



We care a lot: Formative research for a social marketing campaign to promote school-based recycling

Abby Prestin^a, Katy E. Pearce^{b,*}

^a Department of Communication, 4414 Social Sciences and Media Studies Building, University of California, Santa Barbara, CA, United States

^b Department of Communication, 4417 Social Sciences and Media Studies Building, University of California, Santa Barbara, CA, United States

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ABSTRACT

A city environmental services department aimed to increase recycling in city schools. This study serves as formative research to assist the ESD staff's efforts to encourage pro-recycling knowledge, attitudes, and behaviors to city junior high and high school students. Using a social marketing framework, a review of the literature on antecedents to recycling behavior with a particular focus on adolescents is presented. Based on seven focus groups (total participants $N=62$) conducted with adolescents attending city junior high and high school, this study presents formative research findings demonstrating adolescent knowledge, attitudes and behaviors toward recycling. Four recommendations are made: consistent and accessible recycling infrastructure must be in place, an improvement in adolescents' knowledge of what is and what is not recyclable is important, adult advocates should consider a two-step flow approach using adolescents to promote recycling to adults rather than enhancing adolescent concern for social acceptance, and finally, adolescents may be more globally minded and future-oriented than adults may presume them to be.

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Recycling is the procedure by which waste is collected and processed into raw materials that are then manufactured into new products (EPA, 2002). This process has a number of benefits for society and the environment, including the reduction of pollution and greenhouse gasses, the conservation of natural resources and energy, the stimulation of economic and technological development, and the preservation of funds earmarked for waste disposal. According to the United States Environmental Protection Agency (EPA), in 2008 the country generated more than 250 million tons of municipal solid waste; of this, 33%—or about 83 million tons—was recycled. Although the amount of materials recycled increased by 4% over levels recorded in 2000, waste production rose as well, indicating that people still need encouragement to recycle on a consistent basis.

The school system is a major waste-producing sector, contributing between 20 and 35% of the national total (EPA, 2007) and thus providing an excellent opportunity to divert waste into recycled materials. In order for this to occur, the challenge for administrators, officials, and school personnel is to provide not only infrastructure that supports recycling, but to increase recycling behavior as well. A number of studies have found that younger

people are knowledgeable, interested in, and worried about environmental problems (Arcury and Christianson, 1990; Nord et al., 1998) and that the best predictor of environmental concern for adolescents was environmental knowledge (Lyons and Breakwell, 1994); the challenge now is to build on this foundation to promote recycling behavior. To this end, this paper presents formative research findings demonstrating adolescent knowledge, attitudes and behaviors toward recycling.

1. School-based recycling

A medium-sized West Coast city aims to attain a waste-to-recycle diversion rate of 70% by the year 2010; a sub-goal is the improvement of the School District's recycling rate from 26% to 50% (ESD, 2005). The city's Environmental Services Department (ESD) is responsible for meeting this school-based goal. An evaluation of school waste type and amount by the ESD (2007) found that the largest amount of waste is produced in the cafeterias, where compostable foodscraps and recyclable food-related packaging such as cardboard trays, water bottles, energy drink cans, and chip or cookie bags are thrown away. The ESD and School District have made strides toward developing the appropriate infrastructure for school-based recycling: new recycling cans were installed next to trashcans in school cafeterias throughout the city in late 2008. These containers will be complemented by efforts, such as in-class presentations by ESD staff, and printed pamphlets, to encourage

* Corresponding author.

E-mail addresses: prestin@umail.ucsb.edu (A. Prestin), kpearce@umail.ucsb.edu (K.E. Pearce).

students to recycle at lunchtime. This paper will describe findings from focus groups conducted with students, which served as formative research to assist the ESD staff's efforts to encourage pro-recycling knowledge, attitudes, and behaviors to city junior high (ages 12–14) (called "middle school" in other districts) and high school (ages 14–18) students.

2. Theoretical framework: social marketing

The ESD's campaign will be guided by the principles of social marketing. Social marketing is "the adaptation of commercial marketing technologies to programs designed to influence the voluntary behavior of target audiences to improve their personal welfare and that of the society of which they are a part" (Andreasen, 1994, p. 110). Maibach et al. (2002) offer an overarching definition of social marketing as "a process that attempts to create voluntary exchange between a marketing organization and members of a target market based on mutual fulfillment of self-interest" (p. 440). These campaigns focus on influencing behavior and aim to benefit individuals, families, communities, or society as a whole rather than the organization that produces the campaign (Andreasen, 1994, 1995; Maibach, 2002).

Social marketing is based on the marketing principles of product, price, place, and promotion (Andreasen, 1994, 1995; Kotler and Zaltman, 1971). The product is the behavior that is appropriately packaged to meet the target audience's wants and needs (Kotler and Zaltman, 1971). Price is the cost (economic, social, and psychological) that the audience pays to obtain the product (Maibach, 1993). Place refers to the distribution and accessibility of the product, as well as response channels. Finally, promotion is the persuasive content that will make the product familiar, acceptable, and desirable to the audience (Kotler and Zaltman, 1971) as well as the mechanisms to alert the audience to the product (Flora et al., 1989).

There are a number of steps for conducting a campaign around these principles: uncovering barriers impeding behavior, designing materials to overcome barriers, piloting the materials, and evaluating the program (McKenzie-Mohr, 2000). The social marketing framework stresses the importance of formative research to develop an understanding of the target audience, and their perception of the behavior and its associated barriers and benefits. In essence, to change audience behavior, campaign designers first need to understand why people behave the way they do (Fishbein et al., 2001). The formative process can include researching the target audience, determining the campaign mission, objectives, and goals, establishing procedures and feedback mechanisms, and pretesting the program (Andreasen, 1995; Kurani and Turrentine, 2002). Qualitative and quantitative data techniques are used to develop an in-depth profile of what motivates targeted subgroups and market the product based on this information. This study focuses on the stage of formative research, with an eye toward prescribing a set of messages or message features that the ESD can use to promote recycling in schools.

3. Literature review

3.1. Antecedents to recycling behavior

3.1.1. Knowledge and beliefs

Knowledge and beliefs both relate to information one has about a topic, and thus they occupy much of the same conceptual landscape. Yet, they can be differentiated. According to Schacter and Scarry (2000), knowledge is "constantly subject to corrective modification and updating by experience," whereas beliefs are more resistant to correction (p. 177). Knowledge and beliefs are often linked in the literature. Studies have found that children acquire

a good deal of environmental knowledge by the time they reach junior high school (Iozzi, 1989; Kinsey and Wheatley, 1980) and thus it is common for them to hold well-defined beliefs about recycling and other environmental issues. For example, more than half of children as young as 6 years old have a basic understanding of the definition of recycling, as well as beliefs regarding its benefits for the environment (Palmer, 1995). However, though many children might have a cursory understanding of recycling, often they are unable to connect the benefits of recycling and consequences of not recycling to the environment in a sophisticated way. For instance, though they understood that recycling paper conserved trees and that littering had consequences for animals, children had difficulty identifying or explaining the repercussions of not recycling other materials, such as plastic bottles or aluminum cans (Bonnett and Williams, 1998). The use of educational campaign messages to enhance this relatively underdeveloped knowledge set may lend greater support to consistent recycling behavior.

Participation in recycling depends, in part, on one's set of beliefs regarding the benefits of recycling practices (McCarty and Shrum, 1994, 2001; Vining and Ebreo, 1990). Recycling is also predicted by beliefs related to personal or generational responsibility. For example, at the junior high school level, students conceived of recycling as their responsibility, thought that their generation cared more about the environment than did adults, and believed it was their role to make a difference (Bonnett and Williams, 1998). The main sources from which beliefs develop are teachers, parents, relatives, and media such as television or film (Bonnett and Williams, 1998; Gambio and Switzky, 1996).

3.1.2. Attitudes

Attitudes, which are comprised of sets of beliefs, are defined as "tendencies to evaluate an entity with some degree of favor or disfavor" (Eagly and Chaiken, 1993, p. 155). Behavior change theories, such as the theory of planned behavior (Ajzen, 1985, 1991; Ajzen and Madden, 1986), propose that attitudes are one of three factors that contribute to behavioral intention, which in turn predicts behavior. Along with subjective norms and perceived behavioral control, attitudes account for 71–91% of individuals' intention to complete the behavior (Kaiser and Gutscher, 2003; Kaiser et al., 2005). This is because attitudes toward the behavior are based on expectancy beliefs about the likelihood that behavior will result in particular consequences and on evaluations of the desirability of these consequences (Ajzen and Fishbein, 1980).

Generally, attitude toward recycling predicts behavioral intention for adults (Chan, 1998; Guagnano et al., 1995); research has also demonstrated a strong link between pro-recycling attitudes and recycling behavior for adults (Cheung et al., 1999; Gamba and Oskamp, 1994; McCarty and Shrum, 1994, 2001; Taylor and Todd, 1995a,b; Vining and Ebreo, 1990; Werner and Makela, 1998). Although there are no studies to date examining the relationship between adolescents' specific attitudes about recycling and recycling intention or behavior, studies have found associations between attitudes of environmental concern and conservation behavior. For junior high school students, ecological and moralistic attitudes toward the environment correlated with talking about the environment at home, watching nature films, and reading about the environment (Eagles and Demare, 1999). At the high school level, Meinhold and Malkus (2005) found that pro-environmental attitude predicted pro-environmental behavior in American students, and a study of Hong Kong high schoolers found that concern for the environment associated with interest in engaging in pro-environmental behaviors (Chan, 1998).

Finally, though studies are limited for this age group, there is evidence that intent to recycle mediated the impact of attitudes and norms on university student recycling behavior (Goldenhar and Connell, 1993). However, a number of studies have found that

young people recycle to a lesser degree than older people (Ball and Lawson, 1990; Biswas et al., 2000; Derkesen and Gartrell, 1993; Meneses and Palacio, 2005; Saphores et al., 2006; Scott, 1999).

We expect that to the extent that adolescents hold pro-recycling or environmental conservationist knowledge, beliefs, and attitudes, these factors will function as antecedents to their recycling behavior. Additionally, we seek to uncover additional antecedents to recycling not considered in the literature heretofore. Thus, we pose the following research question: RQ1—to what extent do adolescents hold pro-recycling or environmental conservationist knowledge, beliefs, and attitudes, and how do they, along with other antecedents, contribute to recycling behavior?

3.2. Barriers to recycling behavior

Researchers have found three primary barriers to environmental action: individuality (within a person's attitude and temperament), responsibility (locus of control), and practicality (social and institutional constraints) (Blake, 1999). Three additional factors have been identified as contributing to the behavior of those who do not consistently recycle: nuisance (i.e., inconvenience), location, and indifference (Howenstine, 1993). Distance in particular was a significant barrier to recycling that appears relatively consistent across studies (Amutenya et al., 2009; Clarke and Maantay, 2006; Humphrey et al., 1977; Luyben and Bailey, 1979; Perrin and Barton, 2001; Reid et al., 1976; Robinson and Read, 2005). Thus, we will ask the following research question in order to better understand the barriers that affect recycling for adolescents: RQ2—what are the barriers that affect recycling behavior for adolescents?

3.3. Subjective norms

Subjective norms (Ajzen and Albarracín, 2007; Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) are the perceptions of social pressure to engage in the behavior, which are based on perceived expectations of relevant reference groups concerning the behavior and motivation to comply with the reference groups. Therefore, both one's concern for how important others will react to his or her not recycling (Do Valle et al., 2004; Hopper and Nielsen, 1991; Pelton et al., 1993; Schultz, 1999; Tucker, 1999; Vining and Ebreo, 1990, 1992) and the presence or absence of social support for recycling are critical to this behavior (Hornik et al., 1995). This is particularly true when recycling is a public behavior, such as in the schools (Barr et al., 2003; Tucker, 1999).

Subjective norms may be especially important for adolescents, whose behavior is often influenced by peers. In fact, the primary needs of one subgroup of adolescents, "tweens" (adolescents between the ages of 10–13), are acceptance and success (Acuff, 1997), and popularity is another important drive (Comstock and Scharrer, 2007). For instance, 80% of tween boys reported desiring inclusion in a group (McNeal, 1992). Comstock and Scharrer (2007) argue that for 11–12-year olds in particular, conformity with peers is a priority. Austin (1995) further argues that elite peers are particularly influential, which was confirmed in a nutrition campaign in which middle schoolers were most responsive to peer leaders (Lytle et al., 2004).

These findings translate into campaign messages. For instance, Pechmann et al. (2003) found that effective anti-smoking messages associated smoking with social disapproval risks. Tweens are more subject to peer pressure than any other adolescent group: to illustrate, 54% of children ages 12–13 felt pressure to buy something because their friends owned it already, compared to 30% of 14–15-year olds, and 17% of 16–18-year olds (Lindstrom and Seybold, 2004). Interestingly, some evidence shows that recycling may not be an established social norm with this age group yet; children may

be cautious about appearing too pro-environmental, which may affect recycling behavior (Bonnett and Williams, 1998). Similarly, perceptions of a conservation behavior as socially unacceptable can be a major barrier to the performance of the behavior by young people (Monroe, 2003). Thus, we will ask the following research question to better understand the subjective norms surrounding recycling for adolescents: RQ3—what are the subjective norms (e.g., global, community, peers, adults) that surround recycling behavior for adolescents?

3.4. Effective advertising

There are a number of major findings in the marketing literature relating to persuasiveness of advertizing for adolescents. For example, adolescents like bright colors, good music, action, style, and humor—these elements may contribute to more interesting content with greater effects on their beliefs about a product (Aitken et al., 1988; Schooler et al., 1996; Slater and Rouner, 1996). Further, Lindstrom and Seybold (2004) argue that because tweens' lives tend to be routine, a successful marketing campaign should seek to break this routine. For this reason, quick pacing, slapstick, and abstract humor, as well as realistic and heroic role models can be successful tools in marketing to preadolescents (Acuff, 1997). McNeal (1992) lists six characteristics or emphases of brands that tweens prefer: fear, humor, mastery, fantasy, love, and stability. Fear was particularly important to boys, whereas love was more important to girls. Additionally, three tactics that drive successful tween marketing concepts include collection value (like Pokemon cards), gaming ability (a tie-in with a board or video game), and a mirror effect (opportunity for imitation).

Advertisers most often approach adolescents with the appeals of having the best products, having fun, seizing opportunities, being modern and cool, belonging to a group, being free, having energy, and acknowledging sexuality. One study found that adolescents preferred campaigns that informed or engaged them, rather than those that "preached" to them (Messerlian and Derevensky, 2006). Additionally, campaigns that did not present a balanced perspective, but were exaggerating or over-dramatic were considered ineffective. This literature provides a solid foundation on which to build campaign messages. However, given our goal to understand this specific target audience with as much depth as possible, we posed the following research question in order to hone in on their perceptions of persuasive and unpersuasive messages that are currently populating their media landscape. Thus, in RQ4 we ask: what are the important elements of effective media-based or interpersonal pro-recycling messages for adolescents?

4. Focus group methodology

The critical role of formative research in the development of effective social marketing campaigns necessitates the collection of data that will provide a deep and nuanced view of the target audience's current knowledge, attitudes, and norms regarding the behavior advocated by the campaign. Given this goal, we conducted a series of in-depth focus group sessions with junior high and high school students in the city to empirically investigate the beliefs, attitudes, subjective norms, and behaviors related to recycling and other environmental issues.

A focus group is a "carefully planned discussion designed to obtain perceptions on a defined area of interest in a permission, non-threatening environment" (Krueger, 1994, p. 6). The aim of a focus group is to produce qualitative data that provides insight into attitudes, perceptions, motivations, concerns, and opinions of participants (Kingry et al., 1990; Krueger, 1994). As a methodology for formative research, focus groups offer notable advantages

over other means of data collection. First, they can provide a multidimensional view of participants' knowledge, attitudes, and self-reported behavior. Focus groups maximize the variety of ways in which adolescents and teens can express themselves, using their own terminology and framework of understanding. Additionally, survey or laboratory methods often do not capture common forms of communication, such as stories, jokes, or loose word associations that can deliver great insight into a target audience's understanding of a topic (Bonnert and Williams, 1998). Second, focus groups encourage a greater degree of participant reflection upon personally relevant knowledge, attitudes, and behavior, rather than contrived laboratory experiences or survey scenarios imposed by the researcher. This means that focus groups have the potential to reveal "dimensions of understanding that often remain untapped by the more conventional one-to-one interview or questionnaire" (Kitzinger, 1994, p. 109). Third, the less formal structure of discussions may be considerably more stimulating than laboratory or survey designs for the age groups in this study. Given that our goal was to learn as much as possible from this sample, focus groups appeared to be an appropriate methodology toward obtaining a rich understanding of the topic under consideration.

The social marketing framework stresses the importance of formative research to develop an understanding of the target audience, and their perception of the behavior, and its associated barriers and benefits. In essence, to change audience behavior, campaign designers need to understand why people behave the way they do (Fishbein et al., 2001).

Focus groups are one methodology used in formative research to approach this understanding of the target audience. To be sure, this method has its weaknesses, chief among them being that the observations drawn from participants are not independent from one another, nor do participants represent a probability sample from a given population. Thus, the data from these focus groups is not generalizable to a larger population of adolescents. The strength of focus groups, particularly for this study, is that the qualitative data that emerges will help us to develop a better understanding of our audience, which we hope, in turn, will inform more effective campaign message design.

5. Method

5.1. Participants

In order to garner a relatively diverse yet balanced group of subjects, research coordinators suggested that teachers offer participation opportunities to both students with a special interest in environmental issues, as well as those without. When researchers believed a group not to be balanced in this manner, a second focus group was conducted at that site. This occurred at two separate locations (one junior high and one high school).

As a result, a total of 62 students participated in this study, with each one participating in one of seven different focus group sessions that ranged from 7 to 12 participants ($M = 10$). In focus groups, particularly those in formative studies, the number of cases in focus group research is typically small, as too large of a group may inhibit participation (Roose and John, 2003); thus, the sample size was appropriately limited here. Further, scholars note that the participants' age should dictate the size of the focus group. For older children (10 years and up), a group of 8 is optimal (Horner, 2000), and for adults, some scholars recommend between 4 and 8 participants (Kitzinger, 1995), whereas others recommend between 6 and 12 participants (Morgan, 1993). However, as recruitment is the single most common source of failure in focus group research (Morgan, 1995), we opted to include more participants than recommended.

Three focus groups were conducted in junior high schools and four were conducted at high schools. We opted to keep participants separated by age, as more than a 2-year age difference is discouraged in focus groups due to developmental differences (Kennedy et al., 2001). Regarding the demographic characteristics of the sample, 25 participants (40%) were male and 37 (60%) were female. Participants ranged in age from 11 to 18 years. Twenty-nine participants (47%) were in junior high school, and 33 participants (53%) were in high school. Ethnic composition is not available because it was deemed too sensitive of information to request for this study.

5.2. Procedure

Project approval was necessary at every stage of implementation. Before researchers could enter the school system, the study was first screened and approved by the city school district's director of research. Next, research coordinators contacted school principals and vice principals to obtain permission to proceed at each individual school. Each of the four junior high schools and three high schools consented to the project; however, because of overlap with state testing at two of the junior high schools, focus groups were only conducted at two of the junior highs. As the next step, research coordinators contacted teachers at each school to request student participants. A list of teachers was generated from the ESD's contact information, as well as recommendations from principals and other school administrative staff. Teachers told students that the subject matter of the discussions would be recycling and other environmental issues, and students could choose to participate or not. Finally, following teacher consent and participant recruitment, permission slips were sent to the parents or guardians of each student who had expressed an interest in participation to obtain guardian consent, in accordance with university human subjects procedures.

Six undergraduate research assistants and one research coordinator conducted the focus group sessions used in this study. All research assistants were provided with written guidelines for conducting focus groups and trained by a researcher from the same institution with experience in conducting focus groups with junior and senior high school students. Through this process, any ambiguous information on the procedure was clarified.

Two researchers attended each group, with one leading the discussion while the other contributed additional questions or comments. Five focus groups were conducted in a dedicated classroom facility, and two were took place in a quiet courtyard adjacent to a classroom. Students received lunch as compensation, and many were released from classes that met during the focus group session. Sessions ranged from 35 to 50 min in duration. All sessions were audio recorded, and one researcher also took notes during the discussion. All focus group sessions were fully transcribed verbatim from the audio files, and the transcripts served as the basis for subsequent analyses.

Group leaders encouraged all respondents to share their thoughts, and explained that they were interested in the students' own thoughts and opinions, and that there were no wrong answers. To maintain consistency across research sites, a standard list of discussion questions was generated before focus groups began, and researchers adhered to this list. However, to allow for the capture of unprompted insight, researchers allowed deviance from discussion of the main questions during the group sessions. Some key topic areas covered in the discussion were: recycling habits at school and at home, overall concern about the recycling and the environment, recycling infrastructure at their schools (e.g., placement of recycling containers around campus, consistency of recycling bins in classrooms), barriers to recycling, benefits of recycling, peer influence and opinions about recycling, media use, and effective/ineffective advertisements.

5.3. Data analysis

Data was analyzed with thematic analysis. Transcripts from the seven focus groups were analyzed using thematic analysis and a constant comparison method (Kvale, 1996). Thematic analysis is a search for themes that emerge as important to a description or understanding of a topic or phenomenon (Daly et al., 1997). The process involves the identification of themes through reading the data in multiple iterations (Rice and Ezzy, 1999). In this way, coders can develop pattern recognition within the data, where emerging themes then serve as analysis categories.

The process for this analysis began with the research coordinators and research assistants creating a master coding document of initial themes and keywords apparent in the focus group discussion transcripts; this document was revised as coding progressed. Next; the two coordinating researchers analyzed the transcript data together; during which time they discussed consistencies and discrepancies in code assignment to further develop a shared understanding of themes within the text. Through this process; all transcripts were coded with parent codes. Following this step; each researcher coded the transcripts separately for child codes; and then the researchers compared coding and to assure consistency of analysis. Throughout this process; researchers made conceptual notes of other important issues not represented by themes; and identified particularly salient or unique quotations from participants. A final meeting to review coding allowed for differences in interpretation to be discussed and resolved. Finally; similar themes were combined; and those unrelated to this study were eliminated from analysis.

6. Results

6.1. *RQ1—to what extent do adolescents hold pro-recycling or environmental conservationalist knowledge, beliefs, and attitudes, and how do they, along with other antecedents, contribute to recycling behavior?*

6.1.1. Knowledge and beliefs

Both junior high school and high school aged participants stated that they learned the most about recycling through classes at school, but many wished for more opportunities to learn about these issues in the classroom. Additionally, the majority of students expressed a desire to learn more about items that are recyclable in their schools versus those that are not. This lack of knowledge emerged as a major barrier to recycling, and as a consequence, is discussed further in the results for RQ2.

Students held strong beliefs toward conservation and recycling. A common theme amongst participants was that every individual can make a small difference by personally recycling. For example, a female high school student stated, “If millions of people make a small change it can be a small difference that together is really big. Show them they can be a part of bigger change.” More specific beliefs about the destiny of recyclable goods were also noted. For example, a male junior high school student stated that, “If we recycle we won’t be losing the unrenewable [sic] resources. Like rubber—we’re doing things where they recycle that and then sort it with cardboard and then they melt it and put it back together to make something new.” Landfills were an especially salient image for the participants, and many worried that beautiful natural resources, such as oceans, were becoming repositories for trash. For example, a female junior high school student believed that, “eventually landfills are going to cover the earth” and thought recycling was a way to stall this process.

6.1.2. Attitudes

Junior high school and high school aged participants repeatedly expressed a positive attitude toward recycling, coupled with a sense of apprehension about the effect of non-biodegradable objects on the environment and the use of non-renewable resources. Overall, participants expressed a great sense of concern for the long-term state of the earth. A male high school student said, “Well it’s the whole legacy thing . . . we want to preserve the earth for our kids. It’s like a gift to our children when we leave and we don’t want the earth to be boiling hot and full of pollution.” Another female high school student said, “It was pretty scary to see how what we’re doing is harmful for us and for the next generations after us. We have to do what we can against that. Recycling is a big part of what we can do.” A junior high school male stated, “It is our generation that is going to have to clean up stuff, so we need to do stuff so that there will still be an environment for future generations.”

6.1.3. Incentives

Incentives are a class of benefits that can be used to promote voluntary behavior change (Maibach, 1993). Junior high students often mentioned external incentives that schools or communities could offer them to encourage their recycling. Students appreciated the school-based incentives (e.g., extra credit) that some teachers offered, and suggested that small items such as free cell phone minutes or MP3 downloads would also motivate behavior. Other students suggested intra-class, intra-grade, or intra-school competitions to recycle the most items or to achieve the highest ration or recyclables to trash at the end of a certain period of time. As one high school female offered: “In a city in Northern California, the government went around and emptied everyone’s recycling and trash bins. If the trash was all trash and the recycling was all recycling, the class earned money. It would be really effective here if we made this a class competition where each class is against each other to recycle the most.”

Another type of incentive that participants often associate with recycling was internal incentives, such as positive affect, a sense of power and control, and the reward of feeling like a “good person.” For example, one salient theme of these focus groups was the connection between the individual’s actions and the consequences of these actions on the global environment. Far from feeling powerless to affect change in the global environment, a majority of the students believed that their actions could have a positive impact on the global environment, and this made them feel good about themselves. As one junior high female said, “It’s cool that you can make a choice to help the earth. If you can recycle just one thing, and everyone recycles one thing, then that would keep from filling up landfills. If you recycle everything, it can make a big difference.” Additionally, students often associated positive affect and feelings of pride or accomplishment with this personal positive impact of recycling. As one junior high male said, quite simply, “It just feels good to recycle, knowing that you’re helping the earth.”

6.2. *RQ2—what are the barriers that affect recycling behavior for adolescents?*

6.2.1. Knowledge

Not knowing what is and what is not recyclable was a commonly mentioned barrier to recycling and students suggested that ameliorating confusion over what is and what is not recyclable would motivate more recycling behavior. As one high school female said, “We need to inform more people about what is recyclable versus what’s not, because people definitely don’t know. People know about recycling cans and bottles, but we need to let them know they can do more than that.” Students suggested signs, posters, or ver-

bal reminders, and felt that in general, it would be helpful if more product packaging included “recyclable” logos.

6.2.2. Infrastructure

Focus group participants believed that a strong infrastructure supporting recycling would facilitate this behavior in not only schools, but at home and in their communities as well. Many of the schools had received new trash and recycling bins installed next to each other not long before these focus groups were conducted, and students noted that these bins had a positive impact on the amount they recycled. One high school male said, “There are about 10 of them on campus and it’s easier now, you just can walk 10 feet to go and recycle.” Many students expressed this same belief, that a greater number of recycling bins made recycling easier and more convenient, which in turn increased recycling behavior. One high school male explained, “Most people are lazy, so their recyclable can is going to get thrown in the nearest place. If there is a trash can nearby, that’s where it is going to go, if there is a recycling bin nearby, that’s where it is going to go.” These findings build on those of other studies, which demonstrate that distance is a major barrier to recycling (Amutenya et al., 2009; Clarke and Maantay, 2006; Humphrey et al., 1977; Luyben and Bailey, 1979; Perrin and Barton, 2001; Reid et al., 1976; Robinson and Read, 2005).

Students expressed a desire to have every classroom outfitted with at least one recycling bin, with many stating that if recycling bins were consistently placed throughout all their classrooms, it would encourage consistent recycling behavior. Beyond adding to the number of recycling containers, students also suggested that increasing the size of recycling containers relative to trash cans would encourage recycling, as would emptying the recycling containers more frequently so they would never be too full to accommodate more items.

6.3. RQ3—what are the subjective norms (e.g., global, community, peers, adults) that surround recycling behavior for adolescents?

6.3.1. Global norms

There was much discussion among high school participants about the amount of recycling by Americans compared to those in other countries. The participants seemed to be divided on this issue, with some believing that Americans recycle much more than people in other countries, and others believing they recycle much less. For example, a high school male participant stated that “There seems to also be a culture divide because I know a lot of my friends who are first generation Americans and they do not recycle at all because their parents are from Mexico and they do not recycle very much there.” In contrast, a high school female stated, “A lot of other countries are doing a great effort to recycle and conserve. The US is lacking in that.” Similarly, a high school male described an extensive, effective recycling program in Norway.

6.3.2. Community norms

High school participants were concerned about what the greater community (city, county) was doing about recycling. There was a sense among many participants that their community was more environmentally concerned than other communities were, as evidenced by statements like “[This county] is really environmentally friendly” and “most people seem to care” as well as “a lot of places are not as environmental as we are.”

6.3.3. Peer norms

Some of the high school students who participated in these focus groups did not believe that their peers were very concerned about recycling because they are “lazy” and “don’t care” enough to recycle. Junior high participants said their peers who did not recycle were acting “selfishly.” These participants often mentioned that

the overall health of the earth and the environment were in their generation’s hands, and thus believed that educating their peers about the benefits of recycling and trying to make them care about environmental issues was very important. According to these participants, recycling was not deemed either as “cool” or “uncool,” and there was no stigma attached to recycling—as one high school female said, “recycling doesn’t make you a hippie or anything.”

6.3.4. Adults/authority figure norms

Students believed that some of their teachers were apathetic toward recycling and the environment, while other teachers cared a lot about these issues. These attitudes had implications for students’ recycling behavior. For example, where some teachers equipped their classrooms with recycling bins, while others only had trash cans, which presented a barrier to recycling for students. Other teachers monitor the items students threw into the trash, and reprimanded them if they threw away recyclables. In one case, students even reported they had received detention for throwing away recyclables. Students also believed that though adults had more power and control to make choices that could positively affect the environment, often adults were not informed on these issues. Junior high school aged participants often mentioned that adults need to be more environmentally conscious. One junior high male said, “It’s a lot harder for kids to stop global warming because we don’t have as much control or power. The adults are the ones that decide what they buy and what they don’t, but a lot of times the adults aren’t informed.” Others said they did not think their parents or other adult authority figures cared about environmental issues, and this apathy affected whether or not the adult recycled. Students expressed a desire for adults to recycle more, and also believed that since their own generation would likely face the effects of the damage on the environment, it was up to them to set a good example for their parents and the other authority figures that were unconcerned about the environment. Examples of behaviors that followed from this sense of generational responsibility were that some students acted as “enforcers” of recycling in their homes, while others taught their parents about recycling.

6.4. RQ4—what are the important elements of effective media-based or interpersonal pro-recycling messages for adolescents?

6.4.1. Media messages

Effective media messages related to environmental issues discussed by the high school participants included magnets that explained what items are recyclable, making the messages personally relevant, and emphasizing the impact on the global environment. A number of participants mentioned the impact that the documentary film *An Inconvenient Truth* had on their beliefs, attitudes, and behaviors related to the environment. Others mentioned documentary-style television shows as examples of programming that increased knowledge about environmental issues.

In terms of specific elements of effective media messages, junior high school students often mentioned animals in advertisements as an effective means of getting their attention. This group of participants also noted that using statistics about environmental impact is very effective for them. In considering what an effective pro-recycling media message might look like, one student combined these two elements, suggesting, “If they told me that by recycling a certain amount I could save 10 polar bears, I’d be more motivated to do it because I’d know exactly what effects it would have. Usually you can recycle a ton and have no idea what effect it has or think you’re not doing anything but this would show you’re actually helping.” Junior high school aged participants also wanted humorous messages, which is consistent with the literature on marketing to

adolescents. They also believe that messages featuring actors close to their own ages would be more persuasive than older celebrities. Participants also expressed concern over the credibility of celebrities. As one junior high female said, “I seen commercials all the time where celebrities are saying, ‘I recycle, it’s so great!’ and it seems so fake, like they were just told to say it or paid to say it and they don’t actually mean it.” It was important to participants that messages promoting recycling feature advocates who are sincere in their appearance and whose own behavior is consistent with that which they advocate.

Effective media messages for high school edged toward a more advanced degree of sophistication, with most participants supporting the literature’s findings that humor appeals and sex appeals are effective for this audience. Other key elements included the use of music and tailoring the message to the audience. A high school female participant explained: “You have to approach them with something they care about and connect recycling to that.” And another high school female participant stated, “Targeting each person with what their interests are.” Yet, however effective a media message might be at the outset, this audience grew bored of messages when faced with their repetition, which greatly diminishes the message’s effectiveness.

6.4.2. Interpersonal messages

Effective interpersonal messages for high school aged participants included emphasizing self-efficacy, resource management, and the connection of an individual’s recycling behavior to the implications it has for the environment as a whole. One female high school participant explained: “You can’t really force people to do something. You can’t walk them to the recycling bins. You can tell them as much as they want, but it is in their actions if they actually do it.” In considering potential motivators to encourage other students to recycle, many students believed that highlighting the personal connection that each individual’s actions have to the global environment could show people it matters if they recycle. “People like to feel they’re important and that what they do makes a difference,” one high school female said. “To convince them to recycle, we can target what they like and care about the most and show the effects of not recycling on those things. We can show how their actions can help or hurt those things.”

7. Discussion

This study was intended to provide insight into the antecedents to recycling behavior in an effort to lay the formative research groundwork that will assist the Environmental Services Department of a medium-sized west coast city in developing a campaign to increase recycling in junior high and high schools. Following the structure provided by the social marketing framework, we sought to develop an understanding of this target audience’s knowledge, attitudes, and behavior related to recycling with the goal of designing appropriate, effective pro-recycling messages to be disseminated in junior high and high schools. Our findings are discussed below.

Overall, participants seemed knowledgeable about environmental conversation and recycling. However, as will be discussed, the lack of knowledge about what is and what is not recyclable is a major barrier to recycling behavior. Interestingly, though knowledge was low, pro-recycling attitudes were strong. Traditionally, knowledge, attitudes, and behavior are viewed as 3-step sequential model, but in the case of pro-recycling behaviors among the junior and senior high school students in this study, we found that strong pro-recycling attitudes are already in place despite comparatively weak knowledge about recycling. Contrary to stereotypes that adolescents tend to be apathetic or self-absorbed, these participants

were globally minded and future-oriented, expressing concern for the longevity and well-being of the environment. They believed that their generation had responsibility to care for the earth now so the planet would be healthy when their generation inherited it. Some participants even believed that their generation cared more about recycling and felt more positively toward this behavior than did their parents, teachers and other authority figures; as a consequence, they became advocates of recycling at home and school, in part, to compensate for these adults.

Therefore, while many pro-recycling campaigns focus on attitudinal change, we found that participants believed recycling was a good behavior with positive results. Rather than try to “sell” recycling to these participants, a campaign should build upon their positive attitude toward this behavior by providing the infrastructure to support the behavior and the knowledge of what is and what is not recyclable. Additionally, giving adolescents tools to help them communicate their beliefs to adults would likely be an effective strategy to expand recycling beyond the schools.

Overall, participants were aware of the benefits of recycling and the consequences of not recycling, but they had comparatively less knowledge about what is and is not recyclable. This knowledge deficit represented a considerable barrier to their recycling behavior, and understanding what is and is not recyclable was a major concern of these participants. These findings echo those from a sample of university students who expressed frustration with the lack of information about recycling and poor signage on containers, and reinforces the idea recycling-related knowledge can be complex (Hansen et al., 2008). For example, though most participants could correctly identify items such as aluminum cans and office paper as recyclable, they faced difficulty in determining whether other common items such as coffee cups or cardboard cafeteria trays were recyclable. This is an important finding, as knowledge of what materials are recyclable is positively linked to recycling behavior (Schultz et al., 1995).

Therefore, in undertaking efforts to promote recycling behavior, campaign designers should not assume that their target audience knows what is and what is not recyclable: conveying this knowledge appears to be an important first step for any pro-recycling campaign targeted toward adolescents and young adults. This is particularly true concerning less common recyclable items. Interestingly, two television advertisements in Portugal promoting recycling to adult populations featured a monkey and a small child knowing what is recyclable (Do Valle et al., 2005). Although our data do not speak to the knowledge of adults concerning what is and what is not recyclable, they do suggest that this knowledge might be something campaign designers could potentially take for granted.

Student responses about infrastructure were unsurprising, as numerous studies (Derkesen and Gartrell, 1993; Grodzinska-Jurczak et al., 2006; Martin et al., 2006; Mee et al., 2004; Read, 1999; Salhofer and Issac, 2002) have found that without proper infrastructure, recycling behavior cannot occur. Specifically, convenient recycling infrastructure is especially important (e.g., Do Valle et al., 2005; Kelly et al., 2006; Meinhold and Malkus, 2005; Perrin and Barton, 2001, and numerous earlier studies). As Kollmuss and Agyeman (2002) argue, many pro-environmental behaviors can only take place if the necessary infrastructure is provided; if the services are poor, people are less likely to use them. Our participants reflected these beliefs, stating the importance of recycling infrastructure such as containers in classrooms and cafeterias. Moreover, it is not enough for recycling infrastructure to be present at some times in some places—it must be *consistently* available. The placement of recycling bins in some classrooms but not others, for example, resulted in inconsistent recycling. Supportive infrastructure must be in place for recycling to become a habit.

Not surprisingly, participants mentioned external incentives as motivators to recycle. These findings corroborate those of earlier studies, which found that incentives are an effective means of behavioral promotion for adolescents in many social marketing campaigns (Lytle et al., 2004; Parcell et al., 2007). Although to date there are no published evaluations of campaigns utilizing incentives to increase recycling for adolescents, for adult populations, incentives have been found to increase recycling (Bolaane, 2006; Hornik et al., 1995; Jacobs and Bailey, 1982; Vining and Ebreo, 1990).

However, external incentives may not create long-term enduring changes in behavior (De Young, 1986; Geller et al., 1982; Jacobs and Bailey, 1982; Ortis et al., 2007). Thus, the major caveat to including an external incentives-based component in a campaign is they may be such strong motivators that once they are removed, behavior returns to baseline levels (Curlee, 1986; Iyer and Kashyap, 2007; Pardini and Katzev, 1984; Reid et al., 1976). As such, internal incentives (i.e., intrinsic motivation; Ryan and Deci, 2000), such as positive affect resulting from doing good for the community and environment significantly influence recycling behavior (De Young, 1986), as does the internal incentive of feeling like a responsible person (Berglund, 2006). Furthermore, school-based research has found that intrinsic goals led to greater engagement in an activity and more persistent behavioral change relative to extrinsic goals (Vansteenkiste et al., 2004, 2006). Additionally, and perhaps unexpectedly, emphasizing both intrinsic and extrinsic goals resulted in lower levels of outcomes compared with intrinsic goal framing alone (Vansteenkiste et al., 2004, 2006), a finding that led Pelletier and Sharp (2008) to argue that stressing intrinsic goals of recycling may lead to greater pro-recycling behavior. As many participants stressed, the positive affect, feeling of control, and believing that their actions mattered in the world were rewarding in and of themselves.

8. The application of social marketing principles to school-based recycling

In the implementation of a social marketing campaign, the four P's (i.e., product, price, place, promotion) serve as guiding principles, and as such, we consider our results against these four factors. The product is the behavior that is appropriately packaged to meet the target audience's wants and needs (Kotler and Zaltman, 1971). As discussed earlier, the behavioral "product" for this study is the consistent recycling behavior of adolescents in junior high and high schools.

The price of recycling behavior, or the cost that the target audience pays to obtain the product (Maibach, 1993), appears to be the inconvenience of the behavior, especially when trash bins are available and recycling bins are not. The participants indicated that the major deterrent to recycling, particularly in schools, was a lack of adequate infrastructure. This point relates not only to price, but to place as well. Place refers primarily to the distribution and accessibility of the product. This is infrastructure, and good placement can reduce the cost of this behavior. According to the literature, infrastructure improvement, or the enhancement of place as a fixed environment, is one of four key strategies for place improvement within a marketing campaign, along with design, basic services, and attraction (Kotler et al., 1999).

Finally, promotion is the both campaign content that will position the product as desirable to the given audience (Kotler and Zaltman, 1971), and the means of advertising the product (Flora et al., 1989). Some social marketing campaigns targeted toward adolescents are built on the promotion of a behavior as fun and cool. For instance, the recent VERB campaign effectively promoted physical activity to tweens by positioning exercise as "cool" and associ-

ating it with popular young entertainment stars and fun images (Huhman et al., 2004). Indeed, findings from focus group studies with adults reveal that adults may believe that adolescents need positive behaviors promoted to them and focus on social norms and making the behaviors "cool" (e.g. Uetrecht et al., 1999). Yet, we found that participants viewed recycling as an important and beneficial behavior that was supported by peer norms. A campaign that focused on promoting recycling as "cool" would likely enhance a positive attitude that already exists. Rather than bolster this positive attitude, social marketing campaign planners might instead consider improving audiences' knowledge of what is recyclable, thus enhancing their self-efficacy to recycling and potentially affecting greater behavioral performance.

9. Conclusion

The goal of this paper was to explore antecedents to recycling behavior (e.g., knowledge, attitudes, subjective norms) for a target audience of adolescents, and provide a foundation on which a pro-recycling social marketing campaign can be built. As such, we offer four concluding recommendations.

- First, infrastructure of recycling bin placement needs to be consistent and accessible to encourage consistent recycling behavior. For instance, a more even, consistent distribution of recycling bins in every classroom is likely to increase students' recycling behavior:
- Second, improving adolescents' knowledge of what is recyclable is of potentially considerable importance to campaign designers. As demonstrated by our focus group findings, even junior and senior high school students with strong positive pro-environmental attitudes are uncertain about what is and is not recyclable. An effective campaign could begin with messages that increase this knowledge.
- Third, while to some adult marketers, enhancing adolescent concern for social acceptance may seem like an appropriate strategy for encouraging pro-environmental behaviors, recycling may already be the norm among this generation. If this is the case, instead of encouraging junior and senior high school students to recycle, campaigns can adopt a two-step flow in which messages encourage this audience to advocate recycling to the adults (parents, teachers, administrators) in their lives.
- Fourth, adolescents may be more globally minded and future-oriented than many adults may presume them to be. Campaigns can capitalize on this perspective by developing persuasive messages that connect the individual's recycling behavior to the effects of recycling on the environment as a whole. An effective message could stress inter-connectedness between the individual and his or her surroundings, tap into the sense of responsibility and protectiveness that this age group feels toward the planet, and emphasize the impact of each individual's behavior.

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