EXPLORING ANCHORING AND COMMUNICATION EFFECTS FROM MESSAGE MANIPULATION: AN EXPERIMENTAL STUDY ABOUT RECYCLING

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ABSTRACT

How to change the cognition, attitude and behavior of a target audience toward a public issue that improves the welfare of society is an interesting topic in social marketing. Properly manipulating anchor positions to strengthen communication with a target audience has been demonstrated as an effective approach in commercial marketing. We propose to explore how applying the confirmed commercial marketing model to a specific social marketing issue (i.e., controlling messages with an anchor to influence the evaluations of a target audience about an unknown quantity - the rate of recycling) and to test whether this approach improves the effects of communication meant to adjust attitudes and behaviors toward recycling. Two experiments show that anchored advertising messages significantly change the estimates of a target audience regarding recycling. Advertising messages with high or low anchors motivate subjects to support recycling, but not ostensibly, which is contrary to other behaviors of personal benefit.

Keywords: social marketing, anchoring effect, communication effect, recycling

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INTRODUCTION

Social works are increasing in both developing and developed countries. Establishing and disseminating positive ideas to the public, and to smoothly transfer those ideas for improving community welfare to action, is crucial for a mature society. Kotler and Levy (1969) encouraged the application of marketing concepts and skills usually employed by commercial firms, related to product, pricing, distribution, and communication, to non-business organizations that drive civic and non-profit issues. Kotler and Zaltman (1971) pioneered the study of the link between social marketing and “Planned Social Change”. It is important that non-business organizations implement the exchange processes effectively and efficiently to “sell” ideas to target audiences (Kotler, 1975, 2005). Many studies about applying marketing techniques to social issues have been completed since that time. The ultimate purpose of all social marketing, however, is to influence the attitudes and behaviors of target audiences, regardless of the approach (Fox & Kotler, 1980; Maibach, 1993; Hassan, Walsh, Shiu, Hastings, & Harris, 2007; Brennan & Binney, 2010; Dann, 2010). Effectively manipulating information to change attitudes and behaviors is important to social marketing, even though different terms were used in the literature depending on various applications, such as social advertising (Fox & Kotler, 1980), stimuli (Fraser, Hite, & Sauer, 1988), strategic communications (Andreasen, 2002), or social messages (Hassan et al., 2007).

One essential topic among information approach contexts is the role of anchors in social marketing communication that have been investigated and verified as successful in persuading consumers, such as in commercial marketing (Northcraft & Neale, 1987; Kahneman, 1992; Maibach & Cotton, 1995; Pechmann & Reibling, 2000). The procedure of how anchors compare with reference points to affect the evaluations of a target audience about an unknown quantity has been explored in several marketing-relevant subjects (Kahneman, 1992; Wansink, Kent, & Hoch, 1998; Kristensen & Gärling, 2000; Jonas, Greitemeyer, Frey, & Schulz-Hardt, 2002). However, little research has discussed the manipulation of messages with anchors to
change evaluations and, in turn, strengthen the communication effects in social marketing, which is inherently more complicated than commercial marketing (Andreasen, 2002; Bennett & Sargeant, 2005). The relationships between anchors, reference points, and communication effects as people face social topics are still unclear. Because recycling is an important issue related to environment protection, improving recycling behavior is a prototype problem in social marketing (Scott, 1999; Do Valle, 2005; Timlett & Williams, 2008; Prestin & Pearce, 2010). We therefore explore methods for applying the commercial marketing model that has been thoroughly studied on a specific social marketing issue: using anchors to control messages to influence the evaluations of a target audience about an unknown quantity (viz., the rate of recycling) and test whether this approach improves the communication effects in adjusting public attitudes and behavior intentions toward recycling.

LITERATURE REVIEW

Social Marketing

Kotler and Zaltman (1971) formally initiated the application of marketing concepts and techniques to social rather than commercial objectives. People with inappropriate behaviors or habits under dominant societal disciplines can improve their personal welfare and the welfare of society as a whole if they change behaviors toward a more positive result (Andreasen, 1995; Bennett & Sargeant, 2005). Examples of behavior change promoting public well being (which is treated as a product by social marketing), including HIV prevention and sexual responsibility (Reichert, Heckler, & Jackson, 2001; Lombardo & Leger, 2007), anti-smoking campaigns (Pechmann & Reibling, 2000; Pechmann, Zhao, Goldberg, & Reibling, 2003; Song & Glantz, 2008), drunk driving prevention (Dula, Dwyer, & LeVerne, 2007; Cismaru, Lavack, & Markewich, 2009), pollution prevention (Fuller & Ottman 2004; Barr, 2007), and recycling (Scott, 1999; Do Valle, 2005; Prestin & Pearce,
2010), have been studied extensively, attesting that social marketing is broadly accepted by the academic and practical sides of research.

Nevertheless, following prosperous development during its first three decades, bifurcated from commercial marketing, social marketing still faces barriers to appreciation by top management levels, brand positioning, documentation and publicity of successes, and academic stature (Andreasen, 2002). The barriers originate partly from an abundance of definitions causing social marketing to lose a clear position compared with other approaches to social change not recognized by other research (e.g., Stead, 2007). The investigation of causes of failed approaches to social change indicates that marketing problems are frequently the main factor in failure, rather than the capability of non-profit organizations to process social issues (Bennett & Sargeant, 2005). A recent trial to clarify definitions of social marketing by integrating contemporary commercial marketing theory and practice and prior work in social marketing resulted in “the adaption and adoption of commercial marketing activities, institutions and processes as a means to induce behavioral change in a targeted audience on a temporary or permanent basis to achieve a social goal” (Dann, 2010). No matter how social marketing is evolving, as one of alternatives for social change, the eventual objective may always be to induce positive behavioral change instead of just promoting ideas (Fox & Kotler, 1980; Maibach, 1993; Andreasen, 2002; Hassan et al., 2007; Dann, 2010).

**Anchoring Effect and Reference Point**

Psychologists have found that people autonomously adjust their estimates from given initial points toward uncertain quantities and named the initial points as anchors (Tversky & Kahneman, 1974). Though the final estimations depend on the positions of anchors and degrees of uncertainty and the adjustments are usually insufficient, average estimates approach real values in many situations, even if the given anchors are far from real values (Slovic & Lichtenstein, 1971; Tversky & Kahneman, 1974; Northcraft & Neale, 1987). People usually make higher estimations from a high
anchor and lower estimations from a low anchor. For example, two groups of subjects estimated the percentage of African countries in the United Nations by given different random numbers between 0 and 100. The subjects of one group made an upward median estimation of 25%, with 10% as a given starting point, while subjects of another group made a downward median estimation of 45%, with 65% as a given starting point (Tversky & Kahneman, 1974; Jonas et al., 2002). Northcraft & Neale (1987) demonstrated that both amateur (students) and expert (real estate agents) subjects estimated residential real estate sales toward given listing prices treated as anchors. In research about solicitation campaigns, Fraser et al. (1988) found that donations increase as an anchor grows from a lower to a higher position (i.e., request for a large donation) included in a solicitor’s presentation, but the probability of contribution decreases. The locations of anchors change the behavior of people. Subjects will adjust their estimates toward self-generated anchors if they lack context (Epley & Gilovich, 2001). In the case of a given anchor, people spontaneously estimate closer to the anchor. For example, most European countries converted to the Euro in 1999, resulting in lower nominal values. Germans therefore perceive a product costing 50 Euro as cheaper than the identical product tagged as 100 German Mark (DM), though the purchasing powers of the two currencies, with a conversion rate of approximately 1 Euro to 2DM, are exactly the same. The DM plays as a high anchor so that German citizens overestimate product price in Euros before they are comfortable with the new currency (Jonas et al., 2002).

On the other hand, the reference point frequently stated in negotiation articles is a neutral position of status quo when people separate the evaluations into “desirable outcomes (gains) and undesirable ones (losses)” (Kahneman, 1992). One of the important characteristics of a reference point is that alternatives classified as a loss are weighted differently than alternatives classified as a gain. For example, Kristensen and Gärling (2000) argued in their research of price negotiation that the reservation price of buyers is the reference point and the offer of the seller is the anchor. The anchor is perceived as a loss if it is higher than the reference point and the adjustment from anchor (counter-offer) is larger. The anchor is perceived as a gain if it is lower
than the reference point and the adjustment from the anchor is smaller. Nevertheless, the definition of loss or gain, depending on the relation between anchors and reference points, may reverse in other cases. For example, a salary offer of $40,000 is a gain if the current income (reference point) is $30,000, but $40,000 is a loss if the current income is $50,000 (Kahneman, 1992). The decreasing salary is regarded as an increased loss and is more painful than a gain. We employ the gains versus losses idea to understand the anchoring effect on pro-environmental behaviors, such as recycling. For example, people will live in a cleaner and healthier environment (gains) if they recycle, but they will pay costs and face exposure to toxic air (losses) if they do not recycle (Pelletier & Sharp, 2008).

As a result, the current study proposes a mechanism to interpret how a given message that includes an anchor affects the evaluations of a target audience compared to their reference points. The target audience may or may not have initially perceived an explicit rate of recycling measured by percentage as a reference point. By giving a deceptively low rate of recycling as an anchor, a target audience will recognize the serious environmental crisis, perhaps because of trash accumulation, and significantly adjust their estimates of the rate of recycling toward the low anchor to confirm their anxiety. On the contrary, if a target audience observes an illusory high rate of recycling as an anchor, they feel comfortable with the treatment of trash and unconsciously move their estimations of recycling rate toward the high anchor to strengthen the environmental protection movement. The first hypothesis is as follows:

**H1:** Communicating a message with an anchor will have a significant positive effect on the estimates of a target audience.

**Communication Effect**

Numerous social marketers believe that social marketing should focus on changing public attitude and behavior. Marketers want their target audience “to know,
believe, and do” for a specific social goal (Kotler & Roberto, 1989; Kotler & Lee, 2008). Effective communication with people comprising three sequential consumer-response stages, cognition, affection, and behavior, is an important procedure for a target audience to support a certain public issue (Kotler, 2000). Numerous contexts show that effective communication via coherent advertising messages is a key success factor in changing public attitude and behavior regarding recycling (Shrum, Lowrey, & McCarty, 1994; Mee, Clewes, Phillips, & Read, 2004; Timlett & Williams, 2008). There have been several theoretical frameworks for the learn-feel-do procedure of consumers. One of the most commonly employed models in research on environmental cognition is the Theory of Reasoned Action: that communication effects with receivers can be measured by a cognitive process containing the three dimensions of beliefs, attitudes, and behavior intentions (Fishbein & Ajzen, 1975; Toy, 1982; Barr & Gilg, 2005).

Communication effects are measured by degrees of change in knowledge, attitudes, and behavior after a target audience recognizes specific communicated messages (Huang, 2004). Pro-environmental behavior, such as recycling, is decided by the desire to do, called behavior intentions, which are influenced by attitudes toward recycling. The attitudes are combinations of expected outcomes and the judgments of outcomes for a certain behavior, e.g., recycling reduces waste and alleviates environment pollution (Barr & Gilg, 2005). The active thoughts or cognitions of individuals as they accept persuasive messages perform as mediators of attitude formation or attitude change, e.g., recycling helps the environment and should become a required movement by social norm regardless of personal intentions (Toy, 1982). Consequently, manipulating appropriate advertising messages may influence the communication effects within a target audience and, in turn, cause changes in behavior. While true advertising value comes from communication exchange between consumers and advertisers, advertising itself satisfies or even exceeds the expectations of consumers. It has been justified that advertising messages influence commercial effect, yet an effective message varies for different product categories (Laskey, Fox, & Crask, 1995; Ducoffe, 1996).
According to the literature about the elaboration likelihood model, attitudes formed as a result from a subject’s industrious examination of information, which is called by means of central route, possess stronger persistence and resistance as well as predict behaviors more consistently (Petty, Cacioppo, & Schumann, 1983). On the other hand, people who have little personal involvement in a specific issue and are unable to consider supplied message carefully induce an attitude change via the peripheral route (Petty et. al., 1983; Cacioppo & Petty, 1984). Consequently, subjects may autonomously adopt a central route to process an anchored message and cause better communication than subjects experiencing straightforward inspiration to implement a peripheral route to think about a message without an anchor. In addition, both the pre- and post-communication beliefs and attitudes have to be measured to determine the faithful communication effects (Toy, 1982). To change a specific public idea that belongs to a product category in social marketing, we observed that three dimensions of effective communication, cognitions, attitudes, and behavior intentions, vary when subjects are given advertising messages that include anchors to evaluate the communication effects. Our second hypothesis is as follows:

H2: Communicating anchored messages results in better communication effects in a target audience than messages without an anchor.

In social psychology research, advertising messages classified as positive emphasize the benefits of adopting a specific behavior. Advertising messages defined as negative emphasize the costs of not adopting the behavior (Salovey & Williams-Piehota, 2004; Young, 2008). Studies about how positive or negative advertising messages alter the cognitions, attitudes and behavior intentions of subjects toward a particular issue have found divergent results. For research into reducing drunk driving, Cismaru et al. (2009) reported that negative messages conveying severity and vulnerability significantly raise audience behavior intentions. Pechmann et al. (2003) found that negative message themes, such as endangering others,
suffering disease and death, and the negative life circumstances of smokers increase
the cognitions of adolescents that smoking is subject to severe social disapproval risks,
thus strengthening the intention of adolescents not to smoke. The communication
effects nevertheless would be more persuasive if social marketers supply more
attainable, low cost and confident advice for people, in addition to strategies
referencing fear for other social issues. Messages communicating intensified personal
and environmental benefits, positivity, and optimism increase the likelihood that
people will support pro-environmental behavior because they are encouraged instead
of threatened to do so (Pelletier, Dion, Tuson, & Green-Demers, 1999; Timlett &
Williams, 2008). Menese (2010) also verified that recycling behavior is associated
more with messages causing positive emotions rather than negative emotions. There is
common agreement that any scheme promoting recycling behavior to achieve higher
recycling rates should be shaped as a positive social norm, while activities that decline
recycling are unacceptable and portrayed as a negative image (Hopper & Nielsen,
1991; Martin, Williams, & Clark, 2006; Timlett & Williams, 2008; Menese, 2010).

To control messages with numeric anchors to examine variations of
communication effects, we propose that a high rate of recycling has a positive appeal
to attract people to environmental conservation, consequently achieving more public
benefits, while a low recycling rate has a negative appeal to frighten the public, such
as enduring a possible environmental crisis and paying unavoidable costs if they fail
to recycle. As a result, our third hypothesis is as follows:

**H3:** Communicating messages with a high anchor results in better
communication effects in a target audience than messages with a low
anchor.
EXPERIMENT 1

Pretest

A pretest was carried out with 36 randomly sampled undergraduate students from a university in south Taiwan. Since we concentrated on observing the effects caused by manipulating messages with or without an anchor instead of other variables, such as gender, age, occupation, income, and nationality, the selected sample ensured as low a variance as possible between the measurements perceived by the same scale for different subjects. We asked participants to complete a questionnaire to measure their cognitions, attitudes, and behavior intentions regarding recycling without referencing a rate of recycling. On the same questionnaire, we then asked subjects to approximate the recycling rate, showing a credible interval of recycling rate according to their beliefs, and identify open intervals of excessive low or high recycling rate for which they don’t believe. Based on the pretest results, we checked the understanding of the questionnaire on the part of the subjects, testing whether our tool measured the anchoring and communication effects properly, and performed adjustments for semantic differential items.

<table>
<thead>
<tr>
<th>Estimated Recycling Rate (%)</th>
<th>0-10</th>
<th>11-20</th>
<th>21-30</th>
<th>31-40</th>
<th>41-50</th>
<th>51-60</th>
<th>61-70</th>
<th>71-80</th>
<th>81-90</th>
<th>91-100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>0</td>
<td>4</td>
<td>12</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The frequency distribution of the pretest in TABLE 1 shows an uncertain bimodal estimate of the rate of recycling by the subjects. The two peak estimates are located on 21% - 30% and 61% - 70%. There are various definitions of high or low rates of recycling depending on the policies of individual states and the defining characteristics of researchers. Descriptions of high or low rates of recycling are
relative rather than absolute in much of the research on recycling. For example, Martin et al. (2006) described a low recycling rate of 6% of household waste in some communities in the U.K. Chowdhury (2009) reported that some European countries have high recycling rates, such as the Netherlands (64%) and Austria (59%). According to the 2008 Annual Report for Recycling published by TAIWAN’s Environmental Protection Administration\(^3\), the recycling rates were 15.55%, 17.89%, 20.13%, 23.12%, 27.72%, 29.97%, and 32.21% from 2002 to 2008, respectively. To manipulate messages with or without anchors, we must establish deceptively low and high recycling rates as anchors to be contained in the manipulated messages. These deceptive anchors, however, should not be set too far away from the fact. Hence, we choose the manipulated recycling rate (anchor) 27% and 75% as low and high recycling rate by comparing the above frequency distribution with the subjects’ average unacceptable open intervals of the rate of recycling, and recycling relevant literature and report.

**Design**

To manipulate various messages with an anchor to examine changes in the estimates of the rate of recycling and changes in the communication effects, a simple and highly controlled experiment was performed in which subjects received persuasive messages contrasting their beliefs. The experiment had a within-subject design with only one manipulated factor, the message with or without an anchor. Referring to pretest results, manipulated messages included recycling rate of 27% and 75% as low and high anchors, respectively. Two experimental communications were conducted for each of two message groups in which subjects read sequential persuasive messages with and without anchors. We anticipated that the two conditions would exhibit distinct differences in the judgment of the rate of recycling and changes in cognitions, attitudes, and behavior intentions between the pre- and post-perception

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\(^3\) [http://waste1.epa.gov.tw/ier_web/](http://waste1.epa.gov.tw/ier_web/)
of the anchor for both message groups. FIGURE 1 shows the conceptual framework for Experiment 1.

![Conceptual framework for Experiment 1](image)

**FIGURE 1 Conceptual framework for Experiment 1**

**Subjects and Procedure**

We sampled 80 undergraduate students, half male and half female, from the same university as in pretest to participate in this study. The volunteers were sophomore or junior students picked from the College of Management and separated into male and female groups in which each student was given a unique number. Then 20 male and 20 female students were selected according to random numbers created by EXCEL, separately for male and female student lists, and assigned to one of the two experiment groups. The remaining 40 students were assigned to another experiment group. This procedure ensured a random assignment of subjects to the two message groups designated in the experimental design. The experimental procedure had two stages. In the first stage for GROUP A, subjects were told that their careful response in this study would help improve environmental conservation. Then they read a recycling-relevant advertising context and were asked to turn the context over and not refer back to it while the rest of the subjects finished reading the context. Subjects were then asked to complete a questionnaire that included items measuring
cognitions, attitudes, and behavior intentions regarding recycling and estimate about the recycling rate (0% ~ 100%) without giving a prompt to detect the initial position of the anchor. In the second stage, immediately following the end of first stage, participants were asked to repeat the procedure exactly the same as in the first stage, except the advertising context contained the following prompt message:

According to a survey by the Environmental Protection Administration, the recycling rate last year was 27%, showing that everyone can do more to protect our environment.

For GROUP B, the experimental process was identical to GROUP A, except that in the second stage, the advertising context contained a manipulated message with a recycling rate of 75% instead of 27%.

The independent variable is the persuasive message, with or without anchors, given in the advertising context and having values none to low, or none to high. The dependent variables are the anchoring effect, which is measured by a verbal statement, and the communication effect, which is measured by semantic differential items. For the verbal statement, subjects were asked to write down an estimate of the rate of recycling before and after being given the prompt messages with an anchor. For the cognitions, attitudes, and behavior intentions of subjects, various scales were used to measure the communication effect. To measure cognitions, subjects were asked “How do you feel about recycling after reading the advertising message?” to rate each of the three five-point semantic differential items. The items were important/unimportant, useful/useless, and informative/not informative (Batra & Ray, 1986; Coulter & Punj, 1999). The scale formed by the unweighted sum of these items had Cronbach's alpha of 0.71. The attitudes were measured by two five-point semantic differential items in response to the question, “What is your thought about recycling?” with scales favorable/unfavorable and like/dislike (MacKenzie, Lutz, & Belch, 1986; Coulter & Punj, 1999). The scale formed by the unweighted sum of these items had Cronbach's
alpha of 0.85. Finally, the behavior intentions were measured by two five-point semantic differential items in response to the question, “How much do you intend to adopt recycling?” with scales likely/unlikely and probable/improbable (MacKenzie et al., 1986). The Cronbach's alpha coefficients for behavior intentions were 0.77. All above confirms that the questionnaire had good intercrop relations in the items for each dimension.

Manipulation Test

To test the effectiveness of the message manipulation with or without an anchor, an item appearing in the questionnaire on the second stage read, “What recycling rate do you read in the previous context?” to assure that subjects received the manipulated anchor of the message. Any questionnaire lacking a response to this item was treated as an invalid sample. In addition, to make sure that the manipulated recycling rates 27% and 75% are indeed low and high anchors, respectively, for subjects, we performed one sample test for 27% recycling rates in GROUP A and 75% recycling rates in GROUP B in the second stage. The significant results (Mean = 46.5, SD = 16.6, \( t = 7.425, p = 0.000 \) for GROUP A; mean = 49.8, SD = 15.5, \( t = -10.25, p = 0.000 \) for GROUP B) show that the message manipulations with a low or high anchor are successful.

Results

We implemented \( t \) tests for paired and independent sample cases to inspect the anchoring and communication effects. The obvious distinction of estimated average recycling rates in GROUP A and GROUP B illustrates that the estimates of the subjects were affected by anchored messages, either low (TABLE 2; \( t = 3.72, p = 0.001 \)) or high (TABLE 3; \( t = -4.97, p = 0.000 \)). Subjects adjusted their estimates toward a lower recycling rate in GROUP A, from 46.50% to 38.55%, after they viewed the prompt message with a low anchor and toward a higher recycling rate in GROUP B, from 49.88% to 60.00%, after they recognized the prompt message with a
high anchor, certifying that the anchoring effect and hypothesis H1 is supported. Alternatively, the communication effect judged by cognitions, attitudes, and behavior intentions is not as significant as the anchoring effect in both GROUP A and GROUP B.

**TABLE 2 Paired t test for GROUP A in Experiment 1**

<table>
<thead>
<tr>
<th>Recycling</th>
<th>Message with Anchor</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimation of</td>
<td>None</td>
<td>46.50</td>
<td>16.61</td>
<td>3.72</td>
<td>0.001***</td>
</tr>
<tr>
<td>Recycling Rate</td>
<td>Low</td>
<td>38.55</td>
<td>12.15</td>
<td>-1.31</td>
<td>0.197</td>
</tr>
<tr>
<td>Cognition</td>
<td>None</td>
<td>4.38</td>
<td>0.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>4.46</td>
<td>0.55</td>
<td>-1.31</td>
<td>0.197</td>
</tr>
<tr>
<td>Attitude</td>
<td>None</td>
<td>3.26</td>
<td>0.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>3.31</td>
<td>0.43</td>
<td>-0.78</td>
<td>0.440</td>
</tr>
<tr>
<td>Behavior Intention</td>
<td>None</td>
<td>3.45</td>
<td>0.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>3.59</td>
<td>0.66</td>
<td>-1.60</td>
<td>0.117</td>
</tr>
</tbody>
</table>

*Note: *p < 0.05  **p < 0.01  ***p < 0.001

**TABLE 3 Paired t test for GROUP B in Experiment 1**

<table>
<thead>
<tr>
<th>Recycling</th>
<th>Message with Anchor</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimation of</td>
<td>None</td>
<td>49.88</td>
<td>15.50</td>
<td>-4.97</td>
<td>0.000***</td>
</tr>
<tr>
<td>Recycling Rate</td>
<td>High</td>
<td>60.00</td>
<td>14.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognition</td>
<td>None</td>
<td>4.54</td>
<td>0.56</td>
<td>-0.50</td>
<td>0.623</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>4.56</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>None</td>
<td>3.40</td>
<td>0.86</td>
<td>-0.90</td>
<td>0.376</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.51</td>
<td>0.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior Intention</td>
<td>None</td>
<td>3.65</td>
<td>0.74</td>
<td>-1.76</td>
<td>0.086</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.78</td>
<td>0.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: *p < 0.05  **p < 0.01  ***p < 0.001
The results show that although anchored advertising messages alter public perception about a social topic, the communication effects remain uncertain. The communication effects of advertising messages with a high or low anchor are not better than messages without an anchor, and hypothesis H2 is not accepted.

### TABLE 4 Independent $t$ test between GROUP A and GROUP B in Experiment 1

<table>
<thead>
<tr>
<th>Recycling</th>
<th>Message with Anchor</th>
<th>Mean</th>
<th>SD</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition</td>
<td>Low</td>
<td>4.54</td>
<td>0.55</td>
<td>0.50</td>
<td>0.618</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>4.48</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>Low</td>
<td>3.38</td>
<td>0.43</td>
<td>-0.41</td>
<td>0.683</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.44</td>
<td>0.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior</td>
<td>Low</td>
<td>3.69</td>
<td>0.66</td>
<td>0.08</td>
<td>0.939</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.68</td>
<td>0.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: * $p < 0.05$  ** $p < 0.01$  *** $p < 0.001$

Furthermore, the independent $t$ test results in TABLE 4 ($p = 0.618, 0.683, 0.939$) show that there are not significant differences of communication effects between GROUP A and GROUP B. The communication effect of an advertising message with a high anchor is not better than a message with a low anchor, hence hypothesis H3 is not verified.

### EXPERIMENT 2

The results in Experiment 1 support H1 and reject H2 and H3. We thus implemented a second experiment with different design to retest all three hypotheses.
Design

Experiment 2 was performed to avoid the potential learning effect in the within-subject design of Experiment 1. With the addition of a between-subject design, this experiment is basically the same as Experiment 1. Only one experimental communication was carried out for each of three message groups, in which subjects read persuasive messages with a high and a low anchor, as well as without an anchor. The three groups were expected to reveal obvious differences in estimates of the recycling rate and changes in the communication effect. FIGURE 2 shows the conceptual framework for Experiment 2.

Subjects and Procedure

Ninety undergraduate students from the same university as in pretest voluntarily participated in this experiment. As in Experiment 1, the sample students were given a unique number and assigned to a no-anchor, low-anchor, or high-anchor group, with 30 students in each of the groups according to random numbers created by EXCEL. Depending upon which of the three different categorical groups they were assigned to, subjects read a recycling relevant advertising context with a no-, low-, or high-anchoring prompt message, followed by completing a questionnaire and writing
their beliefs about the recycling rate, rather than seeing the figures presented by advertising context. All remaining details are exactly the same as the steps described in Experiment 1. The internal consistency for each of the dimensions for the communication effect is confirmed by Cronbach's alpha coefficients of Cognition (0.91), Attitude (0.89), and Behavior Intention (0.90). In addition to the consistent results under various experimental groups, there is one item appearing in the questionnaire for the low-anchor and high-anchor groups after subjects read the advertising context (i.e., “What recycling rate do you read in the previous context?”) to test that subjects perceived the anchor of the message manipulation. Any answer different from 27% in low-anchor group and 75% in high-anchor group was treated as an invalid sample.

Results

The TABLE 5 shows MANOVA results by which we conclude that various manipulated messages influence communication effects but not significantly. In order to investigate more of anchoring effects and relations between communicating messages and each dimension of communication effects, four one-way ANOVAs were completed to test the significance of the anchoring effects and the communication effects among the no-anchor, low-anchor, and high-anchor message groups. The significant difference between estimated average recycling rates demonstrates that manipulated messages containing no, low, or high anchors (recycling rate) affect target audience’s estimations (TABLE 6; $F = 33.614$, $p = 0.000$). The Scheffe’s test shows significant differences in recycling rate estimates in the descending order, high, none, and low.
TABLE 5 MANOVA for communication effects in Experiment 2

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pillai’s Trace</td>
<td>0.120</td>
<td>1.666</td>
<td>0.133</td>
</tr>
<tr>
<td>Wilks’ Lambda</td>
<td>0.880</td>
<td>1.701</td>
<td>0.124</td>
</tr>
<tr>
<td>Hotelling’s Trace</td>
<td>0.137</td>
<td>1.734</td>
<td>0.117</td>
</tr>
<tr>
<td>Roy’s Largest Root</td>
<td>0.137</td>
<td>3.555</td>
<td>0.018*</td>
</tr>
</tbody>
</table>

Note: * $p < 0.05$  ** $p < 0.01$  *** $p < 0.001$

TABLE 6 One-way ANOVA for anchoring and communication effects in Experiment 2

<table>
<thead>
<tr>
<th>Recycling Rate</th>
<th>Message with Anchor</th>
<th>Mean</th>
<th>SD</th>
<th>$F$</th>
<th>$p$ (Scheffe’s test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimation</td>
<td>None</td>
<td>48.46</td>
<td>13.02</td>
<td>33.614</td>
<td>0.000***</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>33.52</td>
<td>13.39</td>
<td>(High &gt; None &gt; Low)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>66.67</td>
<td>18.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognition</td>
<td>None</td>
<td>3.96</td>
<td>0.44</td>
<td>0.107</td>
<td>0.899</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>3.90</td>
<td>0.60</td>
<td>(High &gt; None)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.92</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>None</td>
<td>3.35</td>
<td>0.42</td>
<td>4.389</td>
<td>0.016*</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>3.67</td>
<td>0.57</td>
<td>(High &gt; None)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.74</td>
<td>0.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior Intention</td>
<td>None</td>
<td>3.67</td>
<td>0.53</td>
<td>0.140</td>
<td>0.870</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>3.76</td>
<td>0.62</td>
<td>(High &gt; None)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.76</td>
<td>0.86</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * $p < 0.05$  ** $p < 0.01$  *** $p < 0.001$

Compared with the no-anchor group, subjects moved their estimates toward lower recycling rates in the low-anchor group, at 33.52%, and higher recycling rates in the high-anchor group, at 66.67%. Those results verify the anchoring effect, confirming hypothesis H1. By comparing results in Tables 2, 3, and 6, the difference
of recycling rate estimates between groups with various anchors has the same order of magnitude in the within-subject and between-subject design experiments.

Similar to the results in Experiment 1, the communication effect is not as obvious as the anchoring effect. After multiple comparisons, the only significant distinction occurred for attitude (TABLE 6; \( F = 4.389, p = 0.016 \)) between the no-anchor and high-anchor groups. There is no difference for the communication effect among all three message groups, demonstrating that dominance of advertising contexts with no anchor, a low anchor, or a high anchor does not exist, and hypotheses H2 and H3 are not confirmed. The testing results of experiments 1 and 2 show high consistencies.

**CONCLUSIONS**

**Discussions**

There is no doubt in this study that an anchored message in an advertisement significantly influences the evaluations of target audiences as others’ works (Northcraft & Neale, 1987; Kristensen & Gärling, 2000; Jonas et al., 2002; Yang, Lin, & Yang, 2009). Our results also agree with research on recycling in showing that properly designed prompting and informational strategies promote recycling behavior (Hopper & Nielsen, 1991). Unfortunately, the consistent results of the two experiments do not sustain what we expected from the communication effects of anchored messages. Exploring the results of Experiment 1 more carefully, the communication effects regarding recycling in cognitions, attitudes, and behavior intentions do increase slightly (TABLE 2 and TABLE 3) because of the anchored messages given in GROUP A and GROUP B, although not significantly. However, the difference in behavior intentions between messages with no anchor or a high anchor in GROUP B is almost statistically significant (TABLE 3; \( t = -1.76, p = 0.086 \)). In Experiment 2, Scheffe’s test shows that attitude with a high anchor is higher than attitude without an anchor. These results partially verify the second
hypothesis, and the inconsistency between the estimates of audiences for anchors and communication effects could be explained by Schwartz’s (1970, 1977) social-psychological model. It is possible that people are inspired by urgent crises of resources as they recognize a low recycling rate or encouraged by the idea of a cleaner future life as they recognize a high recycling rate, becoming willing to do more recycling to protect the earth in both situations. Schwartz’s model showed that behaviors such as recycling belong to a social structural level approved strongly by everyone, yet individuals have their own internalized attitude on a personal level (Schwartz & Howard, 1980).

Managerial Implications

There exists a process of translation from personal attitude to real action. Whether people behave a certain way eventually depends upon the awareness of the consequences of recycling and the ascription of responsibility for those consequences. It seems that there is an unknown transfer mechanism from significant anchoring effect to effective communication by message manipulation with/without an anchor only once. This is a reality in many social marketing issues. According to test results in this study, we conclude that an anchoring effect caused by messages with an anchor does not necessarily induce better communication effects.

It has been demonstrated that anchored advertising messages help customers evaluating rational product values in commercial marketing while applying similar message manipulations in social marketing assist subjects understanding truth for specific issues and thus change their cognitions, attitudes, and behaviors in certain sense to strengthen communication effects. For example, the encouraging blood donation message including types and quantities of shorting blood will improve donators’ behaviors and get better blood allocation efficiency. Advertising message with higher anchor increases whereas lower anchor decreases estimations of product value in marketing, however, is not necessary getting similar results for some public beneficial behaviors in social marketing. This study shows that anchored message
have somewhat better communication effects but there is no significant difference between communication effects of message with high and low recycling rates.

A latest example of public beneficial behavior in social marketing is the donation encouragement to help victims after ferocious earthquake and tsunami in Japan, 2011. Two efficacious communication strategies can be applied to inspire charity. Charitable organizations such as Red Cross may declare that it has fulfilled 85% of the donation goal (a higher anchor) to expedite folks’ behaviors satisfying remaining benefaction. On the other hand, one can announce that financial contributions reach only 25% of the required relieving fund (a lower anchor) to stimulate people’s sympathy to increase their donations. Whether high or low anchored message is more effective to correspond with people still need to be tested, yet either way may have substantial communication effects better than message without any anchor.

Limitations

This study implements experimental method by homogenous samples to avoid variances caused by factors other than anchored messages. The advantage is better internal validity of measurements but disadvantage is worse external validity. Therefore, the conclusions of this study being applied to other social ideas should be very cautious. The mechanism of anchoring and communication effects by manipulating anchored messages is different for public and personal beneficial social marketing issues.

Future Research

There is other relevant research informing this study. Yang at al. (2009) studied safe driving, which is a more personal profitable behavior than recycling, demonstrating that an advertising message with a high anchor (e.g., the rate of high death for unsafe driving) will obtain a better communication effect than a message
with a low anchor (e.g., the low rate of death for safe driving). The insignificant difference of communication effects between messages with a high or a low anchor in this study exhibits a contrary but interesting result. Stimulated by identical advertising practices as Yang et al. (2009), an audience reveals different trends of communication effects between public and personal beneficial behaviors. Moreover, affective influences play a critical role in public beneficial behavior, such as recycling. Rather than any external stimulation, affect in recycling has greater inspiration on the attitude of individuals who have weak attitude strength than of individuals who have strong attitude strength (Smith, Haugetvedt, & Petty, 1994; Meneses, 2010). Manipulating the anchored message without considering the affective influences could be the cause of the lack of significance for the communication effects in this study. Finally, Tonglet, Phillips, and Read (2004) reported that opportunities, low costs, and convenience are also determinants for attitude and behavior about recycling, in addition to persuasive message manipulation. We may need to consider other factors influencing communication effects, rather than anchored messages alone.

There are plenty of unknowns remaining to further study the effectiveness of anchoring and communication effects in changing attitudes and ideas toward various social marketing issues, such as finding a general percept for the difference between public and personal beneficial behaviors by applying the current or modified research frames. The connection between anchoring and communication effects is important as well. How anchoring effect influences and transfers to the communication effect is an interesting problem. Establishing a new persuasive framework other than Schwartz’s (1970, 1977) model would be a useful contribution and a challenge. Crucial for everyone in a community seeking positive social change from a specific idea is not only to “know it” but also to “do it”. In many practical situations, we only care about actions and results instead of cognitions and attitudes. Therefore, it may be a good suggestion to name idea marketing, rather than social marketing, as influential in changes in behavior with regard to particular public issues.
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Biographical Sketch

Dong-Jenn Yang is an Associate Professor at the Department of Business Administration in I-Shou University of Taiwan. He received his Ph.D. from the Business Management Department of the National Sun Yat-Sen University. He is the author of Marketing Strategies for Nonprofit Organizations and the co-author and translator of five books, including Green Marketing, Service Marketing and Management, Marketing Principle and Business in Action. His articles have been published in the Journals TSSCI, SCI, EI, and ABI.

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錨點訊息操弄與溝通效果：以資源回收為實驗案例

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中文摘要

在社會行銷中，探索如何改變受眾對公共議題的認知、態度、與行爲藉以增進社會福祉是一項重要的研究，而適度操弄錨點位置以加強與受眾的溝通效果已被證明是商業行銷中的一種有效手段。本文則討論如何將此商業行銷上的有效方法應用於一項特定社會議題，即操弄錨點訊息以影響閱聽人對某個未知數量（資源回收率）的估計，並檢定此種作法是否真正可增進與閱聽人的溝通效果以調整對資源回收的態度與行為。兩種實驗結果均顯示包含錨點的訊息確實顯著影響閱聽人對資源回收率的錨點估計，高、低錨點訊息皆可激勵閱聽人支持資源回收，但效果只有少部分顯著，這與類似但屬於利己行為研究的結果不同。

關鍵詞：社會行銷、定錨效果、溝通效果、資源回收

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