Effectiveness of Prompts and Models on Food Composting by Restaurant Patrons

by

Reuven Sussman
B.Sc., University of Toronto, 2003

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Abstract

Composting of biodegradable waste is an effective means of reducing landfill garbage and improving the state of our environment. The widespread adoption of this behaviour by community members is subject to various social psychological processes. Table top signs outlining a pro-composting injunctive norm, and models demonstrating the behaviour (descriptive norm) were employed in two shopping centre food courts and a fast food restaurant to attempt to increase the use of public compost bins. When diners viewed models composting ahead of them, they were more likely to compost as well. However, the signs had no effect on composting rates, either alone or in combination with the models. Results support the idea that behaving in a pro-environmental manner around others can have an influence on them to behave pro-environmentally as well.

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CHAPTER 1
Introduction

Waste Management Issues

The impact of individuals on the planet's resources, ecosystems and climate is ever-increasing, and the waste produced is a large part of the problem. Given that most of the world's municipal waste ends up in landfills (Boyd, 2001; e.g., Clean Air Council, 2006; European Commission, 2005; United Nations Statistics Division, 2007b), much valuable habitat and arable land are occupied by waste, and damaging greenhouse gasses like methane and carbon dioxide are produced as a by-product of waste decomposition (Doorn & Barlaz, 1995). The problem is compounding as the amount of municipal waste increases (United Nations Statistics Division, 2007a). Despite an available infrastructure for composting and recycling, most waste could still be diverted more efficiently.

Canada's track record for waste generation and waste diversion is somewhat poor (Boyd, 2001). Despite a slight reduction in per-capita waste between 1980 and 1997 (3.9%), the total amount of municipal waste produced in that time increased 17%, and in 1997 Canada sent over 90% of all municipal waste to landfills (Boyd, 2001). Overall, Canada ranked 18th best out of 29 Organization for Economic Cooperation and Development (OECD) countries in municipal per-capita waste generation (Boyd, 2001). In the following two years (1998 to 2000) per-capita non-hazardous waste (one third municipal) increased by an additional 10% (Environment Canada, 2003). A significant proportion of this waste is organic but decomposes very slowly and inefficiently in landfills. Landfills are designed to prevent this process in order to avoid the leeching of toxic chemicals into the soil. One municipal district on Canada's west coast estimates that over 30% of the waste entering its landfills is organic (Capital Regional District, 2008).

Composting. Many pro-environmental waste-management behaviours may currently be practiced by individuals as part of their daily routines (e.g., reusing or recycling goods). Composting is an additional way that individuals can make an effective contribution to waste diversion. By reducing the amount of organic waste that ends up in landfills, individuals reduce the amount of methane produced, allow organic materials to be re-absorbed into the natural ecosystem, and create a nutrient-rich soil supplement which reduces the need for petroleum-based fertilizers (Favoino & Hogg, 2008). Hence, composting helps to mitigate climate change, reduce the pressure on existing landfills (and the need to open new ones), and limit the use of petroleum. Several urban centres, such as Toronto, have successfully implemented public composting pickup to improve landfill waste diversion (City of Toronto, 2006). However, composting will only work if individuals adopt the behaviour and the method of adoption may be subject to various social psychological processes.

Like many pro-environmental behaviours, the impact of composting at an individual level may be small, but can be very large if performed by a large number of people. There are many barriers preventing individuals from engaging in the behaviour. One of which is that few others are performing it. If people believe that many others are engaging in the behaviour (because they see them doing so), then they too are likely to perform it. This occurs not only because their actions appear more efficacious, but also because seeing others engage in the behaviour may result in social pressure to conform. This social pressure is addressed by several social norm theories including the focus theory of normative conduct (Cialdini, Kallgren, & Reno, 1991).

The Focus Theory of Normative Conduct

Focus theory (Cialdini et al., 1991) postulates that two types of social norms exert influence on individuals in any given situation: injunctive and descriptive. An injunctive norm is an understanding of what *ought* to be done, whereas a descriptive norm is an understanding of what actually *is* done (Cialdini et al., 1991). Both types of norms may influence behaviour, depending on which is the current focus of attention. Therefore, if one tries to encourage the adoption of a new pro-environmental behaviour by only transmitting the message that this behaviour ought to be done, then focus theory suggests that the attempt may be crippled if people focus on the fact that the behaviour is currently engaged in by few others. When the two norms align (i.e., the descriptive norm matches the injunctive norm), individuals are more likely to behave in accordance with them (Cialdini, 2003). Consequently, in order to maximize the potential that a novel pro-environmental behaviour, such as composting, be adopted by the population, focus theory suggests that individuals should perceive it both as good (socially approved of – the injunctive norm) and widely practiced (descriptive norm). The intervention used in the current study is based on the principles of the focus theory of normative conduct.

Non-normative behavioural interventions. Several studies on recycling, littering, and stair use have shown that non-normative approaches can be useful in encouraging appropriate behaviour, but they can have certain drawbacks as well. Incentive programs, for example, can be useful in reducing litter or increasing recycling (Bacon-Prue, Blount, Pickering, & Drabman, 1980; Casey & Lloyd, 1977; Clark, Burgess, & Hendee, 1972). However, they can sometimes also have the environmentally destructive effect of encouraging more consumption in order to have more litter or recycling to turn in. In addition, if the participants

are purely motivated by an external reward, then once the reinforcement is removed (program stopped), the desired behaviour may fade away. Indeed, such studies with a follow-up component appear to demonstrate this (see Porter, Leeming, & Dwyer, 1995 for a review).

Structural changes to the environment are also capable of encouraging behaviour change (Bungum, Meacham, & Truax, 2007; Liu & Sibley, 2004; Van Houten, Nau, & Merrigan, 1981), but there may be an upper limit to what the environment alone can accomplish, and structural changes such as adding more garbage cans to reduce littering were not found to be effective in at least two studies (Bacon-Prue et al., 1980; Burgess, Clark, & Hendee, 1971). Additionally, changes involving the design or construction of a building can be costly or impossible once the building has been built. Social norms approaches to increasing pro-environmental behaviour are relatively cheap and have the potential to be self-perpetuating.

Conformity to norms. The pressure to conform to group norms has been studied for over 50 years (Asch, 1956) and is now well established (see Cialdini & Goldstein, 2004 for a review). It is particularly likely to occur when people are unclear how to behave (Smith, Hogg, Martin, & Terry, 2007) and when the norm is salient (Wellen, Hogg, & Terry, 1998). One report has shown that even individuals with a "low conforming" personality (measured by the California Personality Inventory) are liable to conform to group norms (Belvedere & Pasewark, 1976). Sociological studies have demonstrated that once a pro-environmental culture is established in a population, individuals within it are prone to behaving ecologically (Guerin, Crete, & Mercier, 2001; Higgs & McMillan, 2006), and they feel embarrassed when behaving in a manner contrary to the norm (Grasmick, Bursik, & Kinsey, 1991). Therefore,

establishing the perception of a culture of sustainability (where pro-environmental behaviour appears to be a social norm) may be a useful way to increase pro-environmental behaviour.

The current study uses a focus theory approach in which signs deliver an injunctive norm message and confederate models help create the impression that composting is already practiced by others. The effectiveness of signs and models as behavioural interventions have been evaluated by several researchers in the areas of littering, recycling, stair use (as opposed to elevators), child behaviour and others (e.g., Huffman, Grossnickle, Cope, & Huffman, 1995; Porter et al., 1995).

CHAPTER 2

Models and Signs as Behavioural Interventions

Modeling

The phenomenon of learning by observing others is well established (Bandura, 1977) and has been shown to occur in humans and non-humans (e.g., Thorhallsdottir, Provenza, & Balph, 1990). When a behaviour is learned vicariously, it is mapped to the same area of the brain in which it would be mapped if it were performed by the observer (Erlhagen, Mukovskiy, & Bicho, 2006). Although, behaviour adoption through social learning (Bandura, 1977) is slightly different from behaviour change due to pressures from social norms, both can include modeling as a vehicle for change, and as such are reviewed here.

Children. From a young age, children have been found to imitate adults (e.g, Dubanoski & Parton, 1971a), and peers (e.g., Owens & Ascione, 1991). Modeling can be used to change children's behaviour from what they previously learned (Allen & Liebert, 1969), as well as encouraging them to donate money to charity (Dressel & Midlarsky, 1978), distribute rewards equally (Crott, Oldigs, Reihl, & Wender, 1979), to share (Liebert & Fernandez, 1970), or become more aggressive (Dubanoski & Parton, 1971b). Even a child who is apparently friendless can act as an effective model for the learning of prosocial behaviour (Liebert, Fernandez, & Gill, 1969).

Children can influence parent values (e.g., Roest, Dubas, & Gerris, 2009) and behaviour (e.g., Dillon, 2002) as well. In coded interviews, one study reported that many parents' attitudes and behaviours toward recycling, littering, pollution, and the environment were affected their by their children (Dillon, 2002). Another study, conducted in Costa Rica, found that parents of children who received an environmental education course became more environmentally knowledgeable themselves (Vaughan, Gack, Solorazano, & Ray, 2003).

Adults. Studies investigating the subtle effects of adult models on others are also important in formulating hypotheses for the current study. Two well-designed early studies suggest that models can have an important effect on participants' behaviour. The first, from the health and diet literature (Rosenthal & Marx, 1979), found that when participants came to a lab for a "tasting experiment" they ate more crackers if they were in the experiment with another student (actually a confederate) who ate many crackers (regardless of whether they were successful or unsuccessful dieters). The second study, from the pro-environmental behaviour literature (Bégin, 1978), reported that students were more likely to sign a petition if another student (confederate) signed it first. Neither of these studies had the problem of non-independence among data points, a common issue for many of the studies in this area. Both studies also included inferential statistics and significance tests (the first also provided a measure of effect size), which is often absent in older studies of this type.

Recently, a study on tipping behaviour in French bakeries (Guéguen, 2007), found that if a confederate model tipped the staff (descriptive norm) then the next customer in line would be more likely to do so as well, and even give a larger sum. However, this study was conducted on three consecutive Saturdays and, hence, has the problem of possible non-independence among observations discussed above.

Litter. Anti-litter modeling research is particularly pertinent to the current study because it addresses the issue of social norms and a waste-disposal behaviour that is similar to composting. In the first brief communication on modeling litter pick-up, Bickman (1972) observed twenty subjects over the course of two hours pass by a confederate who was picking up a crushed pop can, and not a single one stopped to pick up anything themselves.

However, the scope of the study was very small and several subsequent studies by other authors found considerable efficacy for the procedure (see below).

In a study of dog litter that tried to encourage owners to "stoop and scoop" their dog's feces, Jason, Zolik and Matese (1979) found that signs were not effective in encouraging the behaviour, but that providing free plastic bags and a demonstration of how to do the procedure were. Although it did not investigate modeling in the classic sense, this early study provided some valuable insights. It used an A-B-C-A-C design (baseline, sign, demonstration, baseline, demonstration) and found that during the demonstration phases 82%-84% of dog owners properly picked up after their dogs within the study area.

However, the Jason et al. study (1979) also had several methodological flaws which made the change in behaviour difficult to attribute to the demonstration alone. For example, the demonstration was accompanied by a free bag (a structural solution) and the bag may have been more effective than the demonstration as the cause of the change in behaviour. In addition, given that the study lasted several weeks, dog owners who did not want to perform the behaviour may have taken to avoiding the study area once they realized that they would be asked to "stoop and scoop" if they entered it, thereby artificially inflating the percentage of recommended behaviours. Indeed, the percentage of appropriate litter pickup did not return to baseline levels when the demonstration was removed (suggesting that perhaps an outside influence may have contributed to the increase).

The first empirical test of the effects of subtle anti-litter modeling in a "lead by example" sense was conducted by Wagstaff and Wilson (1988). They found that if a rafting trip leader gave a verbal request to pick up garbage and later did so in a clearly visible manner, then rafting participants would be more likely to pick up the garbage that was

planted at their campsite. Although not explicitly described as such, the verbal prompt could be interpreted as an injunctive norm message and the modeling could serve as a descriptive norm. However, this modeling was carried out by an authority figure and not a peer, and whether this effect was attributable to the verbal message, the modeling or a combination of the two is difficult to ascertain. In addition, the sample size was very small ($N = 8$ in each condition) and results were only significant at $p < .10$ with no effect size reported. Nevertheless, the study lends support to the notion that modeling pro-environmental behaviour may be an effective way of encouraging behaviour.

Models and social norm manipulations were used to decrease littering in public places in four classic experiments from one published study (Cialdini, Reno, & Kallgren, 1990). In the paradigm, handbills were put on the windshields of customers in a shopping mall parking garage and the area surrounding the car was either made to look littered or clean. When the customer approached the car, a confederate model would either litter or simply walk by. They found that a model that littered was capable of increasing *or decreasing* littering behaviour, based on which type of social norm he/she highlighted. Apparently, seeing a model litter in a clean environment did not highlight the descriptive norm that others litter. Instead, it brought to attention the cleanliness of the garage and the fact that nobody else in the parking lot littered other than this norm-breaking customer. Of course, observing a model litter into an already littered environment made littering by the subject much more likely because the descriptive norm that was highlighted was “everybody litters.”

In another experiment Cialdini et al. (1990) demonstrated that when injunctive norms and descriptive norms did not align, predicting behaviour was difficult. If the injunctive norm suggested that littering was wrong and the descriptive norm showed that littering was

commonly practiced (there were many handbills on the ground, but they were nicely swept off to the side), then litter rates were between what would be expected if the norms aligned in either direction. That is, littering occurred less frequently than if there were simply many handbills strewn about, but more frequently than if the environment was clean. This series of experiments was important in demonstrating the effects of descriptive and injunctive social norms on waste disposal behaviour, as well as the effectiveness of modeling in highlighting these norms.

In 1982, an article published in The Atlantic Monthly (a non-peer-reviewed journal) launched a theory known as the Broken Windows Theory (Wilson & Kelling, 1982). The article discussed the use of police foot-patrols and strictly enforcing laws against misdemeanours, such as breaking windows or littering, as a means of preventing the spread of disorder, and possibly more serious crimes as well. The theory was supported by the results of a 40-city study conducted in 1990 (Skogan, 1990) and an earlier study which found that an abandoned car would be vandalized if it was already damaged (Zimbardo, 1969). It gained considerable popularity after New York City adopted it for its policing policy and experienced a subsequent reduction in crime (Harcourt, 2001). The policing and litter-clean up practices of several cities were consequently affected, but the actual efficacy of the Broken Windows Theory was still in dispute (Harcourt, 2001; Harcourt, 2006; Lehrer, 2002). The theory discusses two aspects of the issue: the effectiveness of punishing minor crimes, and the ability of negative social norms to perpetuate themselves (and encourage other negative behaviours). In most cases, however, it is only the effectiveness of strict punishment that is criticized; the ability of social norms to affect behaviour still appears to be valid (Keize, Lindenberg, & Steg, 2008). In the only empirical study of the Broken Windows

Theory that I am aware of, participants were more likely to litter if they were in an environment that had graffiti than if they were in the same environment without it (Keize et al., 2008).

Signs

Evidence from the litter, recycling and health fields for the efficacy of signs as a behavioural intervention strategy is mixed. Apparently, only a well-constructed sign in an appropriate location has the potential to change behaviour, and achieving these aims can be difficult. Effective visual prompts have five characteristics: (a) The target behaviour is relatively convenient to emit (unless consequence strategies are applied), (b) the desirable or undesirable behaviour is specified in precise terms, (c) convenient alternative desirable behaviours are indicated when avoidance of an undesired behaviour is targeted, (d) the message is delivered in close proximity to opportunities for emitting the target behaviour (e.g., as in point of purchase advertising), (e) the message is stated in polite language that does not threaten an individual's "perceived freedom" (Geller, Winett, & Everett, 1982).

Using these principles, researchers have been able to improve point-of-decision signs to the point that they are effective in encouraging polystyrene recycling, litter cleanup after eating in cafeterias (Craig & Leland, 1983; Dixon, Knott, Rowsell, & Sheldon, 1992; Werner, Rhodes, & Partain, 1998) and many other behaviours (e.g., Baltes & Hayward, 1976; Geller, Witmer, & Orebaugh, 1976; H. D. Johnson, Sholcosky, Gabello, Ragni, & Ogonosky, 2003).

However, these principles are not always equally important. In one particularly relevant study, table-top signs were used in a university cafeteria to reduce littering (Durdan, Reeder, & Hecht, 1985). The signs were equally effective in reducing litter; whether they had a

specific message ("Place your tray and dishes in the tray holders along the west wall") or non-specific message ("Clear your own table") did not matter. This finding is particularly relevant to the current study because it used an identical sign-placement procedure (i.e., table-top signs).

Observers who are in a good mood are more likely to recall poster information (Bennett, 1998), so a pleasant or funny visual prompt may also be effective, as long as it does not make the message ambiguous (Horsley, 1988). Some evidence also suggests that being exposed to a visual prompt in multiple forms is effective increasing recall and understanding (Foster, Aamodt, Bodenmiller, & Rodgers, 1988; Houghton, 1993) and that a thought-provoking sign may be most effective for encouraging recycling (Werner, White, Byerly, & Stoll, 2009). As well, traffic sign and computer lab studies suggest that noticeability, simplicity, and clarity are important aspects of sign design (Kline & Beitel, 1994; Manstead & Lee, 1979; Shieh & Lai, 2008; Williams, Thyer, Bailey, & Harrison, 1989). Signs providing regular feedback about the target behaviour can also be effective (Dixon & Moore, 1992; Dixon et al., 1992), but this procedure is labour-intensive and was, therefore, not considered for the present study.

A number of studies reported that adding a picture to a written communication made the communication more effective in (e.g., Houts, Doak, Doak, & Loscalzo, 2006; Perrine & Heather, 2000; Roberts et al., 2009; Van Meurs & Aristoff, 2009). One of the studies showed that a picture over a donation box significantly increased donations, but a short written phrase ("Even a penny will help") did not. In tourism advertising, pictures have been found to be especially effective in attracting the consumer and arousing a behavioural intention, whereas text is most powerful in conveying information (Decrop, 2007). Generally, pictures

appear to effectively improve signs unless there are so many that the message becomes clouded (Van Meurs & Aristoff, 2009). However, the appropriate picture should be chosen carefully because the context of the sign and its intended audience may be important factors in its effectiveness and a picture with incongruent text has been reported to confuse audiences (Jae, Delvecchio, & Cowles, 2008).

Many principles have been suggested for designing a sign, and it is unlikely that any sign would work in every given situation. Consequently, signs sometimes are ineffective. For example, when Louch (1999) attempted to improve signs at a local zoo to make them more "readable" using classic sign design principles, the amount of time visitors spent in the area looking at the enclosure, and reading the signs was actually reduced. Another researcher found that a sign designed to prevent shoplifting of frequently taken items, actually had the reverse effect of increasing shoplifting because those items became more salient and desirable to shoplifters (Thurber & Snow, 1980).

In health studies examining signs as a means of encouraging stair use (rather than elevators), a small difference in the sign (such as adding health information) meant the difference between an effective sign and one that was not significantly more effective than baseline (Webb & Eves, 2007; Wogalter, Begley, Scancorelli, & Brelsford, 1997). In other cases, signs were effective in increasing stair use, but not as effective as structural solutions such as adding music and artwork to the stairwell to make it more pleasant (Boutelle, Jeffery, Murray, & Schmitz, 2001), having the elevator doors open more slowly (Van Houten et al., 1981), or having the stairs situated within eyesight of the elevator (Bungum et al., 2007).

Well-constructed and well-placed signs have the potential to effectively influence readers' behaviour, and using them is common practice in litter and recycling studies

(behaviours which are similar to composting), as well as in businesses. Hence, table-top signs were chosen as a tool in this study to convey injunctive norm information.

Modeling Plus Signs

Several previous studies have evaluated the use of both signs and models together as antecedent strategies to modifying behaviour. The findings, along with the strengths and weaknesses of these studies, are reviewed next.

Turn down the volume. A study in which signs and models were used to encourage students in an elevator to turn down the volume of their portable music players was conducted by Ferrari and Chan (1991). The study consisted of two experiments. In the first, warning signs indicating the dangers of loud music and a picture of a walkman with a red circle and line through it were placed outside in the lobby and in the elevators. The study employed an A-B-A design (baseline for 9 days, signs for 6 days, baseline for 5 days), and found that there was less audible music coming from students' headsets in the elevator during the intervention (59%) than during the baseline phases (85% and 76%). In the second study (9 weeks later), two confederate models entered the elevator and one would ask the other to turn down the volume of his or her walkman. Then they would note whether or not other students in the elevator would also reduce the volume of their headsets. This experiment employed an A-B-A-B design (baseline, model, baseline, model, for 22 days) and found that 29% of students with loud headsets turned them down or removed them during the modeling phases (and none did during the baseline phases). However, the researchers did not compare the relative effects of the signs and models, and the signs were removed during the second study so researchers could not tell if there was an additive effect (i.e., signs + models could have been greater than just signs or just models). Furthermore, the authors did not report any

inferential statistics, significance tests, or effect sizes to strengthen their claim that the interventions were effective. The procedure did demonstrate that signs could transmit an injunctive norm successfully, and that this norm could be used to change behaviour. Similarly, the modeling procedure successfully highlighted the descriptive norm, which was also an effective behavioural intervention.

Water conservation. The sign and model approach was used by Aronson and O'Leary (1982-83) to encourage water conservation by students in gym showers. In the baseline phase, a small sign was placed in the men's locker-room communal shower with the instructions "Conserve Water: 1. Wet Down 2. Water Off 3. Soap 4. Rinse." During this phase only 6% of students followed the instructions. In the second phase, a larger version of the sign was placed on the way to the shower so that students had to step around it to get in. Although 93% of students saw the sign, only 19%-20% followed the directions. During the third phase, the sign was left where it was and a confederate of the study stood in the shower and performed the prescribed behaviour in view of other showering students. In this condition, 49% of individuals performed the behaviour. In the fourth phase, two students were used instead of one and 67% of the students were found to comply with the instructions.

This study again provided evidence that a descriptive norm (demonstrated by modeling) was capable of affecting behaviour. The salience of the descriptive norm marker (two people rather than one) appears to be an important factor affecting compliance rates. By keeping the sign in place while the models were introduced into the paradigm, the results suggest that the models have an effect on behaviour beyond that of the signs, but whether it is the combination of signs and models that is important or the models on their own cannot be determined. Again, no significance testing or follow-up was used in this study.

Composting. A preliminary study of signs and models conducted at the University of Victoria (Sussman, Greeno, Scannell, & Gifford, 2008, submitted), sought to build on the findings of Aronson and O'Leary (1982-83) by applying the paradigm to public composting in a university cafeteria. Some of the limitations of previous studies were addressed by applying chi-square significance tests and implementing a follow-up phase.

The study consisted of observing a cafeteria compost bin for five weeks during lunch hours (two hours a day, five days a week). During the first week (baseline), a standard university informational sign (words only) was used above the bin describing what could and could not be placed in it. Only 13% of cafeteria patrons composted appropriately during this week. In the second week, the sign above the bin was improved, and new table-top signs were created using Geller et al.'s (1982) principles for sign design. Notably, the table-top signs were created with a general injunctive norm message about the importance of composting, and the bin sign (located at the point-of-decision) contained a specific, clear message about how to compost.

During the second week, 21% of diners composted appropriately – a significant improvement. In the third week, with all the signs still in place, one model demonstrated composting to unsuspecting customers by getting up in front of them when they approached the waste disposal area and properly separating his or her leftovers. A non-significant increase of 4% from the previous week (25% of students overall) composted appropriately after seeing one model. However, when two models performed the behaviour in front of other diners, and talked about it, the percentage of appropriate composters rose significantly to 42%. Dialogue between two confederates was a simple and subtle way to increase the salience of the models. It was the primary method by which models affected participant

behaviour in the "turn down the volume" study described above (Ferrari & Chan, 1991) and there is considerable research demonstrating that audiences can learn and recall information overheard in others' conversations (e.g., Akhtar, 2005; Fox Tree, 1999; Tree & Mayer, 2008), and that it can affect their behaviour (Jones & Skarlicki, 2005).

During a four-day follow-up (with the signs but not the models), the percentage of appropriate composting by students remained at 35% (a non-significant decrease from the two-model phase). Once again, the presence of two models who talked to each other about composting increased the salience of the descriptive norm and made the intervention more effective. This is consistent with the previous research by Aronson and O'Leary (1982-83), as well as research on modeling for children (Liebert & Fernandez, 1970); although those studies did not incorporate discussions between the models. However, this preliminary study may have been limited by the problem of non-independence of observations (over the course of five weeks students may have been observed multiple times). Therefore, it is difficult to rule out the passage of time and mere exposure as the basis for behaviour change. Also, whether the significant effect of the second week (signs) can be attributed to the improved bin sign or to the table-top signs is hard to determine. Finally, this study (like many similar studies) was conducted with a primarily-student population, which may be different from a community population (e.g., people outside the university may have less pro-environmental values).

Objective

The objective of the current study was to address the knowledge gap in the behavioural intervention literature by conducting a study in the general population that took into account the limitations of previous research.

Summary of the Current Study

The study was conducted for one day in each of three locations. At each location, a single compost bin was placed next to one of the facility's garbage bins and customers who approached the area with compostable waste on their trays were observed. Some of the tables in each facility had table-top signs on them conveying the injunctive norm message that composting is a good idea. In addition, two confederate-models sat at a table near the compost bin and attempted to demonstrate appropriate composting to half of the diners who approached the compost and garbage bins with compostable waste on their trays. In this quasi-experimental design, diners who approached the bin found themselves in one of four possible conditions (no model and no sign, sign and no model, model and no sign, sign and model). Observers noted which condition the diner was in and whether or not the diner composted appropriately. Some diners were then briefly interviewed after disposing of their waste to gauge their knowledge of the study and their self-reported reasons for composting or not.

Hypotheses

Hypothesis 1: Diners exposed to models depicting a descriptive norm of composting appropriately will be more likely than unexposed controls to compost appropriately.

Hypothesis 2: Diners exposed to a sign on their table with an injunctive norm message about the virtues of composting will be more likely to compost appropriately than those without a sign.

Hypothesis 3: Diners exposed to both an injunctive and descriptive pro-composting norm (a sign on the table and the models), will be the most likely to compost appropriately.

CHAPTER 3
Method

Design

The study employed naturalistic observation of individuals in three locations under four conditions (in a 2x2 design) in a quasi-experimental design. Participants were either exposed to a model, sign, neither, or both. Some patrons also participated in brief post-observation interviews.

Setting

Two Victoria shopping malls (Mayfair Shopping Centre and Hillside Centre), and one independently owned fast-food restaurant (Beacon Drive In) participated in the study. The research team brought its own composting bin to each location for the day and placed it next to the facilities' garbage and recycling bins. The bin was placed in the eating area next to the waste bin and observed during the busiest operating times (eight to ten hours between 10 am and 7 pm).

Mayfair Shopping Centre and Hillside Centre, located in the mid-town area of Victoria, are medium-sized shopping malls with 100 to 120 stores including one or two large department stores. Mayfair appears to draw slightly more upscale shoppers and have fewer seniors and children. Both food courts have about a dozen fast food outlets that offer a wide variety of foods and snacks in an assortment of compostable and non-compostable packages. The Beacon Drive In is a local, independently owned "burgers and shakes"-type restaurant well known for its soft-serve ice cream (which has won several awards in the 30+ years of its existence). It is a small but busy restaurant with indoor seating, patio seating, and a drive-up pick-up window. The Beacon Drive In attracts more seniors and families, and offers a smaller selection of food than the shopping mall food courts. In order to obtain a sufficiently

large sample, observations were recorded over two days at the Beacon Drive In. No space was available to conduct the study indoors, so it was conducted during the spring and summer on the patio. In all three locations, the primary items of waste which customers could compost were paper cups, wax paper containers or wrappers, and paper napkins. The primary items left after eating which could not be composted were plastic lids, styrofoam containers, and plastic cutlery. All three locations were observed during their busiest days – Saturday at Mayfair, Friday at Hillside, and Saturday and Sunday at the Beacon Drive In.

By observing the locations for one day each, the likelihood was high that observations were independent of one another. That is, two observations of the same diner were unlikely, given that a diner was unlikely to visit the same fast food location or shopping mall food court more than once in a day.[1] This represents a methodological improvement over many previous studies, in which participants were likely to be observed multiple times during the course of the study.

Participants

The participants (N = 562) were patrons of the three eateries who had finished eating and had compostable waste remaining on their plates. These included a roughly equal number of males (47%) and females (53%).

[1] A small number of regular customers may have been observed twice over the two days of observation at the Beacon Drive In. In my estimation this was perhaps a maximum of 10 people accounting for 20 observations out of 154. However, I have no way of knowing with certainty if this estimation is accurate.

Procedure

Diners found themselves in one of four possible conditions based on where they sat to eat and whether the models were able to demonstrate the behaviour for them: No sign and No models, Sign and No models, Models and No sign, Sign and Models.

Signs. Simple three-panel signs were created for the study by laminating 8.5" x 11" coloured sheets of paper and folding them in thirds so they form a triangle which was placed on table tops in a place that could not easily be ignored. Most participants who had a sign on their table had to move it out of the way slightly in order to be able to fit their food on the table. Of the 106 participants interviewed after the study, 11% said that they did not notice a sign when it was on their table, and 20% noticed a sign when it was not on their table (on another table). Research on subtle effects (e.g., Williams & Bargh, 2008) suggests that despite not consciously recalling the sign, participants with a sign on their table may have still been affected by it.[2]

The signs (both over the bin and on the tables) were designed using principles suggested by Geller et al. (1982). The table top sign contained three panels (one on each side) that was polite ("Please Compost Your Leftovers" written at the top) and contained a simple memorable picture (see Figure 1). The injunctive norm messages were presented as point form notes regarding general waste and consumption followed by a point on why composting is a good thing. In an earlier study, the behavioural specificity of table-top signs was not found to be an important factor in their effectiveness for reducing litter (Durdan et al., 1985); a general message could be just as useful. The point-of-decision sign above the compost bin,

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[2] Therefore, even participants without signs on their tables who did not report seeing them may have been subtly affected by them.

however, was specific and clearly outlined what could and could not be composted (see Figure 2).

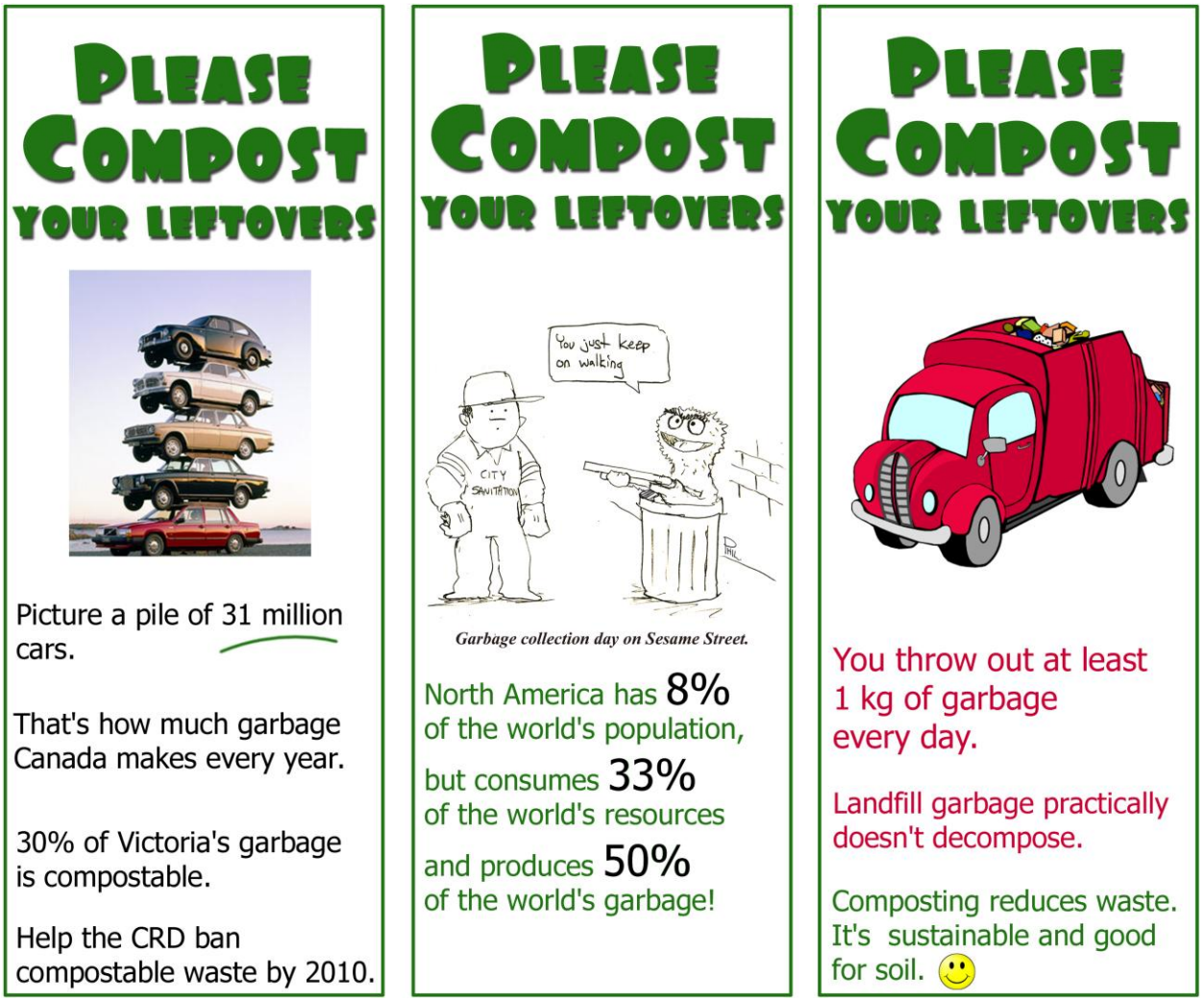


Figure 1. Table top sign was folded into a triangle and placed on tables to convey injunctive norm message

Figure 2. Sign above compost bin conveyed clear and specific instructions on how to compost

To optimally develop the signs, a small survey (N = 12) was conducted. Undergraduate students from an upper-level environmental psychology seminar rated each panel of the table-top signs from 1, "Very Ineffective" to 10, "Very Effective." Previous research has found that student ratings of signs may not be significantly different from that of experts (Ben-Bassat & Shinar, 2006). Mean evaluations of effectiveness were quite high for each panel of the table-top sign (Ms > 6.80). Thus, the survey showed that the signs were perceived to be quite effective by a group of students who were not familiar with the current study. Nevertheless, a few comments and suggestions from participants were used to improve the signs. For instance, a more readable font was selected, and information on the signs was changed to emphasize local issues. The signs were placed on some tables in each location and not on others in areas which could be easily viewed by the observer (see Figures 3-6). Patrons found themselves in the “sign” or “no sign” conditions based on their semi-random selection of a table.

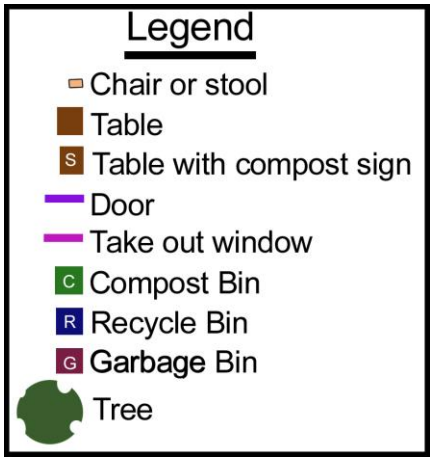


Figure 3. Legend for topographical maps

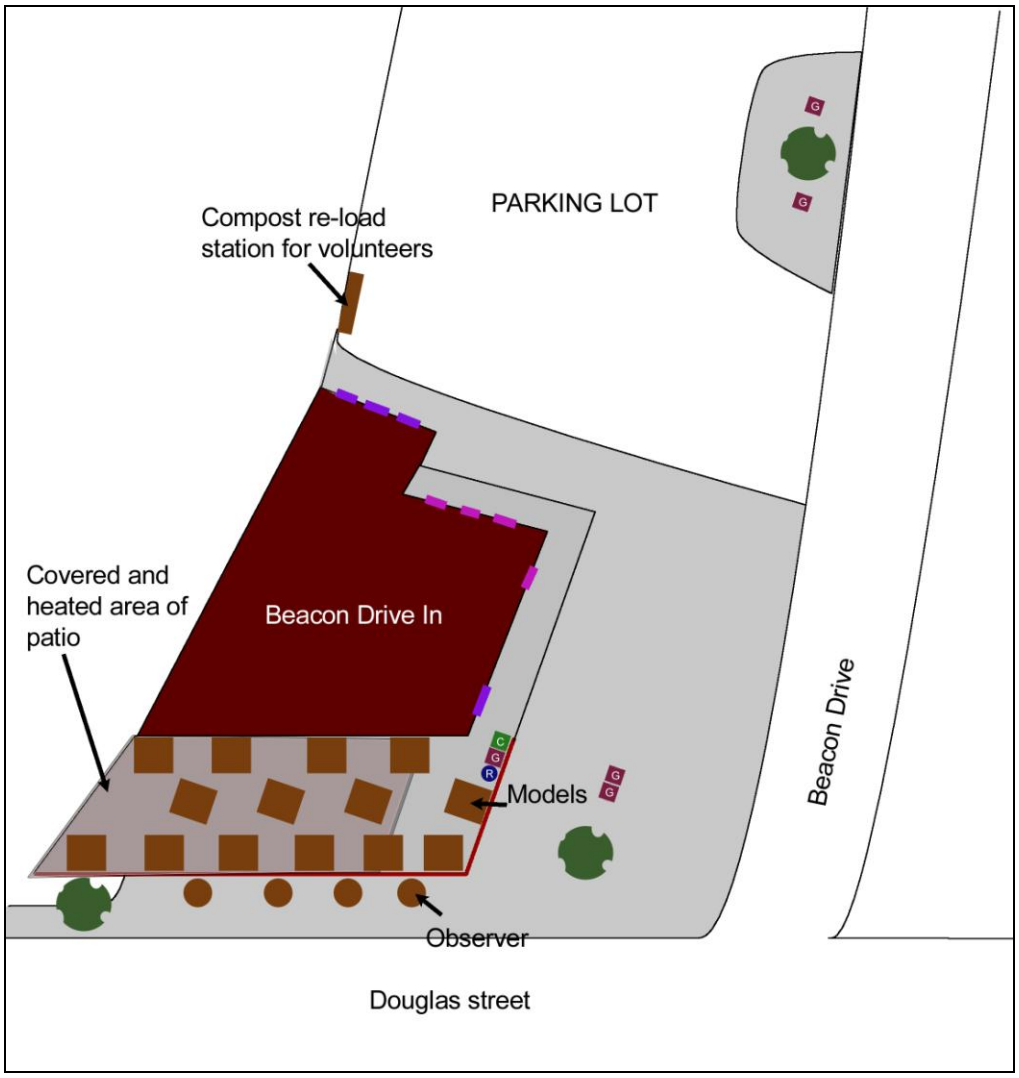
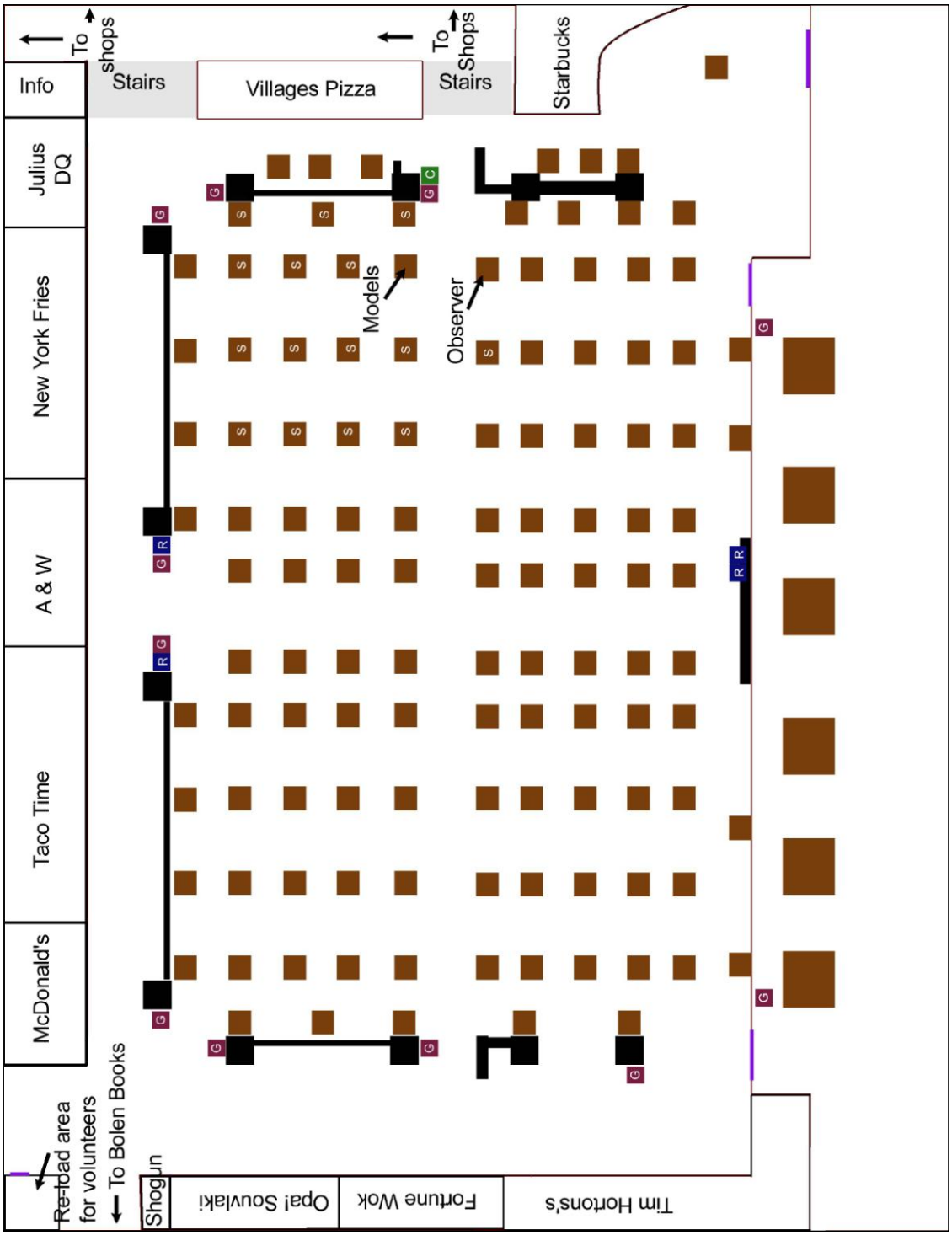


Figure 4. Topographical map of Beacon Drive In (not to scale)



Map Created by Reuven Sussman

Figure 5. Topographical map of Hillside Centre food court (not to scale)

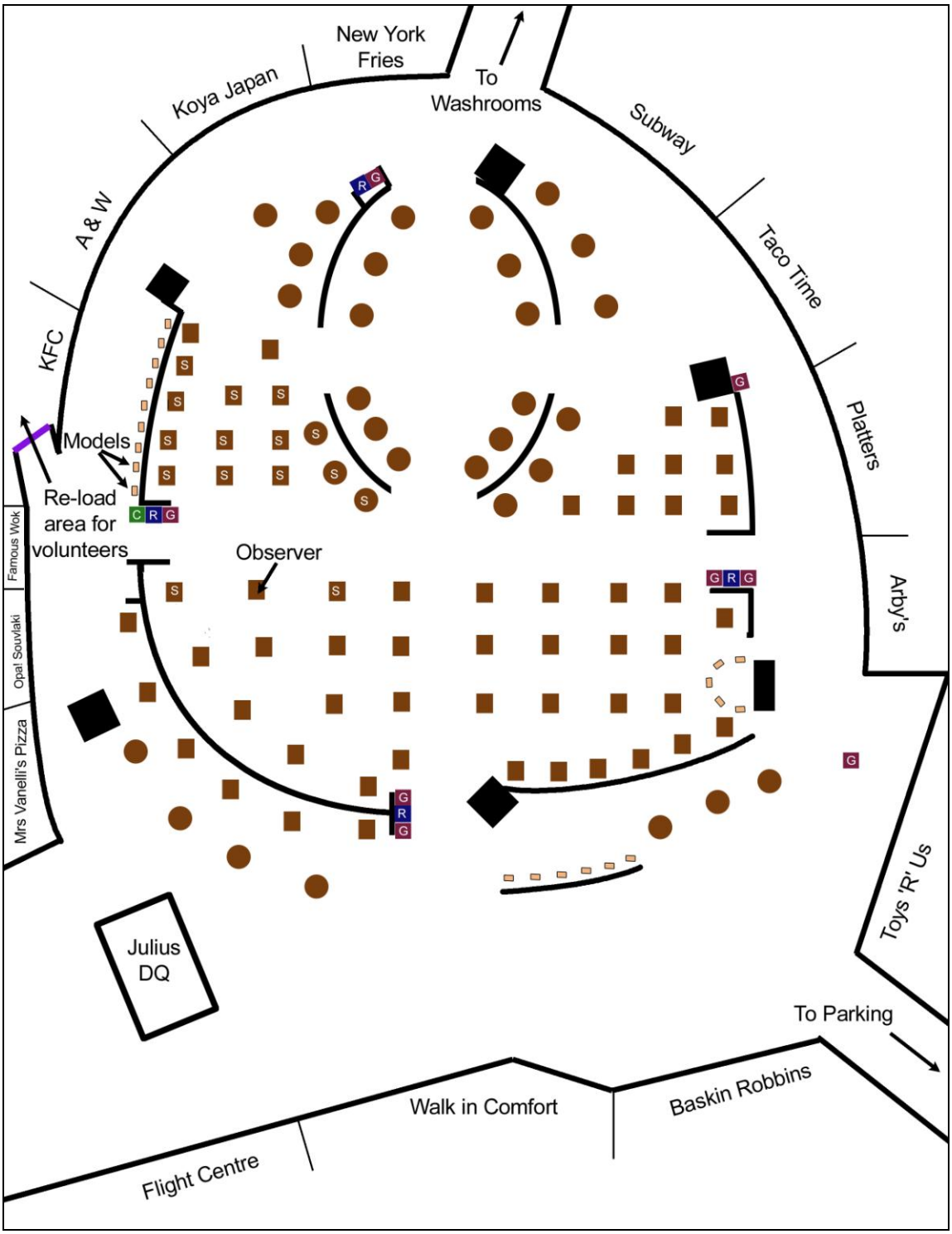


Figure 6. Topographical map of Mayfair Shopping Centre food court (not to scale)

Typically, diners in the shopping malls appeared to choose tables based on their proximity to the restaurant at which they purchased their meals, proximity to their destination (after eating), and distance from other diners, but no conclusive pattern could be deduced. Occasionally, diners ate their meals in one area of the food court and then disposed of their waste in an entirely different area because it was the direction they were going after eating. At the Beacon Drive In, observations were conducted on the patio and the weather was sometimes rather cool (despite being summertime). Therefore, diners typically chose a table based on distance from other diners, as well as temperature (in the sun if it was nice, under the heater or in the restaurant if it was cool); although again, a definite pattern could not be delineated. Table-top signs at the Beacon Drive In were approximately equally dispersed to tables in all areas of the patio (sunny seats, seats under the heater, etc.) but not inside the restaurant.

Models. Twenty eight volunteers combined to form 23 pairs of confederates to act as models at each location. They were recruited through announcements at various psychology classes, psychology department email lists, friends, and the first year psychology credit system. Most volunteer confederates were students in their 20s, but one was a middle-aged professor and one was a 13-year-old adolescent. Given the diversity of ethnicities and ages of the models, they did not stand out from other customers. Pairs of models were used as opposed to single diners because single diners did not appear to be effective models in my previous study (Sussman et al., 2008, submitted).

The models sat at a table close to the garbage and compost bins (see Figure 7), and when they noticed a diner approaching the area, they pretended to have finished eating, rose and separated their waste appropriately into the compost and garbage bins. Before

composting (and in the presence of the customer), one model asked the other if he or she thought it would be okay to compost a certain item, to which the first model responded "Yeah, it's on the sign [and pointed to the sign above the bin]." After composting, the models refilled their plates with dining-related waste in a room adjacent to the eatery and returned to their seats by the compost bin. They were always sure to include at least one compostable and one non-compostable item on their plates, and in most cases they also included an item such as a paper cup with a plastic lid which had to be disassembled and placed partly in the compost and partly in the garbage. Models were instructed to model the behaviour for approximately 50% of all diners at random. However, if models were re-filling their plates when a diner approached the waste disposal area, or if the diner approached suddenly from an unexpected direction, models were unable to demonstrate the behaviour to the diner before he or she got to the compost bin. For these reasons only 36% of diners (all locations pooled) were exposed to the models in a quasi-random fashion.

Photo by Reuven Sussman with permission of Jaclyn Cassler, Megan Cohoe-Kennedy and Matthew Stafford

Figure 7. Observations at the Beacon Drive In took place on the patio

Outcome measures. Unlike my previous study (Sussman et al., 2008, submitted), which was conducted in a university cafeteria, compostable waste at the three community locations chosen for this study was almost entirely paper, meat, or wood products. These are unusual compost items that could only be composted in this case because an industrial composter was used. In that study, compostable waste was divided into "usual" items (orange peels, French fries, etc.) and "unusual" items – leading to four different types of composting behaviour. In this case, however, appropriate composting was recorded as a dichotomous "yes-no" variable because of the lack of variability in waste types. "Appropriate composting" was defined as disposing of all compostable items in the compost bin and all non-compostable items in the garbage bin. A sub-type of inappropriate composting which was of interest to us was the disposing of garbage in the compost bin. The primary outcome measure was the percentage of customers who composted appropriately.

The compost bin. The compost bin employed for this study was custom built by a professional carpenter to appear both distinctive and appropriate in all three locations. It had a wood-panel exterior with removable plastic bin inside which could be lined with a biodegradable 33 litre bag (see Figure 8). Above the bin was an 11" x 17" full-colour sign which described in words and images what could and could not be composted (see Appendix 2, Figure 2). The sign placed over the compost bin was designed for each location. For example, the Mayfair sign contained a picture of a KFC box, whereas the Beacon Drive In sign contained a picture of a generic French fries box, and the Hillside sign depicted a Tim Horton's wrapper (among other items on each sign). Based on my previous study (Sussman et al., 2008, submitted), items which I believed were most likely to be mis-disposed were added to the signs.

Pictures by Reuven Sussman

Figure 8. Compost bin

Exit interviews. One experimenter waited outside of the eating area of each location to ask diners several questions. The length of the interview was kept very short because each location stipulated that customers "not be bothered," and many interviews often had to be conducted in quick succession. Three semi-structured questions were asked: (1) "I noticed that you were just in the [name of restaurant]. Did you notice a compost bin? [if yes] did you use it? Why or why not?"; (2) "Did you notice a sign encouraging composting? Do you remember what it said?"; and (3) "Did you notice any unusual customer behaviour in the restaurant? What was it?" At each location, 18%-21% of customers were interviewed because others either refused or left too quickly, or because too few experimenters were present at that time to both conduct interviews and observe behaviour.

Observation. Two trained observers (a paid research assistant and I) took turns watching customers throughout the course of each day. We were discreetly positioned in a location in the eating area that allowed them to see the garbage and compost bins, which tables had signs, and the models (see Figures 3-6). We recorded our observations on a data sheet and double-entered them (to ensure there were no data-entry errors) using Microsoft Excel upon returning to the lab. For the two shopping mall locations, a note was made whenever diners ate (and disposed of their waste) in groups to allow sub-analyses of these observations.

Compost services. Composting services were generously donated by reFUSE, a local Victoria commercial composting facility. Following each day of the study, all of the compostable waste collected on that day was picked up by reFUSE from the study location and brought to the facilities in Esquimalt (an area of greater Victoria). Pick-ups were made as part of reFUSE's regular rounds to businesses across Victoria. All of the study locations were advised to contact reFUSE if they wanted to implement a permanent composting program.

CHAPTER 4

Results

The characteristics of each location that participated in the current study differed in important ways. They each offered a different variety of food options (with different packaging), had a unique seating arrangement, and attracted a different clientele. Therefore, the data from each location was analyzed independently. However, as noted below, the results from each location were apparently similar, and consequently I decided to pool the data for an overall analysis as well.

Hierarchical Log-linear Analysis

For each location, and for the overall analysis, a three-way hierarchical log-linear analysis was conducted to determine the significance of signs, models and both together as predictors of appropriate composting. Hierarchical log-linear analysis allows assessment of the associations between three categorical variables, and the determination importance of effects (Tabachnick & Fidell, 2007). A hierarchical log-linear analysis is capable of revealing which variables, if any, should be included in the final model using backward elimination (Tabachnick & Fidell, 2007). The significance of each variable and each combination of variables as predictors of one another is tested in a stepwise fashion, and the weakest predictor is deleted in each step – until only significant predictors remain. In our study, three categorical variables were included (models, signs, composted appropriately). Given that I was only interested in the prediction of the variable "composted appropriately" by signs, models or the combination of both, only the significance of the interactions "sign x composted appropriately," "model x composted appropriately," and "sign x model x composted appropriately" were reported here. The significance of the interaction "sign x

model," and each individual level-one variable ("sign," "model," and "composted appropriately"), lacked meaning in the context of this study and were, therefore, disregarded. The goodness of fit for each final model (at each location, and all three locations together) was evaluated using a chi-square test, and parameter estimates were generated for statistically significant effects at each level. These parameter effects were used as measures of effect size (λ) (Tabachnick & Fidell, 2007). An advantage of Hierarchical log-linear analysis is that it is relatively free of limitations. The only assumptions that must be met are that the observations are independent of one another, the sample size is sufficient, and few or no cells in the contingency table contain fewer than five observations. No specific guidelines describe exactly what number of observations is the overall minimum but, in general, it is difficult to detect a rare event in a table with many cells and few observations (Tabachnick & Fidell, 2007). One statistical handbook suggests that log-linear analysis may be performed if no more than 20% of cells contain fewer than five observations (Tabachnick & Fidell, 2007). The data collected for this study met all three assumptions.

Mayfair Shopping Centre

At Mayfair, 178 food court patrons were observed, six of which were dropped from the analysis because observers were not sure whether they were exposed to the models, sign, or both. Forty-four percent of the diners were male, 36% had a sign on their table, and 48% were exposed to the models (see Table 1). Overall, 22% of all observed patrons composted appropriately (see Table 2).

Table 1

Percentage of diners in each condition for Mayfair Shopping Centre

	No Models	Models	TOTAL
No Sign	73 (42%)	37 (22%)	110 (64%)
Sign	17 (10%)	45 (26%)	62 (36%)
TOTAL	90 (52%)	82 (48%)	172 (100%)

One cell in the contingency table had fewer than five observations (Yes sign x No models x Yes composted appropriately, see Table 2), but this is acceptable because it comprised fewer than 20% of the cells (Tabachnick & Fidell, 2007). Using backwards elimination, the three-way interaction of Models x Sign x Composted Appropriately was not significant and therefore was not included in the final model, but the two-way interactions were. The selected model had a likelihood ratio $\chi^2(2) = 1.53$, $p = .46$, indicating a good fit between observed frequencies and expected frequencies generated by it (Tabachnick & Fidell, 2007).

From the partial associations included in the final model, the Models x Compost Appropriately interaction was significant, partial $\chi^2(1) = 4.19$, $p = .04$, $\lambda = .26$, but the Sign x Compost Appropriately interaction was not, partial $\chi^2(1) = .27$, $p = .60$, $\lambda = -.10$. This suggests that correctly composting occurred significantly more frequently in the Models condition (28%) than in the No Models condition (16%, Table 2), and that signs had little effect on composting behaviour either on their own or in combination with the models.

Table 2

*Percentage of diners that **composted appropriately** at Mayfair Shopping Centre*

	No Models	Models	TOTAL
No Sign	13/73 (18%)	10/37 (27%)	23/110 (21%)
Sign	1/17 (6%)	13/45 (29%)	14/62 (23%)
TOTAL*	14/90 (16%)	23/82 (28%)	37/172 (22%)

Note. *There was a significant interaction between "models" and "composted appropriately," $p = .04$, indicating that the difference in composting rates between the Models and No Models conditions was significant.

Hillside Centre

Two hundred and thirty observations were recorded at the Hillside Centre food court; nine were dropped from the final analysis because observers were unsure whether the customer was exposed to the models, signs, or both. Forty-eight percent of the diners were male, 26% had a sign on their table, and 26% were exposed to the models (see Table 3). Overall, 16% of all observed diners composted appropriately in this location (see Table 4).

Table 3

Percentage of diners in each condition for Hillside Centre

	No Models	Models	TOTAL
No Sign	126 (57%)	37 (17%)	163 (74%)
Sign	40 (18%)	18 (8%)	58 (26%)
TOTAL	166 (75%)	55 (25%)	221 (100%)

As before, a three-way hierarchical log-linear analysis was conducted on data gathered at this location. Only one cell in the contingency table contained an observed frequency less than five (Yes sign x No models x Yes composted appropriately, see Table 2). The final model again included two-way interactions but not the three-way interaction of Models x Sign x Compost Appropriately, and fit the data well, $\chi^2(3) = 1.91$, $p = .59$. Like the Mayfair results, the Model x Compost Appropriately interaction at Hillside was significant, partial $\chi^2(1) = 6.06$, $p = .01$, $\lambda = .26$, but the Sign x Composted Appropriately interaction was not, partial $\chi^2(1) = .17$, $p = .68$, $\lambda = -.02$. At Hillside, customers composted appropriately significantly more frequently after observing the models than after not having observed them, and the percentages were nearly identical to those observed at Mayfair (27% with models, 13% without, see Table 4). Signs again had little effect on composting behaviour, either on their own or in combination with the models.

Table 4

*Percentage of diners that **composted appropriately** at Hillside Centre*

	No Models	Models	TOTAL
No Sign	17/126 (14%)	10/37 (27%)	27/163 (17%)
Sign	4/40 (10%)	5/18 (28%)	9/58 (16%)
TOTAL*	21/166 (13%)	15/55 (27%)	36/221 (16%)

Note. *There was a significant interaction between "models" and "composted appropriately," $p = .01$, indicating that the difference in composting rates between the Models and No Models conditions was significant.

Beacon Drive In

Observations at the Beacon Drive In took place on two separate days (one month apart) in order to achieve an adequate sample size. In total, 154 diners were observed (62 on day one, 92 on day two), and none were dropped from the final analysis. Fifty percent of the customers were male, 33% sat at a table with a sign, and 38% saw the models composting in front of them (see Table 5). Overall, 48% of all observed customers at the Beacon Drive In composted appropriately (see Table 6).

A three-way hierarchical log-linear analysis was again conducted. No cell in the contingency table contained fewer than five observations. The final model *did not* include the two-way Model x Composted Appropriately, or Sign x Composted Appropriately interactions, or the three-way Model x Sign x Composted Appropriately interaction, $\chi^2(5) = 6.57$, $p = .26$. However, based on the a-priori hypotheses, I decided to examine the two-way partial associations anyway, and found that the Model x Composted Appropriately interaction trended toward significance, partial $\chi^2(1) = 3.24$, $p = .07$, $\lambda = .14$. Customers who saw a model composted appropriately more often than customers who did not (57% vs. 43%, Table 6), but this difference was not significant. Signs, again, did not significantly affect composting rates, either on their own or in combination with the models.

Table 5

Percentage of diners in each condition for Beacon Drive In

	No Model	Model	TOTAL
No Sign	69 (45%)	34 (22%)	103 (67%)
Sign	27 (18%)	24 (16%)	51 (33%)
TOTAL	96 (63%)	58 (38%)	154 (100%)

Table 6

*Percentage of diners that **composted appropriately** at the Beacon Drive In*

	No Models	Models	TOTAL
No Sign	30/69 (44%)	21/34 (62%)	51/103 (50%)
Sign	11/27 (41%)	12/24 (50%)	23/51 (45%)
TOTAL	41/96 (43%)	33/58 (57%)	74/154 (48%)

All Three Locations Pooled Together

Despite the differences between all three study locations, the results appeared to indicate that all diners responded similarly to the signs and models. Therefore, the data from all three locations were pooled for an overall analysis. Five hundred forty seven observations were included for the overall analysis; 15 were dropped from the final analysis because observers were unsure whether the customer was exposed to the models, signs, or both. Forty-seven percent of the diners were male, 30% had a sign on their table, and 35% were exposed to the models (see Table 7). Overall, 27% of all observed diners composted appropriately (see Table 8 for a complete summary).

Table 7

Percentage of diners in each condition for all three locations pooled together

	No Model	Model	TOTAL
No Sign	268 (49%)	108 (20%)	376 (69%)
Sign	84 (15%)	87 (16%)	171 (31%)
TOTAL	352 (64%)	195 (36%)	547 (100%)

Table 8

*The percentage of diners that **composted appropriately** in each condition for all three locations*

	No Models		Models		
	No Sign	Sign	No Sign	Sign	TOTAL
Mayfair	13/73 (18%)	1/17 (6%)	10/37 (27%)	13/45 (29%)	37/172 (22%)
Hillside	17/126 (14%)	4/40 (10%)	10/37 (27%)	5/18 (28%)	36/221 (16%)
Beacon	30/69 (44%)	11/27 (41%)	21/34 (62%)	12/24 (50%)	74/154 (48%)
TOTAL	60/268 (22%)	16/84 (19%)	41/108 (38%)	30/87 (34%)	147/547 (27%)

A three-way hierarchical log-linear analysis was conducted on the pooled data. No cell in the contingency table contained an observed frequency less than five. As expected, the final model provided clear evidence of two-way interactions but not the three-way interaction of Models x Sign x Compost Appropriately. The model fit the data well, $\chi^2(2) = 0.67$, $p = .71$. Like the results from the two shopping mall locations, the Model x Compost Appropriately interaction was significant, partial $\chi^2(1) = 14.37$, $p < .001$, $\lambda = .19$, but the Sign x Composted Appropriately interaction was not, partial $\chi^2(1) = .41$, $p = .67$, $\lambda = -.04$. Overall, diners composted appropriately significantly more frequently after observing the models than after not having observed them (36% with models, 22% without, see Table 9 for a complete summary). Overall, signs had little effect on composting behaviour, either on their own or in combination with the models when data from all three locations were pooled together.

Table 9

Percentage of diners who composted appropriately in the Models and No models conditions

	No Models	Models	TOTAL
Mayfair*	14/93 (15%)	23/83 (28%)	ǂ37/176 (21%)
Hillside*	23/169 (14%)	16/58 (28%)	ǂ39/227 (17%)
Beacon	41/96 (43%)	33/58 (57%)	74/154 (48%)
TOTAL*	78/358 (22%)	72/199 (36%)	ǂ557 (100%)

Note. *Rates of composting appropriately were significantly different between Models and No Models conditions, $p < .05$

ǂDiners who were previously excluded because observers did not clearly see if they had a sign on their table were included here. Therefore, the total number of observations is slightly higher in Table 9 than Table 8 but the percentages are nearly identical.

Groups. At both Hillside Centre and Mayfair Shopping Centre observers noted whether the diners ate (and subsequently disposed of their waste) with another individual or group of individuals. A separate analysis was conducted for each location that excluded diners who ate with a group. At Hillside, this meant excluding 31 individuals (leaving 190), and at Mayfair, this meant excluding 39 individuals (leaving 133). In both locations, a greater percentage of customers still composted appropriately in the Models than the No Models condition (22% vs. 12% at Hillside, 22% vs. 15% at Mayfair), but the interaction was no longer strong enough to be included in the hierarchical log-linear model for Hillside, partial $\chi^2(1) = 2.36$, $p = .13$, $\lambda = .17$, or Mayfair, partial $\chi^2(1) = 1.41$, $p = .24$, $\lambda = .17$. A hierarchical log-linear analysis was conducted on only those customers who were part of a group at either location (i.e., Hillside pooled with Mayfair, $n = 70$), but the effect of models was not significant, partial $\chi^2(1) = 2.62$, $p = .11$, $\lambda = .23$. Although, no cell in the contingency table

contained fewer than five observations, the reasonable effect size ($\lambda = .23$) suggests that the influence of models may have been detected had there been a larger number of customers in this sub-analysis.

Mistakes

Thirty one diners (of 547, 6%) committed "composting mistakes" – disposing of non-compostable items in the compost bin (5% of all observations at Mayfair, 4% at Hillside, and 8% at the Beacon Drive In).

Interviews

In each of the three locations, some diners were approached for a brief interview after leaving the eating area. In total, 133 were approached and 106 agreed to answer the questions (21% of Mayfair participants, 18% of Hillside participants, and 18% of Beacon participants). The differences in appropriate composting rates between those that agreed to be interviewed (22%), those that refused to be interviewed (30%) and those that were not approached (27%) was not statistically different, $\chi^2(2) = 0.93$, $p = .63$; nor was the difference in the percentage of interviewed, approached and refused diners who were in the sign condition (35%, 26%, 31%), $\chi^2(2) = 0.94$, $p = .62$. However, there were significantly fewer diners approached for an interview (33%), than who refused an interview (49%) in the Models condition, $\chi^2(1) = 9.74$, $p < .01$. Despite apparent similarities between diners were interviewed, not approached or who refused interview, data should be interpreted with caution because only 19% of the observed diners agreed to participate in the brief interview (by answering at least one question) and diners were not approached based on a randomization procedure.

Reasons for composting. Thirty two of the diners that were interviewed composted correctly. However, very few of those that were interviewed provided elaborations of why

they chose to do so. The experimenter did not probe for an answer when one was not forthcoming, but two diners did volunteer answers, and they were both related to strong pro-environmental attitudes (e.g., “I was looking for the compost bin... I have kids... We need to save the planet”).

Reasons for not composting. Seventy four of the interviewed diners did not compost correctly, 29 of which claimed not to notice the bin. Reasons for not composting were provided by 35 diners. A large majority of these comments (20) were related to not knowing what could be composted in the industrial composter (e.g., “I didn’t have any food waste”), but a small proportion (7) stated that they only noticed the bin once they had already thrown away all their food waste (e.g., “I didn’t notice the bin until after I had thrown away all my garbage”). Only three diners provided reasons that might be considered laziness or a lack of caring for the environment (e.g., “I didn’t bother”). Interestingly, two diners that did not compost correctly still made statements about the benefits of composting which reflected a pro-composting attitude (e.g., “I think this is an easy way to help the environment”).

When modeling did not work. Thirty three of the diners that were interviewed were exposed to the models but did not compost appropriately. Of these, 14 claimed not to notice the bin. Of the remaining 19, comments were provided by 16 diners. Six diners stated that they only noticed the bin after throwing away their food, and four said that they did not think they had anything to compost when, in fact, they did (e.g., “I ate all my food”).

CHAPTER 5

Discussion

This study is the first to demonstrate that modeling can be an effective means of encouraging people in restaurants to compost. The hypothesis that diners would be more likely to compost after they were exposed to models who composted (descriptive norm) was supported, but the hypotheses that signs (injunctive norm) or signs and models combined would be effective in encouraging composting were rejected. These findings are discussed below.

Models

In all three study locations, diners were more likely to compost appropriately after witnessing two models demonstrating the behaviour ahead of them than when there were no models. The similarity of this finding across all three locations, along with good effect sizes (λ = .26, .26, and .14) suggests that this is a consistent finding.[3] Indeed, previous studies examining the effectiveness of modeling as a behavioural intervention have found it almost universally useful (e.g., Bégin, 1978; Guéguen, 2007; Wagstaff & Wilson, 1988), and studies that employed both signs and models generally reported that models were more effective (e.g., Aronson & O'Leary, 1982-83; Jason et al., 1979).

Composting models made salient the descriptive norm that other people in the restaurant were using the compost bin. This is one explanation as to why they were effective in encouraging composting among other diners; seeing the descriptive norm activated the

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[3] The significance of the effect of models at the Beacon Drive In was p = .07. Although this trend was not significant at the $p < .05$ level, there may have been a ceiling effect preventing significance in this case because the overall compost rates were unusually high (43% without models, 57% with models). Still, the pattern is clear.

implicit pressure to conform. However, an alternative explanation is that witnessing others composting provided diners with information as to what can and cannot be composted. That is, models showed other diners how to compost. In support of this explanation, most of the restaurant patrons who were interviewed and saw the bin but decided not to use it (n = 35), said that they "did not understand what to throw away." It is also consistent with the results of a home composting study in which participation was predicted by "how-to" knowledge rather than social norms (Edgerton, McKechnie, & Dunleavy, 2009). Although it is important to note that the authors of that study suggest that social norms may have been more important if they were clearly visible.

All things considered, the effectiveness of models was likely due to a combination of both descriptive norm activation and improved composting knowledge. Regardless of the mechanism by which models were effective, the result – increased composting – is of primary interest.

Signs

Unlike my previous study in which signs were effective (Sussman et al., 2008, submitted), restaurant patrons in this study with signs on their tables were not more likely to compost than those without. There are several potential explanations for this difference.

The first, and most likely explanation, is that in the previous study, during the week in which table top signs were introduced to the cafeteria, the sign above the compost bin was also improved. Hence, the significant increase in composting may have been related to the sign above the compost bin and not the table top signs. If the table top signs in the first study were, in fact, ineffective then it would be no surprise that the same signs did not increase composting in this study. As previous research has shown, creating effective signs is

difficult; a slight change in design or placement can mean the difference between being effective and being useless (e.g., Wogalter et al., 1997). In some cases, a sign can even have reverse effects (e.g., Thurber & Snow, 1980). Indeed, as opposed to modeling, previous research on signs has revealed that the intervention is less consistently effective in directing behaviour (e.g., Huffman et al., 1995). Future studies in this area should focus more specifically on exactly how to construct and display an effective sign in different settings.

A second explanation for the ineffectiveness of table top signs in this study but not my previous study is that the sample size may have been too small and the signs were only visible to patrons for one day. In the previous study, patrons viewed the signs for an entire week and the sample size was larger. However, these explanations seem improbable given the low effect sizes for signs in the current study (λ = -.02, and λ =-.10).

A third explanation is that the signs were relevant and effective in the university cafeteria, but not in public restaurants. Although the signs did not contain messages that were specific to the university or student values, student populations may be more apt to reading written material regarding pro-environmental behaviour. The University of Victoria, as an institution, is known to be highly environmentally conscientious, and in 2007, it won an eco-star award for pollution prevention (Capital Regional District, 2007). The elaboration likelihood model of persuasion (Petty, 1986) suggests that individuals who are engaged or invested in a topic are more likely to read, and be influenced by, messages that have high-quality elaborated arguments related to it (i.e., the central route of persuasion). By this model, students at the University of Victoria, that may have stronger pro-environmental values than members of the general community, may also be more affected by written messages about composting than the general population.

My previous study (Sussman et al., 2008, submitted), conducted in a university cafeteria over five weeks, may also have found different results for methodological reasons. The previous study had several limitations, such as non-independence among observations, which may have influenced the results. The current study attempted to address these limitations with improved methodology and therefore a significant sign effect may not have been found.

Observers noticed that diners at all three community locations had similar reactions to the signs. Most would move them aside slightly in order to make space for their food on the table. But some would read all three panels of the sign in detail while eating; particularly if they were eating alone. Sometimes, the signs were discussed as a topic of conversation by restaurant patrons. No negative reactions to the signs were noticed (e.g., crumpling it up or damaging it). The above reactions were noted only anecdotally and could not be tied to specific customer behaviour, nor could an exact estimate be made as to what number of diners had which reactions. However, this may be a type of observation that should be included in future studies of this type.

Models plus signs

One implication of the focus theory of normative conduct is that when injunctive and descriptive norms are aligned, behavioural compliance is greatest (Cialdini, 2003). In the current study, the injunctive norm highlighted by the signs, and the descriptive norm highlighted by the models, were both aligned towards pro-composting behaviour. However, I did not find an additive effect of being exposed to both signs and models. I believe that this may have been because the signs were ineffective in transmitting the injunctive norm message, and therefore the effect of seeing both the sign and models were not significantly

different from the effect of seeing just the models on their own. As discussed earlier, signs in isolation were not found to increase composting.

Other Findings

Shopping malls. Interestingly, diners in shopping mall food courts displayed considerably lower composting rates (14% to 28%) than those at the Beacon Drive In (43% to 57%) or the university in my first study (13% to 42%). There are at least two important factors that may account for this discrepancy.

The first is regarding a culture of materialism which is found in shopping centres. Malls are an epicentre of consumerism, where people come to buy goods and are constantly bombarded with pictures and messages espousing the value of materialism. Kasser (2006) has suggested that individuals high in materialistic values are prone to behaving in ecologically damaging ways. In Swartz' Value terms, this may be because materialism is positively related to self-enhancement, and negatively related to self-transcendence (Kilbourne, Grünhagen, & Foley, 2005). It has also been positively linked to power, achievement, hedonism and stimulation, and negatively linked to self direction, universalism, benevolence, tradition and conformity (Richins, Mick, & Monroe, 2004).

The second factor that may have accounted for low composting rates in the shopping centres is physical. The shopping mall food courts offer a far greater variety of food in a much more diverse array of containers. With fewer items to consider, the compost bin informational signs at the Beacon Drive In and the University could be less cluttered and more specific. This possibly made them more legible and less confusing to diners. In the brief interviews, 20 customers (out of 35) cited not knowing what to compost as the reason

that they did not use the bin. However, this was equally true in the Beacon Drive In as well as the shopping mall locations.

Groups. Sub-analyses of the two shopping centre locations with only single customers considered revealed that the effect of modeling disappeared. That is, diners who ate (and disposed of their waste) in groups were most influenced by the models. Without them in the analyses, exposure to composting models did not have a significant effect on diners' composting rates at either shopping mall ($p = .13$, $\lambda = .17$ and $p = .24$, $\lambda = .17$). Another sub-analysis examined only those diners who were in groups (at either location) and found that the effect of models was stronger ($\lambda = .23$), but still not significant ($p = .11$) because the sample size was too small ($n = 70$).

The importance of groups in influencing composting behaviour strengthens the argument that social norms, rather than just how-to knowledge, may be the key mechanism by which composting is increased in the shopping centre community. The statistics suggest that a group of individuals who are eating together are more likely to be influenced by the presence of models than a single diner is. This may be because when a group member follows the lead of the models, the whole group is likely to conform due to group conformity processes.

Mistakes. A few diners who did not compost appropriately, committed a "composting mistake," which was recorded when a non-compostable item, such as a plastic cup, was placed in the compost bin. These mistakes are an important concern for composting facilities because they result in contamination of the compost, and they can damage the composting equipment. Although low rates of composting would undesirable, contaminated compost would render the bin useless – all the waste would have to be disposed of with other garbage

in the landfill. I was encouraged to find that only 31 diners (of 547) made mistakes. This demonstrates that composting may be feasible for food courts and fast food restaurants that wish to implement it.

Interviews. All diners who were interviewed (n = 106) had been observed approaching the disposal area with clearly compostable items on their trays just prior to the interview. Diners who were interviewed provided some reasons why they did or did not compost. Only two of the diners that composted appropriately (out of 32) offered an explanation as to why, and both had to do with pro-environmental attitudes. Of note, two of the 74 individuals who *did not* compost appropriately also made comments indicating a pro-environmental attitude. The reason that a diner may or may not have mentioned pro-environmental attitudes may have had as much to do with social desirability (the desire to appear good to others) as with actual pro-environmental values or attitudes. Unfortunately, it was not possible to administer a measure of pro-environmental attitudes in the time allowed for interviews.

The most common reason given for not composting was a lack of understanding of what should be composted. It is possible that, with time and further experience, this barrier to composting will be reduced. No comments were made which suggested that the signs or models were responsible for appropriate composting, but this was demonstrated statistically. Perhaps the influence of signs or models occurred at a subconscious level, as other subtle effects have been shown to occur (e.g., Williams & Bargh, 2008).

In 32 interviewed cases, observers saw participants watching the models composting (while talking about it), and then decide to throw all their waste (including compostable waste) in the garbage bin. When asked why they did so during the follow-up interview, the

most common answer was, “I didn’t notice the bin until after I had thrown away all my garbage.” Nineteen others claimed not to notice the bin at all. Noticeability could be improved for future studies by using integrated compost bins (that have garbage, recycling and compost in the same enclosure), better signage, increased advertising, and more bins. It is also possible that salience of the bins would improve with increased exposure to them (in a longer term study).

Although the interview responses provided interesting information, the utility of the information is limited. There is likely to be some truthfulness to the answer - for example, many diners were observed carefully reading the sign above the bin only after they disposed of their waste – but there was also an unavoidable social desirability bias. Respondents were highly disinclined to provide answers which made them appear “anti-environmental.” In fact, only three diners gave answers such as “I didn’t bother” or “I wasn’t thinking,” and none indicated that they did not believe composting was important. Given the time and man-power constraints, it was not possible to construct a situation in which social desirability could be minimized.

Room for improvement. Results from the current study suggest that modeling composting in front of others improved rates from 22% to 36% (overall). Although, this improvement was significant, 64% of diners still did not separate their waste appropriately. Several barriers may account for why a large proportion of diners did not compost appropriately even after seeing others do so (Gifford, 2008). Based on the results of my interviews, previous literature and anecdotal observations, it appears that there were several barriers at work. Diners may have had a lack of knowledge of what could be composted, they may have experienced environmental numbness in that they failed to notice the compost bin,

they may have experienced conflicting goals of wanting to separate their waste and also wanting to leave as quickly as possible, and they may have been behaving within a well-developed habit that was difficult to break (throwing all waste in the garbage bin). Determining the influence of each barrier on composting could be the subject of future study in this area.

Limitations

The current study provided good evidence that, even within a non-lab natural community setting, modeling a pro-environmental behaviour can encourage that behaviour in others. Because of the design and setting of the study, it has high external validity and can be applied to multiple contexts. However, conducting this study in the field instead of a controlled lab necessarily meant that some limitations would exist.

Length. The study was short with no follow-up. The decision to conduct the study for one day with no follow up was made in order to assure the independence of observations, to reduce costs, and to make it easier to recruit study locations. Unfortunately, this also meant that I could not determine whether modeling had a lasting effect on behaviour, or whether a composting norm would eventually develop.

Varying sign placement. Although I originally planned to systematically vary sign placement among tables in the restaurants throughout the day, I was unable to do so because there was rarely a time at which all the tables were free of diners. Without this variation in sign placement throughout the day, I could not be certain that composting rates among diners with or without signs on their tables were masked by the location of the sign.

Sign specificity regarding composting. The table-top signs employed in this study were designed to convey the injunctive norm that composting is a positive way to improve

the state of environment. However, the messages on the signs focused primarily on the amount of waste that is generated and the importance of minimizing it rather than the usefulness of composting per se. Therefore, it is possible that the signs did not affect composting rates because diners did not associate the message directly with the act of composting. Possibly, a more specific sign would have been more effective for encouraging composting.

Non-random assignment. Importantly, participants in the study were not randomly assigned to conditions. Signs were placed only in areas that could be monitored by the observer (see Figures 3-6) and models could not demonstrate appropriate composting to diners who left too quickly. In the shopping malls, this meant that diners in the sign condition may have been (but not necessarily) more likely to have food and waste from the restaurants closest to the signed area. In Hillside, these restaurants were A&W, New York Fries, Julius DQ, and Villages Pizza, while in Mayfair they were KFC, Famous Wok, Opa!, and A&W. It is possible that these restaurants had more or less compostable packaging than other restaurants, and this may have affected rates of appropriate composting. At the Beacon Drive In, all of the signs were on the patio and, although part of it was heated, sitting inside was still usually more comfortable (temperature-wise) than outside. Hence, those people that were sitting outside and were exposed to the signs may have liked the outdoors more than the others. Given that enjoyment of nature is one aspect of pro-environmental attitudes (Milfont & Duckitt, 2004), diners on the patio may have been more inclined to compost.

Restaurant patrons that approached the waste disposal area very quickly were difficult to model appropriate composting for. Hypothetically, diners who were in a hurry to leave may have been particularly unlikely to respond to modeling because they were more focused

on leaving quickly than behaving pro-environmentally. If this were the case and generally diners who were not in a big rush to leave were exposed to the models, then the number of diners that responded to the models may have been artificially high.

Non-random interviews. Interviews of participants in the study were also not conducted randomly. Although they share similar rates of appropriate composting and were generally sampled representatively from each condition, they were not a representative sample of the overall group of participants because they were not approached for interview completely at random. Instead, diners were interviewed only when there were extra volunteers. With only 19% of non-random diners participating in interviews, the results should be interpolated to the rest of the sample with caution.

Blindness. Ideally, studies involving the observation and coding of behaviour should be conducted by observers that are unaware of the condition to which the participants are assigned. When researchers are aware which experimental group participants belong to, they can be influenced by this knowledge and become more likely to find results consistent with their expectations (e.g., R. W. Johnson & Adair, 1970). Unfortunately, observer blindness was impossible to achieve in the context of the current study and, therefore, results may have been biased by the observer's expectations. Observer expectancy effects may have been limited by observer knowledge of the effect (Langlois & Prestholdt, 1977), but perhaps not completely.

Uneven distributions between conditions. In each of the three locations, approximately 50% of all observations were of diners in the "No Models and No Sign" condition, and only 8% to 18% were in either of the two sign conditions. This was possibly because only a limited number of signs could be monitored by a single observer and many

people from other areas of the eateries used the compost bin. Consequently, many diners who were not exposed to the table-top signs still used the observed waste disposal area. As a result, some cells in the contingency tables (sign conditions) contained only 17 or 18 observations and the "No Models and No sign" cell contained as many as four times that number. Although the frequency of observations was sufficient to conduct the log-linear analyses, it is important to note that in several cases even the addition of two or three observations could have substantially altered observed percentages.

Removal of bin and future initiatives. Over the course of the day in which this study was conducted some diners learned to sort their compostable and non-compostable waste after eating. Given that the compost bin was only installed in each location for one day, these diners may have experienced some reactance at having to "un-learn" their compost separation behaviour. Therefore, fearing this could happen again, they may be hesitant to adopt composting or any other new pro-environmental behaviour in the future.

Implications

Social. The current study supports previous research suggesting that observing others' behaviour makes that behaviour more likely to be performed (e.g., Ferrari & Chan, 1991; Guéguen, 2007). The social implications of this finding are that one way to perpetuate pro-environmental behaviours is to simply do them and talk about them whenever possible. As the current study shows, this may be an effective method of increasing the saliency of a descriptive norm that says "everyone is doing it." It appears that leading by example is an effective strategy for behaviour change in others.

Using Rogers' (2003) diffusion of innovations model, one may liken the first composters who lead by example as innovators or early adopters. Although their behaviour

may be considered abnormal or unusual at first, after reaching a critical mass the group becomes influential enough to convince the early majority, late majority and ultimately laggards to adopt the behaviour. Such was the case in cities like Toronto where 90% of households now participate in a curbside compost collection program, diverting 100,000 tonnes of compost each year (City of Toronto, 2006).

Business. With only 4% to 8% of restaurant patrons committing "composting mistakes," it appears that compost bins in public eateries would be a feasible way to collect useful compost that is free from contamination. Since 14% to 44% of diners at each study location composted appropriately in the absence of signs or models after seeing the bin only once, there would also be a clear benefit to the environment from such a program. A simple and clear report, based on the results of the current study, and with specific information about how to implement a compost program, has been prepared for presentation to management at each of the three study locations (see Appendix 1).

Future Directions

Modeling for future studies. This study appears to support modeling social norms as an effective means to encourage pro-environmental behaviour. As demonstrated by my literature review in the introduction of this paper, such studies were more common in the 1970s and early 1980s, but far less frequent over the past 20 years. The results of the present study suggest that perhaps future studies should continue to employ this method, and identify factors that make it more or less effective. For example, does the gender of the models interact with the gender of the participant to affect behaviour? Does the complexity of the behaviour affect the adoption rate? And can a culture of sustainability actually develop as a result of implementing this procedure?

Structural solutions. Knowing that modeling a behaviour can encourage it in others is important for supporting *individuals* in "doing the right thing." But it does not provide businesses or government with clear policy initiatives that they can use to increase composting (other than designing an information campaign to disseminate this finding). A business, for example, is unlikely to pay individuals to sit in their eating area and model appropriate composting behaviour for customers. The results of this study do not provide policy makers with an effective procedure for encouraging composting. Instead, a structural solution is more along the lines of what they are likely to be are looking for. One such solution, which Hillside Mall is interested in, involves the re-design of multi-purpose bins (compost, garbage, and recycling) in order to promote proper trash separation. Previous research has reported that decorated garbage bins and ashtrays are more frequently used than their ordinary counterparts (Cope, Huffman, Allred, & Grossnickle, 1993; O'Neill, Blanck, & Joyner, 1980), and whether this is true for compost bins in public eateries should be investigated.

Along the same lines, future research on structural solutions to improve the rates of customer composting in restaurants could focus on their motivation for engaging (or not engaging) in the behaviour. Just as slowing the doors of an elevator reduced its convenience and desirability to the point where the stairs became an appealing alternative (Van Houten et al., 1981), reducing the convenience of trash disposal may increase the desirability of composting. In the current study, customers who approached the waste disposal area could (a) carefully separate all their waste appropriately (including possibly removing lids from cups or scraping food into one bin and not the other), or (b) simply dump everything into the garbage and leave quickly. In some cases, customers may have been motivated more by

convenience than by the desire to act pro-environmentally. Convenience is an important determinant of other pro-environmental behaviours such as recycling as well (e.g., Domina & Koch, 2002). If the pro-environmental behavioural alternative were also the more convenient and desirable alternative, then further compliance may attained. Future studies could investigate whether bins that are designed to discourage the use of the garbage receptacle and encourage the use of the composter are better than the ordinary ones employed in the current study. For example, an alternative bin might have a garbage portion with a smaller hole and a sign above it that reads: "non recyclable plastic, foil wrappers and Styrofoam only" with an unhappy face; the same bin could also have a compost portion that is designed to look like a large smiling face and a sign above that says "Thank you for composting! You are helping save the environment!"

Another type of structural solution may also involve delivering composting information in multiple forms, such as a small flyer or tray liner that is provided with the food. This flyer could have information about the benefits of composting and where it can be done within the establishment. A previous study has reported that showing restaurant patrons a menu in multiple forms can reduce ordering time and errors (Foster et al., 1988). Structural solutions could help provide the initial push necessary to increase composting among diners to the point where it can become the social norm.

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Appendix 1 – Report for Beacon Drive In

Dear Janet Reynolds,

Thank you very much for allowing us to conduct our study on composting at the Beacon Drive In! Your role in this study was invaluable, and allowed us to gain further insight into the effects of social norms on composting by food court patrons. As an applied psychology graduate student, my goal was to determine whether signs and/or models are useful, as well as to help implement practical solutions to environmental problems.

What we found

We put a compost bin next to your garbage can on the patio and watched it for two days. Despite this being only the first time that patrons saw this bin, a staggering **48% of them composted correctly**, and only 8% treated the bin as another garbage can (throwing away non-compostable items – which would be a problem for composting facilities). Although this is a higher percentage than at either shopping mall locations where the study was conducted, we expect the number of customers who compost to increase even further with increased exposure to the bin. Indeed, many diners carefully read the sign above the compost bin *only after disposing of their food*, and admitted in brief interviews afterwards that they "didn't notice the bin until after throwing everything out" – likely meaning that *they would use the bin the next time* they had an opportunity. Similarly, several patrons who saw the bin for the first time told us that they did not use it because they were unsure as to what could go into it. Both problems may be reduced if patrons had additional opportunities to use the bin, and observe others using it as well. One of the most important findings for us, as environmental psychology students, was that the models we employed to demonstrate behaviour were effective in increasing proper composting from 43% (no models) to 57% (with models). This effect almost reached statistical significance at the Beacon Drive In and was clearly significant at the other two study locations: Hillside and Mayfair Centres (see Appendix for greater detail).

Greening your restaurant

It is clear from your commitment to this project that the Beacon Drive In is interested in a green future and sustainable business practices. Based on data collected in your facility, it appears that a customer-based composting program **would be feasible and very effective**. Most garbage in your restaurant is already compostable (using an industrial composter), and very few people contaminate the compost by throwing away non-compostable items. Simply placing a compost bin next to each garbage can would right-away reduce the amount of consumer waste going to the landfill by **43%,** a much higher percentage than at any other study location. With a more integrated and well-designed set of bins this number could be drastically increased. If you are interested in beginning a compost program, I encourage you

to contact Jason at **reFUSE**, the composting company responsible for services at the University of Victoria and for this project (www.refuse.ca, 250-883-6467, info@reFUSE.ca). Compost could be collected on a daily basis at a reasonable cost - just like garbage. Should you decide to start a composting program with a single bin, we would be happy to donate our custom-built bin (worth $350) to you free of charge. In addition, I would offer my consulting services for design and creation of a new integrated garbage/recycling/composting program if you would like to undertake a larger project.

While instituting a composting program would be an excellent initiative, there are other simple steps that can be taken right away. Essentially, the goal for restaurant waste is to (1) produce less of it, and (2) only use items that can be recycled or biodegraded. Our observations suggest that much of the waste thrown away by diners is packaging or containers. Some of these items such as plastic cutlery, Styrofoam containers and cups, foil wrappers, plastic cups, plastic straws and plastic lids will *never biodegrade*. Ideally, all utensils and packaging would be washed and reused, but this is not possible with all items for various reasons.

Try reducing your Styrofoam and plastic use. Given that plastic cutlery can be replaced with bamboo cutlery or (nearly identical) corn starch cutlery, plastic lids and cups can be replaced with corn starch cups and lids, paper/cardboard can be substituted for Styrofoam, and foil wrappers can be replaced with wax paper, biodegradable alternatives can be easily substituted for most items. Employing an industrial compost facility in conjunction with these alternative tablewares would allow biodegradation of almost everything that Beacon Drive In customers throw away - putting the Beacon Drive In at the forefront of sustainability in waste management. Very little would go to the landfill, where *biodegradation cannot occur*. Biodegradable tableware can be purchased locally through Sysco Canada or Biodegradable Solutions Inc at competitive prices (http://www.biodegradablesolutions.com/index.php). Another good resource for eateries attempting to "go green" is the Green Table, which offers certification to participating clients; see http://greentable.net/home/ for more resources and information. All of these companies have websites that can be easily found using Google.

Well done!

We truly appreciate your participation in this research. Without you, these important findings could not have been discovered. You've done well so far, and it is our hope that you continue to improve sustainability practices at the Beacon Drive In.

Thank You,

Reuven Sussman
MSc Candidate, Psychology Department, University of Victoria

Results - Details

One hundred and fifty four observations were recorded at the Beacon Drive In over two days. Fifty percent of diners were male, 33% had a sign on their table encouraging the general practice of composting, and 38% were exposed to the models. Overall, 48% of all observed diners composted correctly at the Beacon Drive In. Customers composted correctly more often after observing the models than after not having observed them, although this difference was not statistically significant. Notably, the percentage of customers who composted was much higher at the Beacon Drive In than at either of the two mall locations, even without the models. Therefore, a compost bin in this location would be highly effective. Signs had little effect on composting behaviour, either on their own or in combination with the models.

	No Model	Model
Mayfair*	14/93 (15%)	23/83 (28%)
Hillside*	23/169 (14%)	16/58 (28%)
Beacon	41/96 (43%)	33/58 (57%)

Percentage of diners who composted correctly in the "models" and "no models" conditions

Note. *Rates of composting correctly were significantly different between "model" and "no model conditions" for these eateries

Appendix 2 – Raw Data

Data Coding

Location	1=Beacon Drive In, 2=Hillside, 3=Mayfair
BeaconStudyDay1or2	Beacon drive in location only - was diner observed on first or second day of observation
ParticipantID	Participant's ID - Unique for each day of study
SignYN	0=No, 1=Yes
ModelsYN	0=No, 1=Yes
CompostCorrectlyYN	0=No, 1=Yes
CompostCategory	1=Ideal Composting, 2=Non-ideal Composting, 3=Mistake
Gender	1=Male, 2=Female
ModelPairs	1=Angel&Lindsay, 2=Christine&Janet, 3=Ali&Aubrey, 4=Matt&Kiyuri, 5=Jill&Kim, 6=Sandra&Sonya, 7=Kimberly&Friend, 9=J&M, 10=S&J, 11=customer model, 12=Reuven, 13=Christine&Jordan, 14=Jim&Ali, 15=Matt&Ildi, 16=unknown
ParticipantgroupID	Hillside and Mayfair locations only - Group number identifying group to which diner belonged (blank if diner ate by him/herself)
RefusedInterview	0=No, 1=Yes, 2=Not Approached
NoticedBin	0=No, 1=Yes
ClaimedToUseBin	0=No, 1=Yes
CustomerComments	Transcription of customer comments from interview
NoticedSign	0=No, 1=Yes
FiguredOutStudy	0=No, 1=Yes

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
1	1	1	0	0	1	1	2			2					
1	1	2	1	0	0	2	1			2					
1	1	3	1	1	0	2	1	1		2					
1	1	4	1	0	0	3	2			2					
1	1	5	1	0	1	1	2			2					
1	1	6	0	0	0	2	1			2					
1	1	7	0	0	1	1	2			2					
1	1	8	0	0	1	1	2			2					
1	1	9	1	0	0	2	1			2					
1	1	10	1	1	1	1	1	1		2					
1	1	11	1	0	1	1	1			2					
1	1	12	1	0	1	1	2			2					
1	1	13	1	0	0	3	1			2					
1	1	14	0	0	0	2	1			2					
1	1	15	0	0	0	2	1			2					
1	1	16	1	1	0	3	2	2		2					
1	1	17	1	0	1	1	1			2					
1	1	18	0	0	1	1	1			2					
1	1	19	0	0	1	1	2			2					
1	1	20	1	1	1	1	1	3		2					
1	1	21	1	1	0	2	2	3		2					
1	1	22	0	0	1	1	2			2					
1	1	23	0	1	1	1	1	3		2					
1	1	24	0	1	0	2	2	3		2					
1	1	25	0	1	1	1	2	3		2					
1	1	26	0	1	0	3		3		2					
1	1	27	0	1	1	1	2	3		2					
1	1	28	0	1	1	1	2	3		2					
1	1	29	0	1	1	1	2	3		2					
1	1	30	1	1	1	1	1	3		2					
1	1	31	0	0	1	1	2			2					
1	1	32	1	1	0	2	2	3		2					
1	1	33	0	0	0	2	2			2					
1	1	34	0	0	1	1	2			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
1	1	35	0	0	0	2	1			0	0	0	No but I just put the same stuff in the garbage	0	0
1	1	36	0	0	1	1	1			2					
1	1	37	0	0	0	2	2			0	0	0		0	0
1	1	38	0	1	0	2	2	4		2					
1	1	39	0	0	0	2	1			2					
1	1	40	0	0	1	1	2			2					
1	1	41	0	1	1	1	2	5		0	0	0		0	0
1	1	42	0	1	1	1	2	5		0	1	1		0	0
1	1	43	0	1	1	1	2	5		0	1	1		0	0
1	1	44	0	1	1	1	1	5		0	1	1		0	0
1	1	45	0	0	0	2	1			2					
1	1	46	0	0	1	1	1			2					
1	1	47	0	1	1	1	2	6		0	1	1		1	0
1	1	48	1	0	0	2	1			0	0	0		1	0
1	1	49	0	0	0	2	1			0	0	0		0	0
1	1	50	0	0	1	1	2			0	0	0		0	0
1	1	51	1	0	0	2	1			2					
1	1	52	1	0	1	1	2			0	0	0		1	0
1	1	53	1	0	1	1	2			0	0	0		0	0
1	1	54	0	0	0	2	1			2					
1	1	55	0	0	1	1	2			2					
1	1	56	1	1	1	1	2	6		0	1	1		1	0
1	1	57	1	1	1	1	1	6		2					
1	1	58	0	0	1	1	1			2					
1	1	59	1	1	1	1	1	6		2					
1	1	60	0	0	1	1	1			2					
1	1	61	1	1	0	3	1	6		2					
1	1	62	1	1	0	3	2	6		2					
1	2	1	0	0	0	2	1			2					
1	2	2	0	0	0	2	1			2					
1	2	3	0	0	0	2	1			2					
1	2	4	1	0	0	2	1			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
1	2	5	0	1	0	2	1	7		0	1	0	Noticed after throwing stuff away	0	0
1	2	6	0	1	1	1	2	7		0	1	1		0	0
1	2	7	0	1	1	1	2	11		2					
1	2	8	1	0	0	2	1			2					
1	2	9	1	0	0	3	1			0	1	0	Did not think he had anything to compost	1	0
1	2	10	0	0	1	1	2			2					
1	2	11	0	0	0	2	2			2					
1	2	12	0	0	0	2	2			2					
1	2	13	0	0	0	2	1			0	1	0	Did not know what to put in	0	0
1	2	14	0	0	1	1	2			0	1	1		0	0
1	2	15	0	0	0	2	1			2					
1	2	16	0	0	0	2	2			2					
1	2	17	0	1	1	1	1	3		0	1	1		1	1
1	2	18	0	1	1	1	2	3		0	1	1		1	0
1	2	19	1	0	1	1	2			0	1	1		1	0
1	2	20	1	0	1	1	1			2					
1	2	21	1	0	1	1	2			2					
1	2	22	1	0	1	1	2			2					
1	2	23	0	0	0	2	2			2					
1	2	24	0	0	0	2	2			2					
1	2	25	0	0	0	2	2			2					
1	2	26	0	0	0	2	1			2					
1	2	27	0	0	0	3	1			2					
1	2	28	0	0	0	2	1			2					
1	2	29	0	0	1	1	2			2					
1	2	30	1	0	0	2	2			2					
1	2	31	0	0	0	2	1			2					
1	2	32	0	0	0	2	2			2					
1	2	33	0	0	0	2	1			2					
1	2	34	0	0	0	2	1			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
1	2	35	0	1	0	2	1	3		2					
1	2	36	1	0	0	2	1			2					
1	2	37	1	0	0	2	1			2					
1	2	38	0	0	0	2	1			0	0	0		0	0
1	2	39	1	0	0	3	1			0	1	1		1	0
1	2	40	0	1	0	2	1	3		2					
1	2	41	0	1	0	2	2	3		2					
1	2	42	0	0	1	1	2			2					
1	2	43	0	0	0	2	2			2					
1	2	44	0	0	0	2	2			2					
1	2	45	1	1	1	1	1	3		2					
1	2	46	1	1	1	1	1	3		0	1	1		1	0
1	2	47	0	0	1	1	2			2					
1	2	48	1	0	0	3	1			2					
1	2	49	1	1	0	2	1	9		1					
1	2	50	1	1	1	1	2	9		2					
1	2	51	1	1	1	1	2	9		2					
1	2	52	1	0	0	2	2			2					
1	2	53	0	1	1	1	1	9		2					
1	2	54	1	1	0	2	2	9		2					
1	2	55	0	0	0	2	1			2					
1	2	56	0	1	0	2	2	9		2					
1	2	57	0	1	0	2	2	9		2					
1	2	58	0	0	0	2	2			2					
1	2	59	0	0	1	1	2			2					
1	2	60	0	0	0	3	2			2					
1	2	61	0	0	1	1	1			2					
1	2	62	0	0	0	2	2			2					
1	2	63	0	0	1	1	1			2					
1	2	64	0	1	0	2	1	9		2					
1	2	65	0	1	1	1	2	9		2					
1	2	66	0	1	0	2	2	9		2					
1	2	67	1	1	0	2	2	9		2					
1	2	68	1	1	0	2	2	9		2					
1	2	69	0	0	0	2	2			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
1	2	70	0	0	1	1	1			2					
1	2	71	0	0	0	2	2			1					
1	2	72	1	1	0	2	2	10		0	0	0		1	0
1	2	73	0	0	0	3	1			2					
1	2	74	0	0	1	1	1			2					
1	2	75	0	0	1	1	1			2					
1	2	76	1	1	1	1	1	10		0	1	1		1	0
1	2	77	1	1	0	2	1	10		2					
1	2	78	1	1	1	1	2	10		0	1	1		1	0
1	2	79	0	1	0	2	1	12		2					
1	2	80	0	0	1	1	1			2					
1	2	81	1	0	0	2	2			2					
1	2	82	0	1	1	1	2	10		2					
1	2	83	0	1	0	2	1	10		2					
1	2	84	1	0	1	1	2			2					
1	2	85	0	1	1	1	2	10		1					
1	2	86	0	1	1	1	1	10		1					
1	2	87	0	1	1	1	1	10		2					
1	2	88	0	1	1	1	1	10		2					
1	2	89	0	0	1	1	1			2					
1	2	90	0	0	1	1	1			2					
1	2	91	0	0	1	1	1			2					
1	2	92	0	0	0	2	1			2					
2		1	0	0	0	2	1			0	1			1	0
2		2	1	1	1	1	1			2					
2		3		1	1	1	1			2					
2		4		0	0	2	1			0	1	0	Customer did not think he had anything compostable	0	0
2		5	0	0	0	2	1			2					
2		6		1	0	2	2	13		0	1			0	0
2		7	0	1	0	2	2	13		0	1			1	0
2		8	0	0	0	2	2			0	1	0	Wasn't thinking	0	0

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
2		9	1	1	0	2	1	13		0	1	0	Threw out garbage before noticing bin	1	0
2		10	0	0	0	2	2			2					
2		11								2					
2		12		0	1	1	2			0	1			0	0
2		13		0	1	1	1			0	1			0	0
2		14	1	0	0	2	1			0	0	0		0	0
2		15	0	0	0	2	2			0	1	0	Never seen it before	0	0
2		16	0	0	0	2	1			2					
2		17	1	0	0	2	1			2					
2		18	0	0	1	1	2			2					
2		19	0	1	0	2	1	13		1					
2		20	0	0	0	2	1			2					
2		21	0	0	0	2	1			0	1	0	did not think he had anything compostable	0	0
2		22	0	0	1	1	2		22	2					
2		23	0	0	1	1	2		22	2					
2		24	1	1	0	2	1	13	23	2					
2		25	1	1	0	2	2	13	23	2					
2		26	1	0	0	2	2		24	0	1	0	I put my coffee cup in	1	0
2		27	1	0	1	1	1		24	0	1			1	0
2		28	1	0	0	2	1	13		2					
2		29	0	0	0	2	1			0	1	0	not sure what could go in... noticed sign on other tables, not mine	1	0
2		30	1	0	0	2	1			0	1	0	only noticed after throwing away garbage	0	0
2		31	1	0	0	2	1			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
2		32	0	0	0	3	1			2					
2		33	0	0	0	2	1			0	1	0	couldn't figure it out	0	0
2		34	0	0	0	2	2			1					
2		35	0	1	0	2	1	13		0	0	0		0	0
2		36	0	0	0	2	1			0	1	0	Only had a coffee cup... Noticed sign on other table	1	0
2		37	0	0	0	2	2			1					
2		38	1	0	0	2	2			2					
2		39	1	0	0	2	1			2					
2		40	1	0	0	2	1			2					
2		41	1	0	0	2	2			2					
2		42	1	0	0	2	1			2					
2		43	0	0	0	2	1			2					
2		44	0	0	0	2	2		41	2					
2		45	0	0	1	1	2		41	2					
2		46	0	0	0	2	2			2					
2		47	0	0	1	1	2			2					
2		48	0	0	0	2	1			2					
2		49	0	0	0	2	2			0	1	1		0	0
2		50	1	0	0	2	1			2					
2		51	0	0	0	2	2			2					
2		52								2					
2		53	0	0	0	2	1			2					
2		54	0	1	1	1	2	3	50	2					
2		55	0	1	0	2	1	3	50	2					
2		56	0	1	1	1	1	3	50	2					
2		57	0	1	0	2	1	3	50	2					
2		58	0	0	0	2	2			2					
2		59	0	0	0	2	2			2					
2		60	0	0	0	2	2			2					
2		61	0	1	0	2	2	3		2					
2		62	0	0	0	2	2			2					
2		63	0	0	0	2	2			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
2		64	1	0	0	2	2			2					
2		65	0	1	0	3	2	3		2					
2		66	0	0	1	1	2			2					
2		67	0	0	0	2	1			2					
2		68	0	0	0	2	1			2					
2		69	0	1	0	2	1	3		2					
2		70	0	0	0	2	2			2					
2		71	0	0	0	2	1			2					
2		72	0	0	0	2	1			2					
2		73	1	1	0	2	2	3		2					
2		74	0	0	0	2	1			2					
2		75	0	0	0	2	2		68	2					
2		76	0	0	0	2	2		68	2					
2		77	0	0	0	2	1			2					
2		78	0	0	0	2	2			2					
2		79	0	0	1	1	2			1					
2		80		1	0	2	1	3		0	0	0		0	0
2		81	1	0	0	2	2		73	2					
2		82	1	0	0	2	2		73	2					
2		83	0	0	0	2	2			2					
2		84								2					
2		85	0	0	0	2	2			2					
2		86	1	0	0	2	2			2					
2		87	0	0	1	1	1			2					
2		88	0	0	0	2	2			2					
2		89	0	0	1	1	2			2					
2		90	1	0	0	2	1			2					
2		91	1	0	0	2	2			2					
2		92	0	0	0	2	1			2					
2		93	0	0	0	2	2			0	1	0	Customer thought they had nothing to compost	0	0
2		94	0	0	0	2	1		85	2					
2		95	0	0	0	2	1		85	2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
2		96	0	1	0	2	2	14	86	0	1	0	thought I could not compost napkins	0	0
2		97	0	1	1	1	2	14	86	0	1	1		0	1
2		98	0	1	0	2	2	14		1					
2		99	1	0	0	2	1			2					
2		100	0	0	0	2	1			0	1	0	threw stuff away before noticing bin	0	0
2		101	0	0	0	2	2			2					
2		102	0	0	1	1	2			2					
2		103	0	0	0	2	1			2					
2		104	0	1	1	1	2	14		0	1	1		0	0
2		105	1	0	0	2	1			2					
2		106	0	1	0	3	2	14		0	1	1	noticed sign on other tables	1	0
2		107	0	0	0	2	1			2					
2		108	0	0	0	2	1			2					
2		109	0	0	0	2	2			2					
2		110	0	1	0	2	1	14		2					
2		111	1	0	0	3	2			0	1	1		1	0
2		112	1	1	0	2	1	14		2					
2		113	1	0	0	2	2			2					
2		114	0	0	0	3	2			2					
2		115	0	0	0	2	2			2					
2		116	1	1	0	2	1	14		1					
2		117	1	0	0	2	2			2					
2		118	0	0	0	2	1			2					
2		119	1	1	0	2	1	14		2					
2		120	0	0	0	2	1			2					
2		121	1	0	0	2	2			2					
2		122	0	0	1	1	2			1					
2		123	0	1	0	2	2	14		2					
2		124	0	0	0	3	2			1					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
2		125	0	0	0	2	2			2					
2		126	0	0	1	1	2			2					
2		127	1	0	0	2	2			2					
2		128	0	0	0	2	1			2					
2		129	1	0	0	2	1			0	1	1		1	0
2		130	0	0	0	2	2			2					
2		131	0	0	0	2	1			2					
2		132	0	1	0	2	2	14		2					
2		133	0	0	0	2	1			2					
2		134	0	0	0	2	2			1					
2		135	1	1	1	1	2	14	124	2					
2		136	1	1	1	1	1	14	124	2					
2		137	1	1	1	1	1	14	124	2					
2		138	0	0	0	2	1			1					
2		139	0	0	0	2	2			0	0	0		0	0
2		140	0	0	0	3	2			2					
2		141	0	0	0	3	1			2					
2		142	0	0	0	3	2			0	0	0	thought it was a garbage bin	0	0
2		143	0	0	0	2	2			2					
2		144	0	0	0	2	1			1					
2		145	0	0	0	2	1			1					
2		146	0	0	0	2	1			0	0	0		1	0
2		147	1	0	0	2	2			2					
2		148	1	0	0	2	2			2					
2		149	0	1	1	1	2	14		2					
2		150	1	0	0	2	1			2					
2		151	1	0	0	2	2			2					
2		152	0	0	1	1	1			2					
2		153	0	0	0	2	2			2					
2		154	0	0	0	3	2			2					
2		155	0	1	1	1	2	15		2					
2		156	1	0	1	1	1			2					
2		157	0	1	1	1	1	11		2					
2		158	0	0	0	2	2			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
2		159	0	0	1	1	1			2					
2		160	0	0	0	2	2			2					
2		161	1	0	0	2	1			2					
2		162	1	0	0	2	2			2					
2		163	0	0	0	2	1			2					
2		164	0	1	0	2	1	15		2					
2		165	1	0	1	1	1			2					
2		166	0	1	1	1	1	11		2					
2		167	0	0	0	2	1			2					
2		168	0	0	0	2	1			2					
2		169	1	0	0	2	2			2					
2		170	0	0	0	2	1			2					
2		171	0	0	0	2	1			2					
2		172	0	0	0	2	1			2					
2		173	0	0	0	2	2			2					
2		174	0	0	0	2	1			2					
2		175	0	1	1	1	2	15		2					
2		176	0	0	0	2	1			2					
2		177	0	0	0	2	2		164	2					
2		178	0	0	0	2	2		164	2					
2		179	0	0	0	2	1			0	0	0	wasn't looking because only had a cup	0	0
2		180	0	1	0	2	1	15		2					
2		181	0	0	0	2	2			2					
2		182	0	0	1	1	2			2					
2		183	1	0	0	2	2			2					
2		184	0	0	0	2	1			2					
2		185	0	0	0	2	2			2					
2		186	0	0	0	2	1			2					
2		187	0	0	0	2	1			2					
2		188	1	1	0	2	1	16		2					
2		189	0	0	0	2	1			2					
2		190	0	0	0	2	2			2					
2		191	0	0	0	2	2			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
2		192	0	1	0	2	2	16		2					
2		193	0	0	0	2	1			2					
2		194	1	1	0	2	2	11		2					
2		195	0	0	0	2	2			2					
2		196	0	0	0	2	2			2					
2		197	0	1	0	2	1	16		2					
2		198	0	0	1	1	2			2					
2		199	1	1	0	2	1	16	185	2					
2		200	1	1	1	1	2	16	185	2					
2		201	1	1	0	2	2	16		2					
2		202	1	0	0	2	2			2					
2		203	0	0	0	2	1			2					
2		204	0	1	0	2	2	16		2					
2		205	1	0	0	2	2			2					
2		206	0	1	0	2	2	16		2					
2		207	0	1	0	2	1	16		2					
2		208	0	1	0	2	2	16		2					
2		209	1	0	1	1	2			2					
2		210	1	1	0	2	1	16	195	0	1	0	noticed bin after throwing things away	0	0
2		211	1	1	0	2	1	16	195	0	0	0		0	0
2		212	0	0	0	2	1			2					
2		213	0	0	0	2	2			0	0	0	did not understand english well	0	0
2		214	0	0	0	2	2			2					
2		215	0	1	0	2	1	16		2					
2		216	0	1	0	2	2	16		0	1	0	noticed bin after throwing things away... "I hope they introduce composting into the mall"	1	0
2		217	0	0	0	2	1			2					
2		218	0	0	0	2	1			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
2		219	0	0	1	1	2			0	1	1	I was looking for it... "I have kids we need to save the planet"	1	0
2		220	0	1	0	2	1	16	204	0	0	0		0	0
2		221	0	1	0	2	2	16	204	0	0	0		0	0
2		222	0	0	0	2	1			2					
2		223	0	0	0	2	1			0	0	0		0	0
2		224	0	0	0	2	1			2					
2		225	0	0	0	2	1			2					
2		226	0	1	1	1	2	16		2					
2		227	0	1	0	2	2	6		0	0	0		0	0
2		228	0	0	0	2	2			2					
2		229	0	0	0	2	2			2					
2		230	0	0	0	2	1			2					
3		1								2					
3		2	1	1	0	2	1			0	0	0		1	0
3		3	0	1	0	2	2			0	0	0	saw sign on other table	1	0
3		4	1	0	0	2	2			0	0	0		0	0
3		5	1	0	0	2	2			2					
3		6	0	0	0	2	2			0	1	0	customer thought he nothing compostable "i ate all my food"	0	0
3		7	0	1	1	1	2			0	1	1		1	0
3		8	0	0	1	1	2			1					
3		9	0	0	0	2	1			0	1	0		0	0
3		10	0	1	1	1	1		1	2					
3		11	0	1	1	1	2		1	2					
3		12	0	0	0	2	1			2					
3		13	1	1	1	1	2		2	2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
3		14	1	1	0	2	2			0	1	0	customer thought he nothing compostable "i ate all my food"	1	0
3		15	1	1	1	1	2		2	0	1	1		1	0
3		16	1	1	1	1	2		2	2					
3		17	1	1	0	2	1			0	1	0	too new	1	0
3		18	0	0	0	2	1		3	2					
3		19	0	0	1	1	1		3	2					
3		20	0	0	1	1	1			2					
3		21	0	0	0	2	1			2					
3		22	0	0	0	2	1			2					
3		23	0	0	0	2	2			2					
3		24	1	1	1	1	1			0	1	1		1	0
3		25	1	1	0	2	1			2					
3		26	0	1	1	1	1			2					
3		27	0	1	0	2	1			0	1	1	I think this is an easy way to help the environment	1	1
3		28	1	0	0	2	1			2					
3		29	0	0	0	2	2			2					
3		30	0	0	0	2	1			2					
3		31	1	0	0	2	2		4	1					
3		32	1	0	0	2	2		4	1					
3		33	0	1	0	3	2			2					
3		34	0	1	1	1	2			2					
3		35	1	1	0	2	1			2					
3		36	0	0	0	2	2			0	1	0	we finished our food	1	0
3		37	0	0	0	2	2			2					
3		38	0	1	0	2	1			0	0	0	hung over	0	0
3		39	0	1	1	1	2			2					
3		40	0	1	0	2	1			0	1	0	don't know what to put in	1	0

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
3		41	0	1	0	2	2			2					
3		42	1	1	0	2	1			2					
3		43	0	0	0	2	2			2					
3		44	1	1	0	2	1			2					
3		45	1	1	0	2	1		5	2					
3		46	1	1	0	2	2		5	2					
3		47	0	1	0	2	1			2					
3		48	0	0	1	1	2			2					
3		49	0	1	0	2	2			0	1	0	garbage mixed with food ... "can't compost garbage"	1	0
3		50	0	1	0	3	2			2					
3		51		0	0	3	2			2					
3		52	0	0	0	2	1			0	1			0	0
3		53	1	1	0	2	2			2					
3		54	0	1	0	2	1	11		0	1	1		0	0
3		55	0	0	1	1	1			2					
3		56	0	1	0	2	1			0	1	0	customer thought he nothing compostable "i ate all my food"	0	0
3		57	0	0	0	2	1			2					
3		58	0	0	0	2	2			0	0	0		0	0
3		59	0	1	0	2	2			2					
3		60	0	0	1	1	2			0	1	1		1	0
3		61	0	1	1	1	2			2					
3		62	1	1	1	1	1		6	0	1	1		1	0
3		63	1	1	0	2	2		6	0	1	1		1	0
3		64	1	1	1	1	2			0	1	1		0	0
3		65	0	0	1	1	2			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
3		66	0	0	1	1	1			0	1	1	father setting example for kids... "we compost all our stuff"	0	0
3		67	1	1	0	2	2			2					
3		68	1	1	0	2	2			2					
3		69	1	0	0	2	1			2					
3		70	0	0	0	2	1			2					
3		71	0	1	1	1	2			2					
3		72	0	0	0	2	2		7	2					
3		73	0	0	0	2	2		7	2					
3		74	1	1	1	1	2			2					
3		75	1	1	1	1	2			2					
3		76	1	0	0	2	1			2					
3		77	0	0	0	2	2			2					
3		78	1	1	0	2	2			2					
3		79	1	1	0	2	2			2					
3		80	1	0	0	3	1			2					
3		81	0	0	0	2	1		8	1					
3		82	0	0	0	2	1		8	1					
3		83	0	1	0	2	1			2					
3		84	1	0	0	2	1			0	1	0	didn't bother	0	0
3		85	0	0	0	2	2			2					
3		86	1	0	0	2	2			1					
3		87	0	0	0	2	2			2					
3		88	0	1	0	2	2			2					
3		89	0	0	0	2	2			2					
3		90	0	0	0	2	1			2					
3		91	1	1	0	2	2			1					
3		92	1	1	0	2	2			2					
3		93	1	1	0	2	2			2					
3		94	0	0	0	2	2			2					
3		95	0	0	0	2	1			2					
3		96	0	1	0	2	2			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
3		97	0	1	0	2	2			2					
3		98	1	1	0	2	2			2					
3		99	1	0	0	2	2			2					
3		100	0	1	0	2	1			2					
3		101	1	1	0	2	1		9	2					
3		102	1	1	1	1	2		9	2					
3		103	1	1	1	1	2			2					
3		104	1	0	0	2	2			2					
3		105	0	0	0	2	1			2					
3		106	0	0	0	2	2			2					
3		107	0	0	0	2	2			2					
3		108	0	0	0	2	1		10	2					
3		109	0	0	0	2	2		10	2					
3		110		1	0	2	2			2					
3		111	1	1	0	3	2			2					
3		112	0	0	1	1	1			2					
3		113	1	0	0	2	2			2					
3		114	0	0	0	2	1			2					
3		115	1	1	0	2	2			0	1	0	noticed only after throwing stuff away	0	0
3		116	0	1	0	3	1			2					
3		117	0	1	0	3	1			2					
3		118		0	0	2	1			2					
3		119		0	0	2	1			2					
3		120	0	0	0	2	1			0	0	0		0	0
3		121	0	1	0	2	1			2					
3		122	1	1	0	2	1		11	0	0	0		0	0
3		123	1	1	0	2	2		11	0	0	0		0	
3		124	0	0	0	2	2			2					
3		125	1	1	0	2	2			2					
3		126	0	0	0	2	2			2					
3		127	0	0	0	2	1			0	1	0	customer did not think he had "food waste"	1	0

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
3		128	1	1	0	2	1		12	0	1	0		1	0
3		129	1	1	0	2	2		12	2					
3		130	0	1	1	1	2			2					
3		131	1	1	1	1	1			1					
3		132	0	0	0	2	1			2					
3		133	0	0	0	2	2			2					
3		134	0	1	0	3	1			2					
3		135	0	0	0	2	1			2					
3		136	0	0	1	1	2			2					
3		137	0	0	0	2	2			2					
3		138	0	0	0	2	1		13	2					
3		139	0	0	0	2	2		13	2					
3		140	0	0	1	1	1			2					
3		141	0	0	0	2	2			2					
3		142	1	1	0	2	1			2					
3		143	0	0	0	2	2			1					
3		144	0	0	0	2	2			1					
3		145	0	0	1	1	2		14	0	1	0		0	0
3		146	0	1	1	1	1	11	14	0	1	0		0	0
3		147	0	0	0	2	2			2					
3		148	0	0	1	1	1			2					
3		149	1	0	1	1	1			2					
3		150	0	0	0	2	2			0	1	0	nothing to compost	0	0
3		151	0	1	0	2	2		15	0	0	0		0	0
3		152	0	1	0	2	1		15	2					
3		153	0	1	0	2	2		15	2					
3		154	1	0	0	2	1			2					
3		155	0	1	0	2	2		16	2					
3		156	0	1	0	2	2		16	2					
3		157	0	0	0	2	1			2					
3		158	1	1	0	2	2			0	1	0	didn't realize until too late	1	0
3		159	0	1	0	2	1			2					
3		160	0	0	0	2	1			2					

CONDITION					OBSERVATION					INTERVIEW					
Location	BeaconStudyDay1or2	ParticipantID	SignYN	ModelsYN	CompostCorrectlyYN	CompostCategory	Gender	ModelPairs	ParticipantgroupID	RefusedInterview	NoticedBin	ClaimedToUseBin	CustomerComments	NoticedSign	FiguredOutStudy
3		161	0	0	0	2	1			2					
3		162	0	0	0	2	2			0	1	0	nothing compostable	1	0
3		163	1	1	0	2	2			2					
3		164	0	0	0	3	1		17	1					
3		165	1	0	0	2	1			2					
3		166	0	0	0	2	2		17	2					
3		167								2					
3		168	0	0	0	2	1			2					
3		169	0	0	0	2	1			2					
3		170	0	0	0	2	2			2					
3		171	0	0	0	2	2			2					
3		172	0	0	0	2	1			0	0	0		0	0
3		173	1	1	0	2	1			2					
3		174	0	0	0	2	2			2					
3		175	1	1	0	2	2		18	2					
3		176	1	1	1	1	2		18	2					
3		177	1	1	1	1	2		18	2					
3		178	1	0	0	2	1			2					