in

cognitive abilities that result in deficient retrieval skills, which has implications for memory-based judgments as opposed to on-line processing.

There were several non age-related findings of note. I hypothesized that participants would be more likely to engage in elaborative processing when an endorser was nonfamous than when the endorser was famous, regardless of age. Furthermore, I expected that the attitude ratings should be more extreme with the level of likability of the endorser (i.e., more positive for a celebrity high in likability and more negative for a celebrity low in likability).

Contrary to these hypotheses, there were few significant differences in the ratings for advertisement effectiveness and product evaluation between the products with famous endorsers and the products with nonfamous endorsers. Consumer behavior differences based on endorser fame are consistently found in advertisements during low elaboration conditions (Mehta, 1994; Petty et al., 1983). However, hypotheses concerning the impact of the priming manipulation on processing were partially supported when comparisons between advertisements with the negative prime and the other stimuli were examined. Advertisements with Mike Tyson (the negative prime) received significantly lower ratings than did advertisements with the other two famous endorsers (the positive and neutral primes) and his nonfamous counterparts, but the other endorsers did not significantly differ from each other or their nonfamous counterparts. This means that although the positive prime (i.e., a celebrity endorser high in likability) did not affect judgment, the negative prime (i.e., a celebrity endorser low in likability) did do so. In other words, the appearance of a strong negative prime may lead to peripheral processing during low elaboration, even when a strong positive prime does not do so. The reason underlying this phenomenon may have to do with the

uniqueness of the context. Consumers may expect attempts to influence their attitudes and behavior through the inclusion of strong positive, irrelevant information in advertising and thus may be more able to control for such an influence. Consequently, it may be that the appearance of strong negative information, relevant or not, is surprising enough to induce more peripheral than central processing when such a stimulus is entirely unexpected. In this case, a strongly disliked celebrity is mentioned when one would expect the opposite, resulting in such a negative reaction that one cannot help but process that information as a peripheral cue, even though the nonnegative celebrities seemed easily discounted.

It is important to note that advertisements with Michael Jordan (the positive prime) did not consistently receive better (non-significant) ratings than those with Bill Gates (the neutral prime), and the differences between them and their nonfamous counterparts were sometimes counterintuitive. This supports the previously mentioned idea that feelings about particular celebrities are so individual that they may not be an appropriate, or reliable, basis for affective priming when testing groups (i.e., findings from a pilot population may not generalize). On the other hand, participants generated more relevant than irrelevant thoughts, and this difference was greater for advertisements with nonfamous than famous endorsers. This supports the hypothesis of more elaborative processing for the nonfamous endorser conditions than for the famous endorser conditions. In other words, when an advertisement contains a nonfamous, non-expert endorser, the content receives added attention as compared to an advertisement with a famous, non-expert endorser. Famous, non-expert endorsers, regardless of likability, may capture a consumer's attention away from the actual content of the advertisement during thought generation.

Aside from the previously mentioned relationship with PNS, the fame of a non-expert endorser did not affect purchase intent, which supports hypotheses and past research (Mehta, 1994; Ohanian, 1991; Petty et al., 1983). Although other cues may influence judgment of an advertisement and/or a product, when it comes to deciding whether to buy the product, the celebrity status of the endorser seems easily discounted.

I hypothesized that both age groups would be more accurate in their free recall of advertisements with the famous endorsers than those ads with nonfamous endorsers. In support of this hypothesis, recall was greater for advertisements with famous endorsers, in general, than for advertisements with nonfamous endorsers, which is consistent with the literature (Mehta, 1994; Petty et al., 1983). Additionally, famous endorsement tended to boost recall for irrelevant information, which could simply mean that a famous endorser is more easily remembered than is a nonfamous endorser.

I hypothesized that those higher in NFC would engage in more elaborative processing than would those who are lower in NFC. Contrary to this hypothesis, NFC did not play a role. In contrast to previous findings for consumer decision-making tasks (Haugveldt et al., 1992), those in this sample who enjoy processing complex information did not seem different from those who do not enjoy such activities, aside from the previously mentioned age difference in NFC. However, Haugveldt et al. (1992) used pictures of non-famous endorsers that differed in attractiveness in their test advertisements (they compared strong versus weak arguments using relevant information in the first two studies). Perhaps, NFC does not distinguish processing differences in situations where both the relevant and irrelevant information are verbal as opposed to visual.

In sum, there seems to be a relationship between age and susceptibility to task irrelevant information in consumer judgment-making tasks. Although older adults seem more susceptible than younger adults to task irrelevant information when retrieving facts from long-term memory, in certain contexts they may focus more than the younger adults do on relevant information in the short-term (i.e., thoughts about a set of information just seen). Although older adults showed susceptibility to task irrelevant information when aware of its potential influence in other priming studies (Hess et al., 1998; Hess et al., 2000), the consumer context may be an exception. Similar studies focus on participant's impressions of neutral objects and people, however, this study focused on practical objects with everyday and direct significance. Perhaps when in a context with high personal significance, declines associated with normative aging are easily overcome (e.g., Hess et al, 2001).

However, it is important to note that this study was limited in its low overall power and its use of celebrities as a priming manipulation, which for the most part, proved ineffective. By choosing such a means for priming, the potential age effects may not have been tapped. It could simply be, however, that the effect of age was not strong enough to be detected with the current sample size. Future research should conduct similar tasks, but with a more reliable method of affective priming. For example, one might use pictures with different affective impact in advertisements and manipulate level of involvement/elaboration to determine if such a visual affective component will induce age differences in consumer decision-making tasks. In conclusion, elaborative processing may depend on context and personal significance more than it depends on cognitive factors that decline with age. Thus,

conscious mental processing may be a stronger influence than more automatic mechanisms when motivation is high enough.

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Table 1

Background Measures

Measure	Young Adults	Older Adults
Education ^a	13.03 (1.46)	16.39 (3.02)
Emotional well-being	1.64 (0.76)	1.60 (0.70)
Health	1.94 (0.58)	1.89 (0.68)
Memory span ^a	12.33 (3.06)	10.03 (2.70)
Comparison speed ^a	0.60 (0.68)	-0.62 (0.57)
Vocabulary ^a	10.42 (5.92)	22.96 (7.95)
PNS	37.90 (7.33)	39.77 (7.80)
NFC ^a	73.42 (11.83)	81.12 (9.82)

Note. Standard deviations are in parenthesis. Emotional well-being and health measures were scored on a 5-point scale with 1 meaning “excellent and 5 meaning “poor.”

^aGroups are significantly different at the .05 alpha level using a *t*-test.

Table 2

Thoughts as a function of Relevance and Age Group

Relevance	Younger Adults	Older Adults
Relevant	2.36 ^a (1.45)	2.98 ^b (1.65)
Irrelevant	1.49 ^c (1.07)	1.39 ^c (1.37)

Note. Means with different superscripts are significantly different ($p < .05$). Standard deviations are in parenthesis.

Table 3

Purchase Intent, Product Evaluation, and Advertisement Effectiveness as a Function of AgeGroup, Valence, and Endorser Type

	Endorser Type	
	Famous	Nonfamous
Purchase Intent		
Young Adults		
Popular	1.43 (1.92)	1.04 (2.17)
Neutral	1.00 (1.93)	1.17 (2.27)
Unpopular	0.86 (2.11)	1.36 (1.94)
Older Adults		
Popular	0.23 (2.79)	1.11 (2.22)
Neutral	1.14 (2.55)	1.11 (2.35)
Unpopular	0.31 (2.76)	0.94 (2.50)
Product Evaluation		
Young Adults		
Popular	1.88 (1.61)	1.50 (1.80)
Neutral	1.64 (1.48)	1.33 (2.12)
Unpopular	1.00 (1.96)	1.50 (1.56)
Older Adults		
Popular	0.49 (2.82)	1.29 (2.20)
Neutral	1.40 (2.58)	1.23 (2.28)
Unpopular	0.49 (2.66)	1.29 (2.26)
Advertisement Effectiveness		
Young Adults		
Popular	1.50 (2.18)	1.06 (2.15)
Neutral	1.08 (2.13)	0.61 (2.49)
Unpopular	0.33 (2.26)	0.92 (2.14)
Older Adults		
Popular	0.54 (2.68)	1.23 (2.37)
Neutral	1.00 (2.58)	0.83 (2.49)
Unpopular	-0.06 (2.87)	0.94 (2.40)

Note. Standard deviations are in parenthesis.

Scores are on nine-point scales ranging from -4 (representing the extreme negative evaluation; i.e., I definitely would not buy this product, I do not like this product at all, I think this ad is ineffective) to +4 (representing the extreme positive evaluation; i.e., I definitely would buy this product, I like this product very much, I think this ad is very effective).

Table 4

Purchase Intent, Product Evaluation, and Advertisement Effectiveness as a Function of Valence and Endorser Type

Valence	Endorser Type	
	Famous	Nonfamous
Purchase Intent		
Popular	0.84 (2.45)	1.08 (2.18)
Neutral	1.07 (2.24)	1.14 (2.29)
Unpopular	0.59 (2.45)	1.15 (2.23)
Product Evaluation		
Popular	1.19 (2.38)	1.39 (2.00)
Neutral	1.52 ^a (2.08)	1.28 (2.19)
Unpopular	0.75 ^b (2.33)	1.39 ^a (1.92)
Advertisement Effectiveness		
Popular	1.03 ^a (2.47)	1.14 (2.24)
Neutral	1.04 ^a (2.34)	0.72 (2.47)
Unpopular	0.14 ^b (2.57)	0.93 ^a (2.26)

Note. Means with different superscripts are significantly different ($p < .05$). Standard deviations are in parenthesis.

Table 5

Proportion Recalled as a function of Endorser Type and Relevance

Relevance	Famous Endorser	Nonfamous Endorser
Relevant	.40 ^a (.29)	.39 ^a (.29)
Irrelevant	.35 ^a (.27)	.01 ^b (.18)

Note. Means with different superscripts are significantly different ($p < .05$). Standard deviations are in parenthesis.

Table 6

Proportion Recalled as a function of Relevance and Age Group

Relevance	Young Adults	Older Adults
Relevant	.50 ^a (.27)	.29 ^b (.26)
Irrelevant	.25 ^b (.29)	.15 ^c (.24)

Note. Means with different superscripts are significantly different ($p < .05$). Standard deviations are in parenthesis.

Table 7

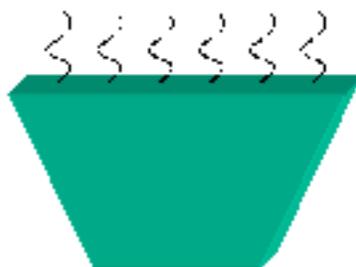
Proportion Recalled as a function of Endorser Type and Age Group

Endorser Type	Younger Adults	Older Adults
Famous	.47 ^a (.20)	.28 ^b (.20)
Nonfamous	.28 ^b (.16)	.16 ^c (.15)

Note. Means with different superscripts are significantly different ($p < .05$). Standard deviations are in parenthesis.

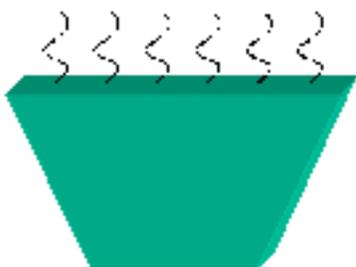
Appendix

Mike Tyson loves our gourmet soup!



- Easy-to-open, microwave-safe, single serving containers
- Every soup contains two servings of vegetables
- Enjoy a variety of soups like vichyssoise (cold potato soup)
- Comes with a reusable spoon.
- All natural with no preservatives

Will Jenkins' favorite lunch



- Single-serving soups made with adults in mind
- You will love our gazpacho!
- Low fat gourmet recipes
- Choose from 3 different sizes
- No added sodium (great for a low-salt diet)

Michael Jordan likes his clothes cleaned with our detergent

- New formula removes oil and grease stains without pretreatment



- Safe for your delicates
- Mountain fresh scent
- 100% hypoallergenic (No skin reactions)
- Safe for clothes that get washed everyday

Use the detergent that keeps Brian Tucker's clothes looking great

- Oil and grease stains are easily removed
- Won't let colors that bleed ruin your laundry
- Quick dissolve formula



- Whites get their white st and colors stay their brightest
- Softens as it cleans

The toothpaste of choice for Bill Gates



- New fluoride stops the development of canker sores
- Gel or paste formulas
- Easily refillable tube
- Large economy size refilling
- Available in six great flavors

Tom Dyer gets a great smile from this toothpaste



- Canker sores are a thing of the past with special fluoride!
- Brush before bed to stop morning breath
- Recyclable tube and cap
- Available in a compact tube perfect for traveling
- Try the extra large family size