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Picture–Text Incongruity in Print Advertisements among Low- and High-Literacy Consumers

While low-literacy consumers rely heavily on pictorial information when making market-based decisions, they also do attempt to read relevant information. When the advertisement picture and text are aligned, so too should be the conclusions low-literacy consumers draw. We ask what happens when the pictures and accompanying text are incongruent. Results of an experiment indicate that low-literacy consumers misinterpreted an advertisement with text–picture incongruity more regularly than did high-literacy consumers. Furthermore, low-literacy consumers demonstrated errors in comprehension that reflect picture-based processing. However, despite comprehension differences between low- and high-literacy consumers, attitudes toward the advertisement did not differ.

Research on marketing communications in general, and advertising in particular, is abundant. The interest in marketing communications is well deserved given that they play a vital role in consumers' decision-making processes (Heckler and Childers 1992). While theoretical understanding of the marketing communication process is critical, our understanding stems almost exclusively from research on highly literate consumers such as college students (Adkins and Ozanne 2005). While certainly with merit, the focus on highly literate consumers does not offer direct insight into the manner in which the thirty million low-literacy adults in the United States (U.S. Department of Education 2006) process marketing communications. As a result, there have been increased calls for research on the unique challenges faced by low-literacy consumers (Adkins and Ozanne 2005; Alba 2000; Wallendorf 2001).

Consistent with extant research in marketing, we consider low-literacy consumers to have reading skills at or below a sixth-grade level (Adkins

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and Ozanne 2005; Jae and DelVecchio 2004).¹ Better understanding of low-literate consumers is valuable from the perspective of marketing organizations and public policy makers. For marketers, low-literacy consumers represent a sizable part of the U.S. economy with an estimated annual purchasing power of up to \$380 billion (Viswanathan, Rosa, and Harris 2005). Understanding how this consumer segment processes information can allow marketers to better tailor communications. From a public policy perspective, the lack of research raises the issue of whether low-literacy consumers receive proper protection. The Federal Trade Commission's guideline for deceptive or misleading advertising suggests that advertising must be considered from the perspective of the "reasonable consumer" (FTC 1983). Given that low-literacy consumers read below sixth-grade level, it is questionable whether they are considered "reasonable" consumers who have the capability to screen out deceptive advertising. Thus, this population may be excluded from protection from deceptive advertising practices. We therefore endeavor to (1) identify if the writing in advertising largely excludes comprehension by low-literacy consumers and, if so, (2) track the outcomes of lower levels of comprehension.

The few studies that appear in the marketing literature regarding low-literacy consumers conclude that low-literacy adults display unique coping strategies to compensate for their lack of literacy. One coping strategy low-literacy adults use to make purchase decisions is to rely heavily on pictorial information (Jae and DelVecchio 2004). Such a coping strategy may be practical or necessary but may not always be beneficial, particularly if advertisements are not designed for consumers with limited reading abilities. This research combines disparate findings in consumer behavior, advertising, and reading literatures to suggest that common approaches to advertising or communicating in the marketplace are potentially harmful to low-literacy consumers. Specifically, the current research considers the effect of a picture that is incongruent with accompanying text in a printed advertisement (Houston, Childers, and Heckler 1987). Based on our findings, we offer specific recommendations for managers and policy makers.

1. There are other terminologies used to represent the concept of low literacy. Adults with similar skills have also been termed functionally illiterate (Viswanathan, Rosa, and Harris 2005) in marketing literature. In reading literature, people who have never attended school and have had minimal exposure to print in any social context are identified as nonliterate or illiterate (Sabatini 1999). People who have been raised in a literate society and have most likely attend school, but for various reasons have not completed their formal education, are considered low-ability readers (Bell and Perfetti 1994). Within the low-ability grouping, resides subpopulations of readers who are dyslexic (Perfetti 1985) or are learning disabled (Kirsch et al. 1993).

CONCEPTUAL BACKGROUND AND HYPOTHESES

Literacy and Reading Comprehension

An obvious strategy for low-literacy consumers when making consumption decisions is to rely strictly on verbal information, be it television or radio advertising, advice from a salesperson, or a recommendation from a friend. For very low-literacy consumers, this may be a necessary strategy. However, most low-literate consumers are able to read to some extent and, in turn, choose to read both for leisure and for necessity. In a study on the reading habits of low-literate adults, Askov and Forlizzi (1989) reported that, in addition to the likes of bills and prescriptions, items mentioned as those read out of necessity included ads, product packages, and coupons. If written in simple enough terms, low-literacy consumers will be able to comprehend marketing messages.

To assess the complexity of marketing communications to which low-literacy consumers may be exposed, we randomly selected fourteen ads each from *Easyriders* and *SoapOperaWeekly* magazines. *Easyriders* and *SoapOperaWeekly* were chosen due to their high rates of readership (indexes of 136 and 121, respectively) by people with less than a high school education (MRI+ Mediamark Internet Reporter 2006). Fourteen ads represent all the unique nonclassified ads from two issues of *SoapOperaWeekly*. The fourteen ads from *Easyriders* were randomly selected (every fourth ad). The text in the ads was transcribed into Microsoft Word and the Flesch-Kincaid reading level was calculated for each advertisement. The average ad in the two magazines was written at a 7.6th grade level, which is significantly higher than the sixth-grade reading ability possessed by the most literate of the low-literacy group ($t = 3.01, p < .05$).

Given the apparent gap between marketing communications and the reading ability of low-literacy consumers, we turn to literature in reading to understand how such communications will be processed by low-literacy consumers. In so doing, we focus on print advertisements written at a grade-level at the cusp of the ability level of low-literacy readers. Subsequent discussions of print advertisements should be understood to mean those written at this level or higher.

The reading process is undertaken in the reader's working memory (Perfetti 1985). Working memory is a limited-capacity system (Daneman and Carpenter 1980). For readers of low ability, a disproportionately high amount of working memory capacity is devoted to word-level encoding and decoding (Just and Carpenter 1992). As a result, less working memory capacity is left to be devoted to sentence- or paragraph-level decoding

resulting in lower text comprehension, an outcome evident in existing research (e.g., Jae 2006). Of particular interest is how the inclusion of a picture that is incongruent with ad text will affect comprehension.

Literacy and Pictures

Research indicates that low-literacy consumers rely heavily on pictorial cues to compensate for their working memory deficits (Jae and DelVecchio 2004; Viswanathan, Rosa, and Harris 2005). Pictures often enhance text comprehension (Levin 1981) and can help readers perceive, understand, and remember text information (Levie and Lentz 1982). Among bilingual consumers, strong agreement between picture and text in advertising facilitates second-language processing and increases memory of the content (Luna and Peracchio 2001). Thus, it would appear that the reliance on visual cues may be a positive adaptation for low-literacy consumers if there is high picture–text congruity.

Our focus is on how processing is affected when there is text–picture *incongruity*. Images serve a broad array of purposes in ads. For instance, images can be used to attract attention, indicate the target audience, position the brand, communicate product benefits or features, or create positive affect (O’Guinn, Allen, and Semenik 2003). To achieve these diverse objectives, advertisers often use images that are incongruent with the ad’s written message (Heckler and Childers 1992; Schmitt, Tavassoli, and Millard 1993). Research indicates that such incongruity may decrease message comprehension among consumers with limited working memory capacity. For instance, Willows (1978) reported that children attempt to use unrelated pictures as clues to the meaning of unfamiliar words, thereby interfering with comprehension. Similarly, Sanchez and Wiley (2006) found that incongruent pictures presented along with text passages interfered with text processing by college students with low working memory capacity. Such interference should lower text comprehension in a manner that is biased toward the message conveyed in the picture. We therefore predict that when presented with an ad with picture–text incongruity, low-literacy consumers will demonstrate lower message comprehension than high-literacy consumers due to errors that display greater picture-consistent confusion.

H1: An ad with incongruous text and picture will result in low-literacy consumers demonstrating a) lower levels of *comprehension* of the ad than high-literacy consumers by b) displaying errors in a manner that demonstrates picture-based processing confusion.

Reading Comprehension and Attitude

Conventional wisdom in advertising is that an advertiser should keep messages “short and simple” (Macklin, Bruvold, and Shea 1985). This advice is based on the recognition that if text is less comprehensible, consumers are less likely to experience elaboration, which impacts attitude formation (Petty, Cacioppo, and Kasmer 1988). However, because low-literacy consumers rely heavily on pictures in their marketplace behavior (Jae and DelVecchio 2004; Viswanathan, Rosa, and Harris 2005), their low levels of comprehension may not necessarily transform into low levels of cognitive elaboration. Conversely, individuals who can comprehend the text may view an ad with picture–text incongruity as being misleading and therefore may have less positive attitudes toward the advertisement. In a study that contrasted college graduates with people who had less than a high school education, Lepkowska-White and Parsons (2001) found that higher reading comprehension of product warning statements translated into less positive attitudes toward the warning when the warning statement was written using difficult text. Lepkowska-White and Parsons attribute this outcome to the belief that consumers feel that difficult-to-read warnings are poorly constructed. We expect a similar outcome in an advertising context. Specifically, consumers’ attitudes toward an ad with picture–text incongruity should be negatively related to their comprehension of the ad since greater comprehension makes the incongruity more recognizable. Thus, we predict:

H2: When a print advertisement contains text–picture incongruity, a) low-literacy consumers will have more positive attitudes toward the ad than will high-literacy consumers and b) this outcome will be mediated by ad comprehension.

METHOD

Sample

Eighty-five individuals participated in this study. High-literacy subjects ($n = 44$) were recruited from a university business school subject pool. Each subject received one research credit for participating. Low-literacy subjects ($n = 41$) were recruited from five literacy centers in the commonwealth of Kentucky. All the participants were native-born Americans who speak English as their first language. Each low-literacy subject received \$5 for participating. See Table 1 for additional details of the sample.

TABLE 1
Sample Profile

	Age, Mean (SD)	Gender, <i>n</i>	Reading Grade Level, Mean (SD)
High literacy (<i>n</i> = 44)	21 (2.85)	Male, 18; female, 26	11.28 (0.42)
Low literacy (<i>n</i> = 41)	32 (12.44)	Male, 21; female, 20	3.76 (1.00)

In order to assure correct literacy classifications, we assessed each respondent's literacy level via the standardized Reading Level Indicator: A Quick Group Reading Placement Test (2000), a tool that is commonly used in research to assess reading ability (Irvin 2005; Steenford 2000). Since the Reading Level Indicator score (which can range from 1 to 40) has only relative meaning, it was converted to a reading *grade* level according to published guidelines. The result, which can range from 1.9 to 11.4, allows for interpretation for those unfamiliar with reading literature (and the meaning of the Reading Level Indicator scores). For our sample, the reading grade level was significantly lower for the low-literacy respondents than for high-literacy respondents ($M_{\text{low literacy}} = 3.76$ versus $M_{\text{high literacy}} = 11.28$, $t = 43.60$, $p < .001$). In addition, there was no overlap in score between the groups as each high-literacy respondent scored above the ninth-grade level (range = 9.7–11.4) and each low-literacy respondent scored below the sixth-grade level (range = 1.9–5.8).

Stimulus

An actual product advertisement from a detergent company Web site was adapted to create the stimulus for the study (Figure 1). The advertisement was written at a sixth-grade level. This level of difficulty was appropriate as it should have been challenging for low-literacy respondents (who all read at a level below the sixth grade) and relatively easy for high-literacy respondents (who all read at a level above the sixth grade) to process. Furthermore, it was not so difficult as to completely dissuade low-literacy respondents from attempting to read the text.

The stimulus ad includes a picture of a mother and child that is incongruous with the disclaimer in the ad copy stating that the product is not suitable for children's sleepwear. A pretest in which university business undergraduate students ($n = 22$) rated picture relevance to the text on a 5-point scale (e.g., Heckler and Childers 1992) adds support to the claim that the picture and text are incongruous (mean = 2.13, t relative to scale midpoint = -4.09 , $p < .001$).

FIGURE 1
Stimulus



Soft as a Mother's Love[®]

Field Flower[®]

There's nothing like the line-dried freshness of clothes hanging in the breeze. Now you can have that fresh scent everyday with Suavitel Field Flower*

Suavitel Field Flower gives your clothes a fresh scent and all the softness your family loves.

*Not intended for use on children's sleepwear or other flame-resistant garments as it may reduce flame resistance.

Procedure

Data were collected from respondents in groups of two or three to alleviate stress that may have arisen from being the lone respondent while still allowing the respondents, particularly the low-literacy participants, to feel free to ask any clarifying questions. Due to the low-literacy participants' limited reading ability, the investigator verbally read all the instructions and questions to the low-literacy respondents. An important exception was the Reading Level Indicator since the test determined the participants' reading grade level. In addition, to ensure proper scale use, the multipoint response scales used to respond to statements about the advertisement were demonstrated to the low-literacy respondents in a practice session.

Managing differences between low- and high-literacy groups during data collection required trade-offs. While consumer researchers are beginning to use conventional scale items to survey low-literacy consumers (Viswanathan and Gau 2005), low-literacy adults frequently lack experience answering surveys, using scale items, and answering multiple-choice

questionnaires. Therefore, it seemed necessary to read the items to them and engage them in a practice session on scaled responses. However, the differential experimental administrations between low- and high-literacy respondents have the potential to distort the results.

In the experiment, respondents were instructed to review the product advertisement. Next they answered three comprehension statements, each in the form of a multiple-choice sentence completion task (Nation and Snowling 1997). Multiple-choice answers were rotated to preclude an order bias (Hair et al. 1998). Next, respondents indicated their attitude toward, and level of involvement with, the advertisement. Attitude toward the ad was measured by four items—a single 9-point scale item (very negative/very positive) used by Lowrey (1998) and three 9-point semantic differential scale items (liked/disliked, unpleasant/pleasant, enjoyed/did not enjoy) used by McQuarrie and Mick (1999). Involvement, which was measured to preclude differences in the amount of processing rather than the type of processing across literacy groups as an explanation for comprehension differences, was measured by three 7-point semantic differential scales anchored by “very involved/very uninvolved,” “concentrated very hard/concentrated very little,” “paid a lot of attention/paid little attention,” and a single-item agreement measure, “I carefully considered claims about the product in the advertisement” (Miniard et al. 1991). Finally, respondents completed the Reading Level Indicator and answered demographic questions. The relevant measurement items (except for the Reading Level Indicator which is copyright protected) are displayed in Appendix 1.

ANALYSIS AND RESULTS

Before testing the hypotheses we need to rule out differential levels of involvement with the ad as a driver of differences in comprehension. The involvement scale was reliable for both high- ($\alpha = .874$) and low-literacy participants ($\alpha = .969$), and an independent samples *t*-test revealed no significant difference between the two groups for this construct ($M_{\text{high literacy}} = 5.23$ versus $M_{\text{low literacy}} = 4.87$, $t = 1.109$, NS).

Comprehension of the Ad

Hypothesis 1 predicted that low-literacy consumers would display lower levels of comprehension of a print advertisement and that errors in comprehension would reflect picture-based processing. Comprehension of each individual item was scored as zero if the response was incorrect and one if correct (Hoyer, Srivastava, and Jacoby 1984). A summary score was then

formed for the comprehension items. An independent samples *t*-test revealed that low-literacy consumers displayed significantly lower comprehension ($M_{\text{low literacy}} = 1.95$ versus $M_{\text{high literacy}} = 2.89$, $t = 5.64$, $p < .01$).

The result supports H1a. More interesting, however, is whether errors in comprehension reflect picture-based processing (i.e., H1b). To assess H1b, a picture-based processing variable was formed by recoding the comprehension items as a one for errors in comprehension in which the response is consistent with the picture of mother and child (e.g., responding that the product is best for washing baby sleepwear in response to the first comprehension question) and a zero otherwise. An independent samples *t*-test indicated that low-literacy respondents displayed more picture-consistent errors than did high-literacy respondents ($M_{\text{low literacy}} = 0.76$ versus $M_{\text{high literacy}} = 0.07$, $t = 4.66$, $p < .001$). In fact, low-literacy respondent errors were significantly more likely to reflect pictorial processing (72% of all errors) than not (28%, $z = 4.08$, $p < .05$).

Attitude toward the Ad

Hypothesis 2 predicts that when a print advertisement contains text–picture incongruity, low-literacy consumers will have more positive attitudes toward the ad due, at least in part, to a lower level of ad comprehension. The ad attitude scale is reliable for both high-literacy ($\alpha = .922$) and low-literacy participants ($\alpha = .965$). The score from four items was summed and averaged for the analysis. An independent samples *t*-test revealed that attitude toward the ad did not differ across the literacy groups ($M_{\text{low literacy}} = 6.00$ versus $M_{\text{high literacy}} = 5.73$, $t = .661$, NS). Thus, H2a was not supported. Failure to support H2a also precluded finding support for the mediating role of comprehension in determining ad attitudes. This outcome may be based on the uniformly high level of comprehension across high-literacy respondents as only 4.5% of the responses given by the high-literacy group reflected a lack of comprehension. Comprehension may affect the formation of ad attitudes within the low-literacy subsample (i.e., as comprehension increases attitudes become less positive for low-literacy respondents). However, correlation analysis indicated no relationship between comprehension and attitude among the low-literacy participants ($\gamma = .077$, $p > .05$).

IMPLICATIONS

Prior research on low-literacy consumers found that pictorial information plays a significant role in consumer decision making (Jae and DeIV-ecchio 2004; Viswanathan, Rosa, and Harris 2005). The current research

extends knowledge in this area by suggesting that pictures in print advertisements, particularly when incongruent with ad text, may degrade comprehension among low-literacy consumers. Moreover, and potentially of negative consequence for low-literacy consumers, the lower levels of comprehension exhibited by low-literacy participants were not associated with less positive attitudes toward the advertisement.

The type of error exhibited in our study is informative when considering of the potential negative consequences of miscomprehension without associated attitude degradation. Despite text that warns against use on children's sleepwear, nearly a third (32%) of the low-literacy respondents indicated that the detergent was suitable for children's sleepwear (i.e., selected response "b" for comprehension question 2). The same error was not made by any of the high-literacy participants. Furthermore, this lack of comprehension was exhibited for an ad written at a sixth-grade level—a level that is below that of the average ad in two magazines (*Easyriders* and *SoapOperaWeekly*) with disproportionately high readership rates among the less educated. The clear managerial implication is for advertisers to better tailor advertisements to the ability of their target market. In particular, they should be aware that pictures are potentially harmful in print advertisements—especially when the pictures are incongruent with the text. For example, an advertiser might help low-literate consumers heed the warning by adding the universal "no" symbol—a red circle with a line drawn through the middle. In this case, the no symbol could be superimposed on an image of children's clothing.

The research design involved a single advertisement, so additional research is needed to test whether decorative or congruent pictures, or even the absence of a picture, will affect comprehension in similarly negative ways. For example, in the absence of a picture, it is possible that the readers could also find the headline "A mother's love" to contradict the disclaimer that the product is not intended for use on children's sleepwear.

From a public policy perspective, the confusion of low-literacy respondents may suggest that the advertising was misleading or deceptive. However, the Federal Trade Commission's three-prong assessment of misleading or deceptive advertising does not consider the varying level of literacy ability among consumers. Rather, the FTC (1983) states that (1) there must be a representation, omission, or practice that is likely to mislead the consumer; (2) the act or practice must be considered from the perspective of the reasonable consumer; and (3) the representation, omission, or practice must be material.

The results of the current study indicate that reasonable consumers (high-literacy participants) did not misinterpret the product's use and thus the advertisement was not misleading. Using this argument, however,

ignores the consumer protection needs of a vulnerable market segment (low-literacy consumers). Public policy makers and influencers should urge the FTC to offer such protection—perhaps by clarifying the notion of a reasonable consumer.

APPENDIX 1

Comprehension

1. This product is the best for washing _____.
 - a) Baby’s sleepwear
 - b) Clothes needing a fresh smell
 - c) Carpets
2. This product brings the best result for _____.
 - a) Flame-resistant clothing
 - b) Children’s sleepwear
 - c) Non-flame-resistant clothing
3. You cannot use this product on some occasions because _____.
 - a) It reduces flame resistance.
 - b) It makes the clothing dry slower.
 - c) It is only for baby’s clothing.

Attitude toward the Advertisement

What is your overall feeling toward the advertisement?

Very Negative	1	2	3	4	5	6	7	Very Positive
Did Not Like	1	2	3	4	5	6	7	Liked
Unpleasant	1	2	3	4	5	6	7	Pleasant
Did Not Enjoy	1	2	3	4	5	6	7	Enjoyed

Scale Source: Lowrey (1998) and McQuarrie and Mick (1999).

Involvement

What is your overall feeling toward the task?

Not Involved	1	2	3	4	5	6	7	Very Involved
Concentrated Very Little	1	2	3	4	5	6	7	Concentrated Very Hard
Paid Little Attention	1	2	3	4	5	6	7	Paid a Lot of Attention

I carefully considered claims about the product in the advertisement.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree
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Scale Source: Miniard et al. (1991).

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