RE-LOCATING RECYCLING:

A CONTEXTUAL ANALYSIS OF RECYCLING BEHAVIOR IN THE USA AND GERMANY

by

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Abstract

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While recycling remains a common research topic within environmentally responsible behavior studies, it is little known how contextual factors such as physical environments, social interactions, and cultural backgrounds influence people's attitudes and behavior. This research adopts an ecological framework and conducts a mixed-method qualitative inquiry of whether and how relocation has impacts on people's ecological thinking and behavior in their everyday life. Semi-structured interviews were conducted within two groups of people: Americans who moved to Munich and Germans who moved to New York City. Interviews were conducted in participants' homes or workplaces. Pictures were taken inside the apartments, in common areas in the buildings, and recycling areas in public spaces to record recycling accessibility.

This dissertation describes and analyzes people's recycling behavior in three interrelated aspects. First, it challenges the traditional dichotomous categorization of recyclers versus non-recyclers by presenting a model of recycling orientations in multiple

dimensions: material, spatial, and temporal. Second, it investigates various contextual factors including physical, political, and social environments that influence pro-environmental attitudes and recycling behavior. The findings show that different contextual factors are connected to each other and collaboratively influence how people perceive and perform recycling as well as other pro-environmental behavior. Finally, this research examines the effects of relocation and how people change their pro-environmental attitudes and behavior over time. The results demonstrated how changes in physical, social, political, and cultural contexts altered the way people think and act towards the environment. This study explores and confirms the importance of contextual factors in people's recycling attitudinal and behavioral changes and suggests that a consistent and comprehensive environmentally friendly environment is essential to help people build a greener lifestyle.

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With a family name (Hsieh) meaning "thanks", I thought it would have been easy for me to express my gratitude since I had plenty practices throughout my life every time I introduced myself. I was wrong. Along with the countless years I spent on the dissertation, the number of people that I am thankful for has been expanding enormously and finally outgrew the shrinking capacity of my brain and overloaded my heart. Still, I know this project will not really end until I at least try to say all the "thank you!"

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Chapter One: Introduction

"*More Americans recycle than vote."* When I first came to the United States and saw this popular saying, I was really puzzled: either Americans do not vote at all (which I could hardly imagine) or people somehow falsely thought they recycle a lot (which is difficult to believe also). That was a mystery for me because many of the items I could recycle in my hometown were (actually still are) simply discarded as garbage here in New York City. Years later I realized that it was partly because I came from a small land with tens of millions of people, and in which landfill and incineration are both problematic. From that moment, I started to learn that the boundary between resources and garbage could vary from place to place and culture to culture.

A year later I had my first of many trips to Germany and was immediately amazed by the green lifestyle there: recycling bins were consistently spotted everywhere, people brought their own shopping bags to the supermarkets, and even the toilet paper was mostly made of recycled paper. I began to wonder what contributed to this collective lifestyle: is this simply a different mentality, or are there environmental and social cues that have contributed to the phenomenon? These cultural encounters were the seeds of this dissertation. In light of the theoretical scarcity of discussion of contextual factors in environmentally responsible behavior studies, this research aims at exploring the role of different contexts in the development of people's environmental awareness and recycling behavior.

1.1 Relevant Literature

In response to increasing environmental concerns in relation to human actions, there has

been abundant psychological research on pro-environmental behavior, or environmentally responsible behavior (ERB[1].) The special issue of the *Journal of Social Issues* in the year 2000 entitled "*Promoting Environmentalism*" reflects an increasing green voice in psychology. To seek solutions to environmental problems, there has been a shift from looking for purely scientific and technological fixes to understanding the impact of human actions on the environment. Scholars have begun to pay more attention to questions such as: What do people know about the nature? Why are people concerned about their environment? What motivates people to act responsibly? ERB research ranges from wildlife conservation to green purchasing, from participating in environmental groups to using energy-saving products. Among all pro-environmental behaviors, the most-studied is perhaps recycling, due to its visibility and commonness.

Most of the scholarly efforts in ERB research have been devoted to building models to explain the relationship between various psychological attributes, demographic characteristics, and a general or specific pro-environmental behavior. Factors external to the person are often marginalized as *situational* or *external*, and simply treated as a modifier of attitude-behavior connections. It is debatable whether pro-environmental behavior should be considered purely through the lens of environmental attitudes, knowledge, and socio-demographic variables. The influences of broader contexts, including the physical, social, political and cultural environments should be integrated into the studies of environmentally responsible behavior.

In the following sections, I will discuss individual and contextual factors related to

[1] These two terms are fairly equally used in psychological literatures. Both refer to human behavior that seeks to reduce harms to the natural and built world.

current discussions in recycling studies. Using the dichotomous terms *individual* and *contextual* is for convenience and in line with other psychologists. However, it does not suggest a preference to separate individuals out of context, nor reflect my perspective on this research, which will be further explained later.

1.1.1 Individual Factors

Recycling has been studied as an individual behavior in most of the psychology literature. These studies usually focus on identifying demographic characteristics of recyclers versus non-recyclers, and on investigating the psychological attributes to recycling behavior. In the former case, socio-demographic attributes are commonly adopted as predicting variables to distinguish recyclers from non-recyclers. However, these studies have not yield conclusive findings. For example, no relationship was found between household income and recycling of newspapers (Granzin & Olsen, 1991) while, in another study, it was found that recyclers had slightly higher income than non-recyclers (Gamba & Oskamp, 1994). Moreover, Vining and Ebreo (1990) found that recyclers and non-recyclers did not differ by gender, but Reschovsky and Stone (1994) reported that women were more likely to recycle (Reschovsky & Stone, 1994; Vining & Ebreo, 1990).

As for the psychological attributes, researchers have investigated recycling behavior in relation to knowledge, motivation, competence, habits, and attitudes. The core of these studies is based on an attitude-behavior model, which often searches for explanations of the gap between pro-environmental attitudes and actual behaviors. The most widely used attitude-behavior model is the Theory of Reasoned Action (TRA) (Fishbein & Ajzen,

1975) and its revision: the Theory of Planned Behavior (TPB) (Ajzen & Madden, 1986). TRA is a cognitive model that considers intention as the best predictor of behavior. It further specifies that a person's intention to perform certain behaviors is a function of his or her attitude toward that behavior and the subjective norms. Theory of Planned Behavior added a third component, perceived behavioral control into the function of behavioral intention in the model of TRA. Perceived behavioral control is defined as a person's estimation of the easiness or difficulties for him or her to perform the behavior. According to TPB, when a person's attitude and subjective norms are in favor of the behavior, and when the perceived control is strong, the stronger the person's intention will be to carry out the behavior.

While Theory of Planned Behavior has been used extensively in pro-environmental behavior studies, it has relatively weak explanation of the gap between general pro-environmental attitudes and specific environmental behavior like recycling (Bamberg, 2003; De Young, 1986) Some researchers have attempted to add new variables to the model, such as implementation intentions (Rise, Thompson, & Verplanken, 2003) and perceived moral obligation (Chu & Chiu, 2003). To some extent, these modifications indicate that the attitude-behavior model, the demographic characteristics, and the combination of the two insufficiently explained people's recycling behavior. Recently, researchers have proposed more progressive modifications and added some new frameworks, which will be discussed below.

1.1.2 Contextual Factors

Due to the dominance of individual factors in recycling studies, factors other than

personal traits and psychological attributes influencing recycling behavior have drawn little attention in recycling studies or in broader environmentally responsible behavior research. I will summarize some findings of these rather isolated studies, which I would like to name as *contextual factors*, including the discussion of convenience, information, and availability of recycling-friendly conditions (Burn, 1991; Geller, 1985; R. Katzev, Blake, & Messer, 1993) Most studies focused only on physical attributes, such the proximity and the design of recycling containers; for example, special designed (bird-head shaped) waste containers results in more recycling (Geller, Brastead, & Mann, 1980)

Some of the studies on contextual factors challenged the use of demographic variables in determining recycling behavior. In her study of 43,000 households in Canada, Berger (1997) found that socioeconomic and demographic variables did not directly influence behavior but were rather mediated by having convenient access to recycling facilities This study not only pointed out the limitation of linking socio-demographic variables such as education and income to recycling behavior, but also indicated the importance of contextual variables.

Similar to the discussion of the availability of recycling programs, environmental sociologists Dersken and Gertell used the term “social context” to describe factors other than individual attributes. They conducted a three-city comparison study that showed that even people with few environmental concerns did recycle if an appropriate recycling program was available in their area. They concluded that social context was more important than the individual’s environmental concerns (Derksen & Gartell, 1993)

However, by "social context" they referred only to the availability of a recycling program. There was little discussion about *why* people with low environmental concerns also practice recycling.

The accessibility of recycling facilities is likely to be just one of many variables that cloud the relationship between social variables and recycling practice. Also, unseen intermediate variables might vary in different countries and within different cultures such as social pressure or economic incentives.

1.1.3 New Frameworks and Models

As mentioned earlier, on the one hand, attitude-behavior models continue to be predominant in recycling studies, even though they have provided limited explanations. On the other hand, discussions of contextual factors have been scattered and marginalized. The disconnectedness of the two phenomena may be the reason for the appearance of new frameworks and models in the past few years. One example is Stewart Barr's framework of environmental behavior, which is based on but heavily modified form of Ajzen and Madden's Theory of Planned Behavior (Barr, Ford, & Gilg, 2003). Barr added a group of variables in explaining the relationship between environmental attitudes and environmental actions, which he named *situational variables*[2] functioning as composite factors that gauge the social context in which an individual is situated, his/her socio-demographic status, and the person's awareness and experience of waste management (see Figure 1 for details.) This model still centers on the attitude-behavior connection in which psychological processes and behaviors are conceptualized as

[2] This set of variables includes context, socio-demographics, knowledge and experience.

separate from the individual's context.

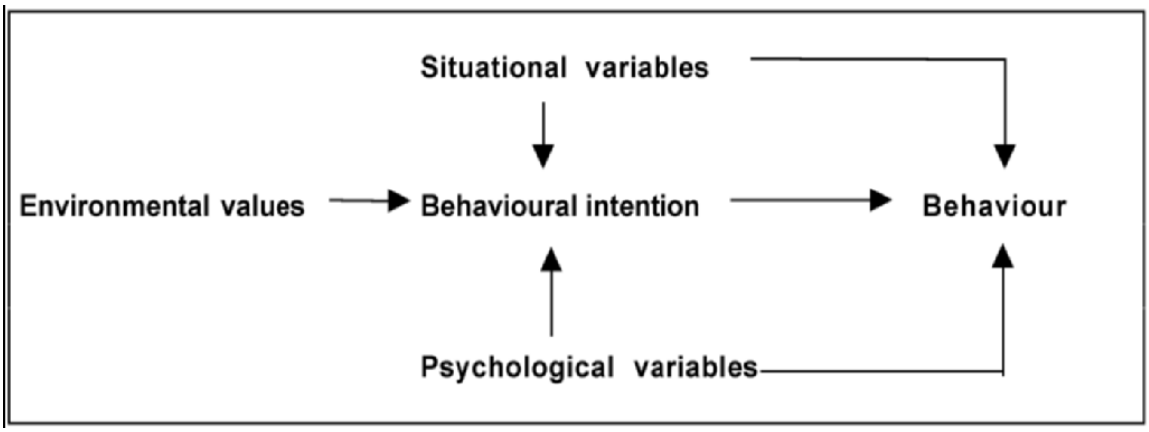

Figure 1: Conceptualization of environmental behavior (Barr et al., 2003, p. 409)

Another example is the "Social-Ecological Framework" which is rooted in Gibson's notions of affordances (Gibson, 1979) which stress the inseparability of individuals and their environments (Kurz, 2002). Kurz reviewed and critiqued four major perspectives on environmentally responsible behavior before proposing his own model. The first perspective is rational-economic model, which assumes that people's behavior is primarily determined by their financial interests, and individuals will engage in a cost-benefit analysis in their decision-making processes of the certain behavior. The main criticism of rational-economic model, as Kurz pointed out, is that people are not always rational or function in economic ways. He also noted that this model fails to appreciate the psychological and social meaning of "cost." The second perspective is the social-dilemmas model, which depicts the well-known "Tragedy of the Commons" by (Hardin, 1968) Social dilemmas deals with two conflicting sets of rationality that individuals encounter in many environmental problems: making choices leading to personal versus collective gain. Most pro-environmental studies using the

social-dilemmas approach adopted experimental method which assigned people in laboratory settings with a task of resource management that mimics real-life situation. This approach is critiqued by Kurt mainly because of the limited application of its findings to real life, as well as some problematic assumptions that consumers will eventually suffer from depleting the resources. The third perspective outlined by Kurt is attitudes models, which emphasizes the connections between environmental attitudes and pro-environmental behavior. Theory of Reasoned Action and Theory of Planned Behavior explained in an earlier section belong to this approach. Kurt asserted the major problem with attitude models is the lack of consideration of factors that are beyond individual control[3] as well as its contradictory findings. The last perspective is behavioral approach, which stems from Skinnerian tradition of behavior modification based on learning theory. Even though behavioral approach has identified many intervention techniques, they usually lack long-term effects.

After reviewing the four major perspectives in ERB studies, Kurz proposed the "social-ecological framework" (shown in Figure 2) which he adopted a transactional worldview (Altman & Rogoff, 1987; Wapner, 1987) and emphasizes the processes of people-object interactions in everyday life. The core of his social-ecological framework is to consider the psychological relationship between individuals and their physical and social environments, and environmentally-friendly behavior can be seen as results of the way that people interact with things around them in their everyday lives. For example, a dryer may afford efficient drying of clothes, but it may also afford consumption of large

[3] Even though TPB added "perceived behavioral control" into the model, it considers non-attitudinal factors merely as modifications to the attitude-behavior connections.

amounts of gas or electricity. Environmentally responsible behavior may be examined as how people attune their perceptions among multiple affordances of a given object.

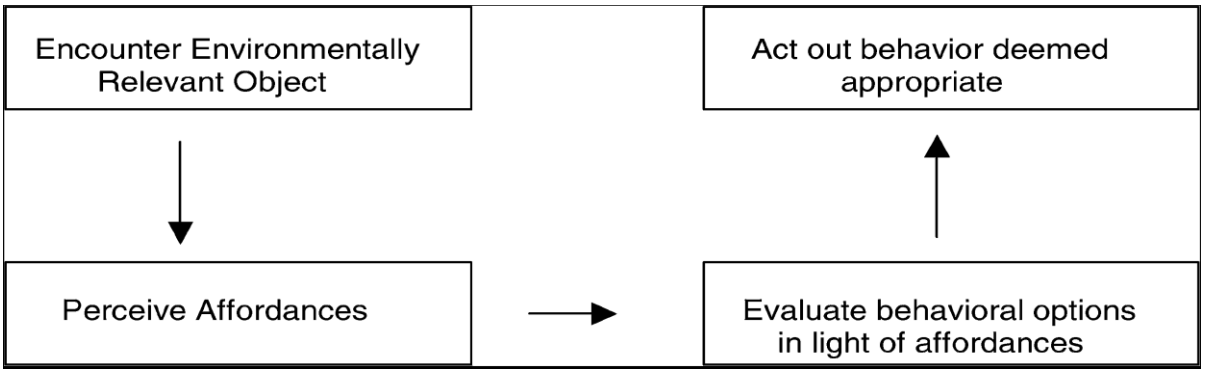

Figure 2: A model of the role of attitudes in a social-ecological framework of ESB (Kurz, 2002, p. 274)

A more inclusive model was proposed by Kollmuss & Agyeman (2002) based on their extensive reviews of theoretical frameworks for analyzing pro-environmental behavior. They proposed this framework not because they wanted to provide a better prediction or understanding of pro-environmental behavior, but to show the complexity of all possible factors. The diagram they proposed (Figure 3) basically illustrates the contribution of internal factors (such as value system, personal traits, and consciousness) and external factors (political, social and cultural factors) to pro-environmental behavior. The black boxes represent the barriers, but they did not discuss why and how those barriers work along with internal and external factors. It should be also noted that the separation of internal and external factors clearly indicated the authors' perspective that psychological processes are conceptually separate from infrastructures, political, social, and economic factors; this separation isolates internal factors, such as the development of environmental consciousness from the contexts. Even though the two arrows seem to connect between internal and external factors, the concepts and processes of these

implicit interactions are not fully developed.

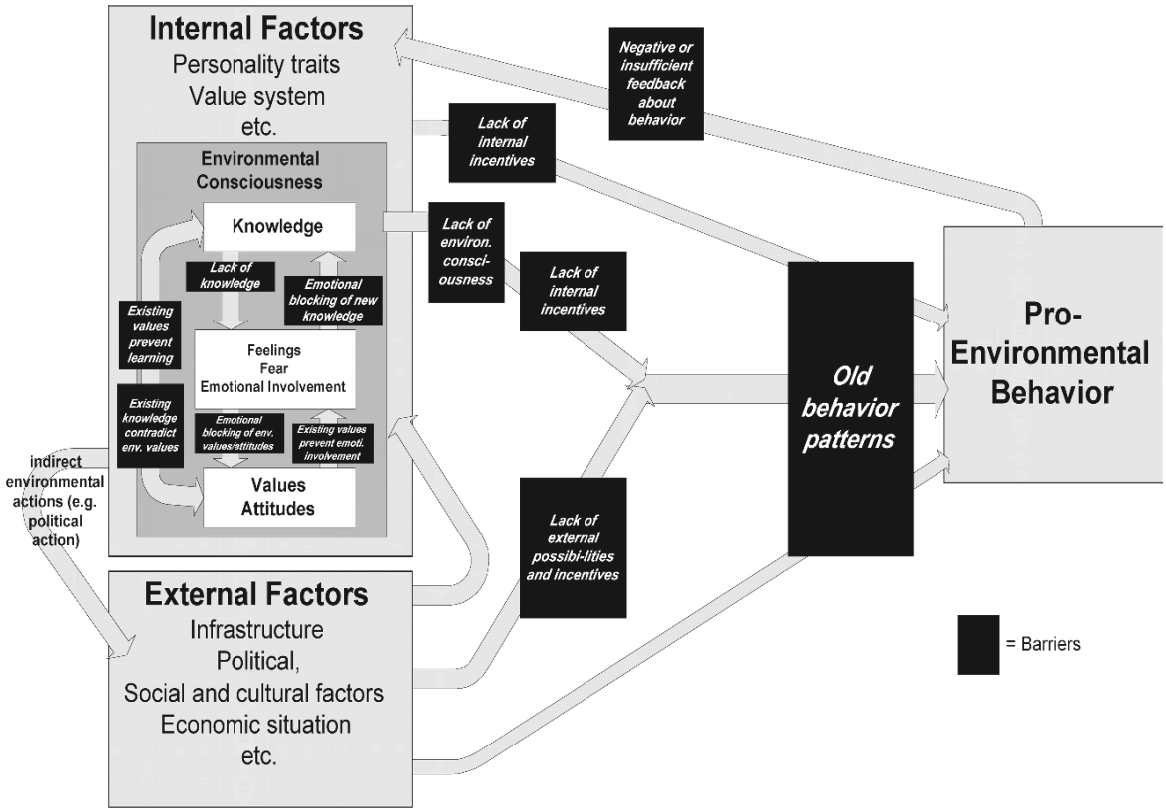

Figure 3: Model of pro-environmental behavior (Kollmuss & Agyeman, 2002, p. 257)

Finally, in an interdisciplinary effort, Reid and colleagues created a conceptual framework to bridge the macro-level and micro-level research (Reid, Sutton, & Hunter, 2010). They argued that pro-environmental behavior research has a limited understanding of social change because of dichotomous thinking: researchers mostly investigate the issue either at macro level or micro level. They proposed to shift the inquiry focus to the meso level, and suggested using household as a unit for further research. Household is suitable as a unit for studying pro-environmental behavior because, in their views, "*households incubate integrations between macro and micro levels and, importantly, that understanding those interactions can also aid the understanding of pro-environmental behavior*." (Reid *et al*., 2010, p. 320)

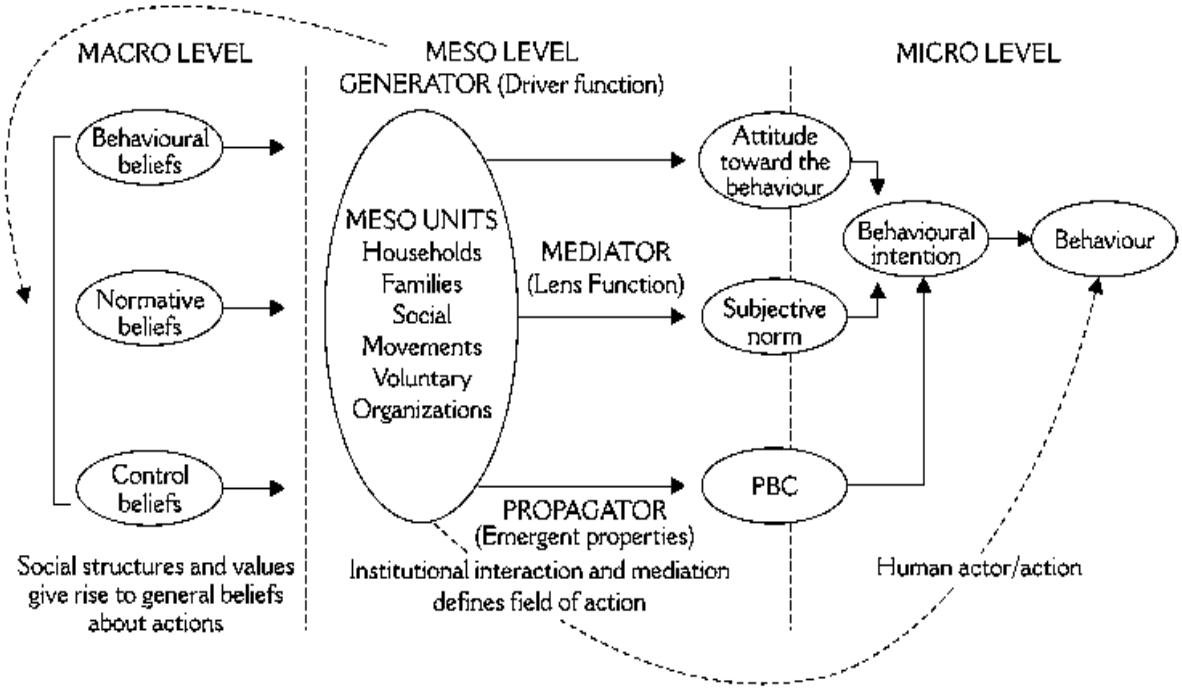

Figure 4: A conceptual framework demonstrating the importance of the meso level on pro-environmental behavior (Reid et al., 2010, p. 322)

To summarize, these new models and frameworks reflect an emerging dissatisfaction with existing attitude-behavior-centered theories as well as other approaches critiqued by Kurz. Some of these frameworks recognize the importance of the context in which an individual is placed. Yet these frameworks grew out of extensive literature review of the *status quo* rather than new empirical research. It is also worth noting that the majority of these recycling studies employed a quantitative survey approach, which allows little opportunity for discovering new ideas or building new perspectives. Moreover, the discussion of contextual factors is limited to the physical environment, such as objects and their proximity. Even when the broader context—including political, social, and economic factors—is included in Kollmuss and Agyeman's framework, they did not elaborate on the interrelationship between contextual and individual factors. The lack of

discussion of contextual factors may be due to insufficient conceptual frameworks and the absence of corresponding empirical work. It is clear that non-individual factors have recently begun to be considered in the environmentally responsible behavior literature through different new frameworks and models but a new paradigm has not emerged.

1.2 Recycling and Contextual Factors

To further emphasize the importance of considering contextual factors in environmentally responsible behavior studies, it is useful to consider only one target behavior for discussion. Since recycling has been the most-studied ERB, it will be used as an example. Unlike some pro-environmental behaviors such as conserving energy or donating to environmentalist organizations, recycling involves much more than individual efforts. Recycling, though simple at first glance, is actually a multifaceted concept that includes both behavioral and political aspects. Urban recycling has evolved from the local scrap yard to a global industry (Weinberg, Pellow, & Schnaiberg, 2000). It is further compounded by the complexities of city economics and politics (Gandy, 1994). Macro-level factors often determine what kind of recycling program exists in different places, which then create the context that affects an individual's everyday practice of recycling. As mentioned earlier, there has been little discussions in existing psychological studies of recycling of *whether, how and why* the economic, political, and cultural environments affect people's conceptualizations and practice of recycling. Research on macro-level factors is much needed.

Broader contextual factors have not been investigated may be that these factors are correlated with many other variables. The majority of recycling studies have been

conducted at a single site (school, neighborhood, or city), which allowed little or no variations in broader contextual conditions. For the very rare comparative cases, the results were usually confounded due to the sampling procedures and characteristics of the participants. For example, in Kaiser and Wilson's cross-cultural study, they found that Swiss adults are ecologically better behaved than California students, while the two groups of students within California did not differ (Kaiser & Wilson, 2000) This result may seem to provide enough evidence to demonstrate contextual or cultural differences in environmentally responsible behavior, yet the authors could not exclude the confoundedness of the basic differences in age and life circumstances of Swiss adults and California students.

1.3 Research Question: Relocation and Contextual Factors

The difficulties in appropriately addressing contextual factors may be resolved either by using comparable samples, or even more persuasively by "comparing" the same individuals in different contexts. The relocation of people from one cultural context to another offers a natural experiment for this purpose. The influence of political, cultural and economic environments on an individuals' pro-environmental thinking and behavior is difficult to detect unless the broader environment is changed. In the case of relocation, the same individuals, possessing the same *internal factors*, move to another place and encounter a number of stimuli in the new context, including physical, social, political, and cultural differences. Psychological studies on relocation indicate that the new place may provide different opportunities for individuals to develop new identities (Hormuth, 1990). However, these studies have not focused on the realm of environmental awareness or environmentally responsible behavior. Very little is known about whether and how

changes of physical and social-cultural environments contribute to one's ecological thinking and everyday behavior.

The theoretical dearth of contextual factors, along with the opportunity that relocation offers to disentangle the contextual and individual factors, leads to the formation of the following research questions:

1. How do contextual (political, cultural, social and physical) factors influence people's recycling behavior and ecological thinking?
2. How does relocation (and the related change of environmental cultures) affect people's environmental concerns? What are the factors involved in the processes?

In order to answer the research questions, my study included interviews with two groups of people about their recycling experiences after moving to another country: Americans who moved to Munich, and Germans who moved to New York City. Detailed research design and methods will be described in the next chapter.

1.4 Structure of the dissertation

The remaining chapters of the dissertation are structured as follows:

Chapter Two: Research methods and settings- two environmental cultures

This chapter details the research design and methods. It also analyzes the recycling programs in the two cities: New York City, USA and Munich, Germany. This chapter aims at giving the readers a background of the environmental contexts. Data used in this chapter include: Archives of recycling information in the two cities, various reports,

website information, and government brochures.

Chapter Three to Five

I organized results and discussions in three interrelated yet different chapters: *people* (chapter 3), *contexts* (chapter 4), and *time* (chapter 5.) Chapter 3 emerges in the data-analysis process, and problematizes the existing way of measuring recycling behavior. Chapter 4 and 5 respond to each of the two major research questions mentioned above.

Chapter Three: Beyond recycler and non-recyclers

This chapter critiques previous studies that commonly contrast recyclers with non-recyclers. The research results demonstrate a wide range of orientations to recycling attitudes and behavior, which are much more dynamic and complicated than what is suggested by the existing studies.

Chapter Four: Contextual factors of recycling

This chapter analyzes the different layers of contextual factors that influence people's environmental thoughts and behavior, including immediate physical spaces, actual and imagined social network, economic and political environments.

Chapter Five: Relocating selves

Following the discussion of contextual factors in the previous chapter, this chapter will take a closer look at the processes and aspects of pro-environmental behavior changes after people relocate to another country.

Chapter Six: Conclusions

The final chapter will comprise an overall discussion of the work presented in reflection

on existing theory and research on recycling. In addition to discussion of the overall contribution of the research to pro-environmental behavior studies, suggestions will be offered regarding policy implementations for improving public understanding and behavior.

Chapter Two: Research Methods and Settings

Environmentally responsible behaviors –especially recycling– have been studied primarily through the lens of the attitude-behavior model. Under the dominant attitude-behavior model, contextual factors for environmentally responsible behavior are marginalized and scantly discussed. Some new frameworks have been proposed, but empirical studies designed to establish new theories remain scarce. For this reason, this research was designed to investigate contextual factors by utilizing relocation for natural experiments. Research questions included: Whether and how does relocation have an impact on people's environmental thinking and concerns, as well as influence their everyday environmental practices, such as waste management? What are the contextual factors related to people's ecological thinking and recycling behavior? What elements are involved in the process? These research questions address both theoretical and methodological issues discussed earlier. In this chapter, I will introduce the research design, methods and settings—as well as some detailed background on waste recycling policies in the targeted research areas.

2.1 Research Design

2.1.1 United States vs. Germany

This study investigated the recycling attitudes and behavior of two groups of people: Germans who moved to the United States and Americans who moved to Germany. The two countries were chosen because of their markedly different cultures of environmentalism, despite the fact that both are developed, industrialized western nations

(Gandy, 1993). The different cultures are evident in a wide range of settings, from daily life to national policy. The German government implemented a series of innovative environmental policies, which have had an ongoing influence on other countries in Europe and beyond. German environmental regulations have a unique perspective, in that they do not place the sole responsibility for recycling on consumers. The most revolutionary policy is perhaps the Packing Ordinance (B. K. Fishbein & Azimi, 1994), which requires manufacturers and retailers to recycle all the packaging materials, instead of passing the responsibility to consumers. (Details of the policy will be explained later in this chapter.) In contrast, the United States is often considered a paradise of consumerism and capitalism and creates a very different milieu for recycling. One example is the two-year recycling suspension in New York City, in which an important environmental policy decision was made based on economic logic rather than environmental concerns (Hsieh, 2004) These contrasting environmental cultures, along with the different recycling policies and programs of Germany and United States, offer a "natural" laboratory to investigate people's changes after relocating to a different recycling context. Given that recycling policies vary by localities, cities were used as comparative units rather than entire countries.

2.1.2 An Ecological Approach

This research adopted an ecological approach: in contrast to experimental psychological approaches, an ecological approach considers individuals and their environments as a whole system. In other words, ecological thinking holds that the best way to understand human behavior is to consider *people-in-environment* as a unit. This approach is in line with ecological psychology theories including "environmental

affordances" (Gibson, 1979); "behavior settings[4]" (Barker, 1999; Wicker, 1987); the ecological models of Bronfenbrenner and colleagues (Bronfenbrenner & Crouter, 1983) and an organic, transactional worldview (Wapner, 1987). Affordance refers to functional properties that an object holds

An ecological approach is especially useful in studying people's transition from one place to another: it examines all elements within a system rather than accessing psychological attributes and socio-demographic characteristics solely and separately. It also emphasizes *process* rather than *fixed status*. Psychological attributes such as attitudes, knowledge, and behavior are likely to change when an individual encounters a different physical, social, and cultural environment.

In the case of recycling, moving to a new place means the possibility of changing previous consuming habits, a tendency to familiarize oneself to a foreign program; adjusting to different physical space arrangements for garbage; learning new terms, languages and symbols related to recyclables; and encountering different social expectations and cultures with regard to consumption and waste management activities. Adopting an ecological approach is essential to capture the processes of these transitions and adjustments. It also helps establish a holistic understanding of people's pro-environmental thinking and behavior in context by analyzing different elements in the system.

2.2 Research Methods

Prior to the formal research, I visited Munich eight times, each time for several

[4] A behavior setting is the basic unit of environment-behavior relationships. It is an entity that encompasses the location of a large volume of behavior; consists of the interdependency between the standing patterns of behavior and the physical milieu.

weeks over the course of five years; adding up to about seven to eight months in total. The extended experiences of being a seasonal German resident established participant observations for my research: just like my American interviewees, I carried my recycling experiences from New York City, encountered language barrier and cultural disparities. I was both puzzled and amazed by how Germans categorize waste and recycle, then gradually developed my own recycling routines.

Mixed methods were used to reflect the ecological research approach; all elements in the people-environment system were captured in a dynamic way. Research methods are described as follows:

2.2.1 Semi-structured Interviews

This research did not seek to generalize the entire Americans-in-Germany or Germans-in-America populations, but aimed for a deeper and more dynamic understanding of people's fragmented everyday life spaces in order to add their changing life experiences to the existing recycling literature. Ecological psychology provides a good perspective from which to understand people's behavior in a natural setting as opposed to a laboratory or experimental setting. Based on both the existing literature and the pilot study, this research tried to maximize the diversity of the participants based on age, length of stay in Germany or the United States and reasons for relocation—as well as achieving a gender balance.

The following criteria were determined at the beginning of the study and made clear when advertising to recruit participants:

1. Adult (at least 20 years old);

2. In charge of or sharing responsibility for garbage disposal in the household;
3. Residing in NYC/Munich for at least three months;
4. Living in a residence (rather than a hotel)

A sample of flyer for recruiting research participants is included in Appendix A.

A. Recruiting Procedure

The recruiting of participants drew upon both organizational and personal contacts. In Munich, I recruited participants through a variety of official American-related organizations and institutes, such as Amerika Haus, the Bavarian American Academy, and Amerika-Institut der Universität München—as well as unofficial, social or business groups such as AGBC (American-German Business Club). In New York City, participants were targeted via the German Academic Exchange Service (DAAD), Göthe Institute, two Meetup Groups (New York City German Speakers and New York City German Culture) to which I belong, as well as personal contacts. Some snowball sampling was used in both sites.

B. The Interview Method

The primary interview strategy included soliciting narratives from the interviewees about their life history with regard to thinking about and dealing with waste as well as how they experienced change in the context of the new culture, and what these changes led to in their thoughts, concerns, and activities with regard to waste. I then followed up on their narratives with probes designed to clarify details, invite comparisons, and to extend the discussion based on the stories they offered—with particular emphases on contextual factors.

Interviews were semi-structured. Questions included, but were not limited to: people's recycling experiences in the host country; their perception of environmental/cultural differences between their home country and the host country; and any reflections regarding their ecological identity with regard to recycling and garbage (for more detailed interview guidelines please refer to Appendix B.) With participants' consent, interviews were conducted mostly at participants' residences or work places. The *in vivo* interview approach allowed me to see the context in which they lived and the specific locations they referred to or special arrangements they made. It also provided opportunities for the participants to easily demonstrate their everyday recycling behavior.

A total of 45 interviews (with 47 participants; two couples were interviewed together) were conducted in the two sites. The average interview lasted a little over an hour. Participants moved to the host countries for various reasons, ranging from one-year study abroad programs, job requirements, marriage or partnership, to lifestyle choice. Some interviewees were already in the process of moving back; some were not sure whether or how long they would stay, while others were determined not to move back. Throughout the entire recruiting process, except for the preset criteria as described earlier, no participant who volunteered was turned down for balancing or maximizing diversity purposes. Instead, an *ad hoc* elimination was performed, which will be described below. Of the forty-five interviews, thirty-five were conducted in the respondents' homes, two in their workplace or school, and eight in other locations such as cafés and parks, per participants' requests. All interviews were conducted in English, with only a few specialized terms mentioned in German. With the participants' agreement, all interviews were digital audio recorded and then transcribed. This dissertation uses

the real names of all participants with their agreements, except one who preferred to use his pseudonym in the online forum.

C. Interviewees

Americans in Munich:

Over twenty organizations, institutes, and online forums were utilized for recruiting participants. Thirty interviews (with thirty-two people total) were conducted in Munich between June and August in 2006. Interviewees lived in both the inner city and outskirts of Munich. Interviewees aged from 21 to 67 and about two-thirds were female. Household types included singles, cohabitating couples, and families both with and without children. Among couples (both married and unmarried), some were both Americans while others were with German or other foreign partners. Length of residence in Germany ranged from ten months to forty-one years. The table below shows a summary of the basic characteristics of the interviewees in Munich.

Number of participants	33
Gender	11 male, 22 female
Age	21-67
Length of residence in Germany	< 1 year: 5
	1-5 year: 8
	6-10 year: 6
	> 10 year: 14
Recruitment	Toytown Munich: 7
	AAUPW[5]: 5
	AGBC[6]: 4
	Junior Year Munich: 2
	Snowball: 9
	Personal: 3
	Democratic Abroad: 2
	US consulate: 1

Table 1: Summary of interviewees in Munich

[5] AAUPW stands for American Association of University and Professional Women.
[6] AGBC stands for American-German Business Club.

In terms of geographic distribution, a map of the interviewees' residence is shown in Figure 5:

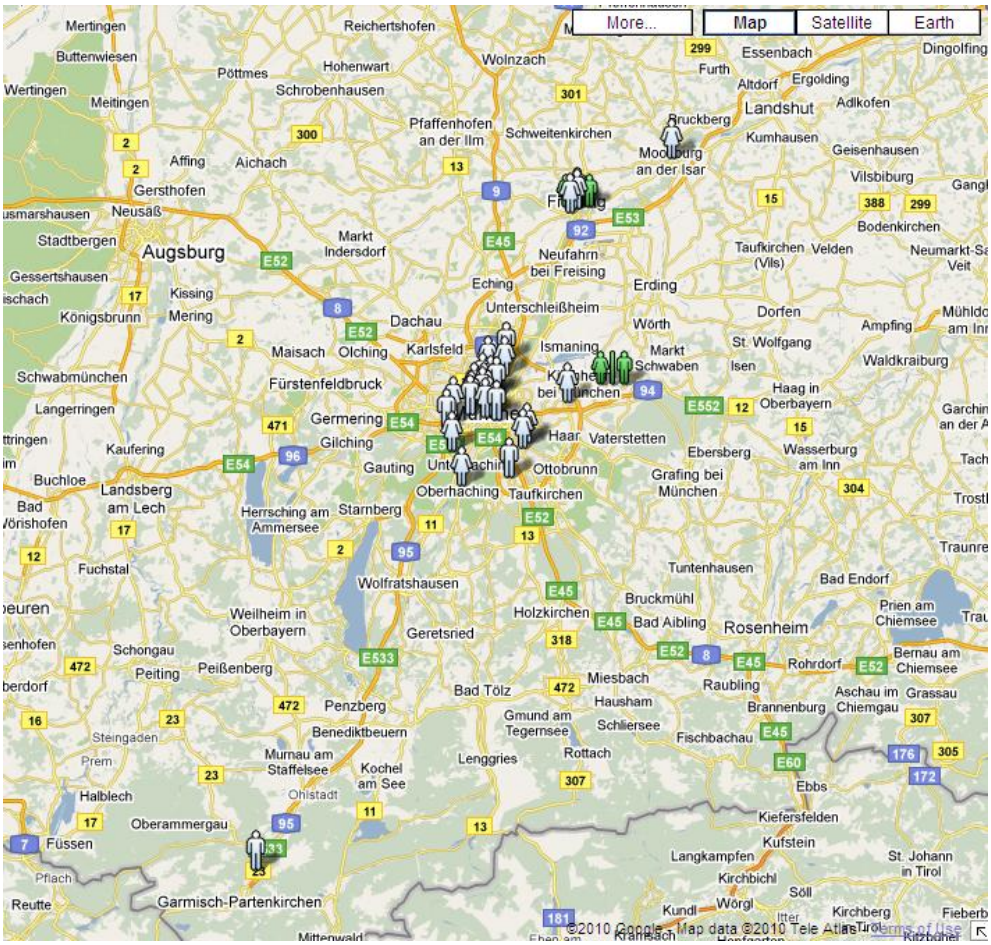

Figure 5: Interviewees' geographical distribution in Munich and surrounding areas

Germans in New York City:

Fifteen interviews were conducted with Germans in New York City between October 2007 and July 2008. As with the recruiting procedure in Munich, potentially qualified interviewees were contacted through both institutional and personal networks. Fewer interviewees were successfully recruited compared to the Munich sample. This was probably due to looser connections and networks among Germans in NYC, compared to Americans in Munich. Even though the number of participants was smaller than originally planned for, the variety and richness of the interviews were comparable to the Munich sample. Moreover, unlike in Munich where almost one-third of interviewees lived on the outskirts of Munich, only one participant did not live in New York City. Therefore, less elimination needed to be done at this site. (For details of sample eliminations, please see the immediate following section.)

Number of participants	15
Gender	8 males, 7 females
Age	21-70
Length of residence in the US	< 1 year: 2
	1-5 year: 5
	6-10 year: 2
	> 10 year: 6
Recruitment	Goethe Institute: 1
	Personal contacts: 7
	DAAD: 1
	Deutsches Haus: 1
	Snowballing: 5

Table 2: Summary of interviewees in NYC

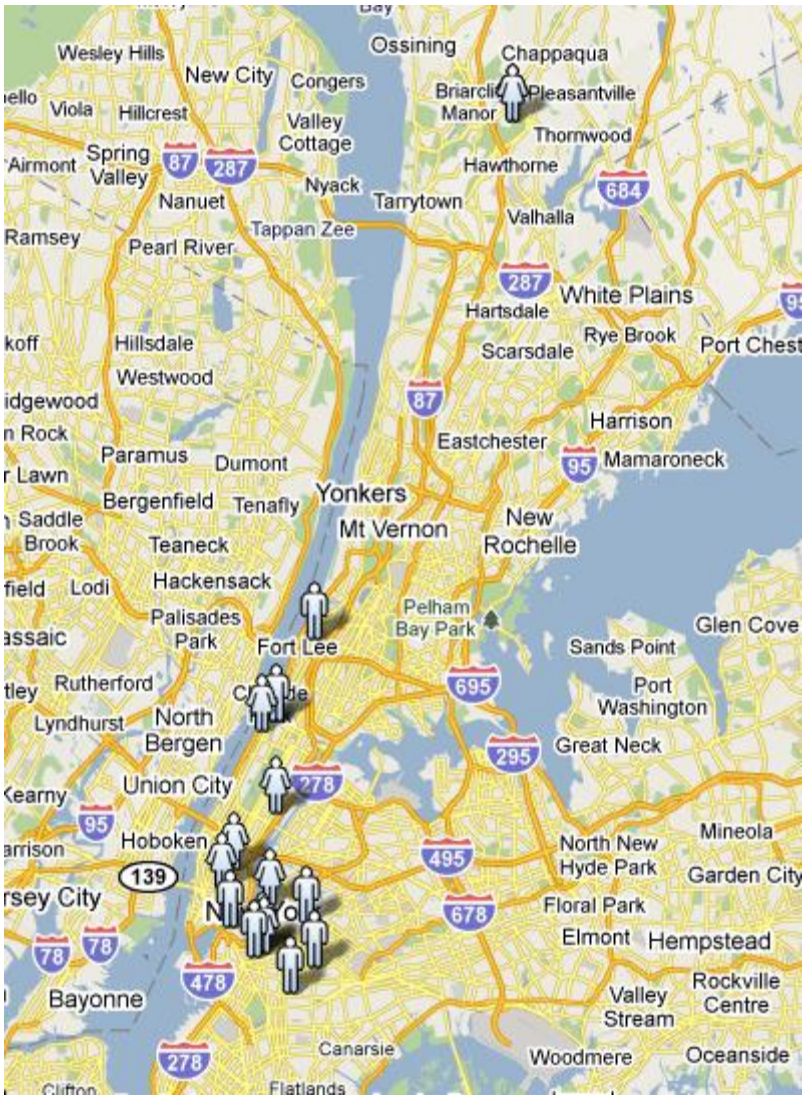

Figure 6: Interviewees' geographical distribution in New York City

D. Ad hoc Elimination of Interviewees

After transcribing all interviews and before extensive coding for further analyses, I decided to eliminate some participants for a more balanced and focused sample. Because of different difficulties in recruiting Germans and Americans in the two cities, the original sample was quite unbalanced: among 47 interviewees, 32 were Americans in Munich and 15 were Germans in New York City. The series of elimination steps is explained in detail below:

Step 1: Eliminate participants living in suburban outskirts.

Among the 32 Americans, nearly one third (10 people) lived on the outskirts of Munich, including Freising, Moosburg, Poing, and Farchant. Though their experiences generally reflected the Americans' experience living in Germany, I learned from the interviews that their recycling scenarios were somewhat different from Munich City. I decided to eliminate those people because their recycling system is different from residents in inner city. The same criterion was applied to eliminate one German interviewee in NYC.

Step 2: Eliminate participants who were interviewed outside their homes or work/study places.

As described earlier, all efforts were made to have interviews conducted in participants' homes. A few participants chose not to be interviewed at their homes, so other locations were used instead. The alternative site interviews still have value, though they are not as complete as others when it comes to seeing and evaluating the physical contexts of various environments (inside the apartment, in- and outside the building, the block and the neighborhood, etc.) In this step, four Americans in Munich and one German in NYC were eliminated.

Step 3: Eliminate participants who moved to the host country too long ago

Before the interviews, the criterion for length of residency in the host countries was set at the shorter end only. I hoped to interview only those who had resided in their host country longer than three months, in order to exclude participants who had not yet familiarized themselves with the recycling regulations and cultures, or established their

garbage-sorting routines. In the process of interviewing, it became clear that people who moved to the host country many years before had not preserved reliable memories of their relocation, learning and adjustment experiences. Moreover, in some cases the interviewees moved to the host country even before recycling was available at the municipal level. Those participants' experiences are still valuable for historical inquiry but did not make a focused contribution for the purposes of this research. This criterion eliminated four more people in Munich sample and two more in New York City.

After all eliminations, twenty-five participants were left in the sample: fourteen of them were Americans and the remaining eleven were Germans. Throughout the remaining chapters, I will focus on these twenty-six cases. A list of the 25 participants and their basic demographics is included in Appendix C.

2.2.2 Supporting materials

In addition to semi-structured interviews, supporting information was collected from the following sources:

Observations

Observations were made to provide an overview of recycling opportunities in both cities including physical objects (quantity and quality of the recycling containers in public places, for example); information about recycling, such as signs and posters; bottle refund mechanisms, etc. Photographs were taken as part of observational data.

Online forum

Toytown Munich (http://www.toytowngermany.com/munich/) is a chapter of

Toytown Germany, the largest English-speaking online community in the country. The website is for all English-speaking populations, not only Americans, though American participation represents a high percentage of the forum's activity. In addition to soliciting interviewees from the forum, I also analyzed 43 discussion threads regarding recycling.

Artifacts and archives

Archives were collected mostly in a naturalistic way in order to represent the available information for research participants. Interviewees provided me with a wide range of documents and objects including government policy brochures and flyers, community newsletters, newspaper articles, special household battery recycling boxes—and even recycling-related TV show episodes (shared as electronic files). In addition to the practical information provided by these artifacts, their quantity and quality also indicated different available resources at the two research sites. Additional materials were collected during my visits to recycling centers, municipal waste management offices and government websites.

2.3 Data Analysis

Transcribed data were thematically analyzed. Following the spirit of grounded theory, I believe that, as we investigate lesser known phenomena like the influence of contextual factors on recycling behavior, *new* research questions and analytic frameworks are likely to emerge during the process of data collection and data analysis (Glaser & Strauss, 1967). Before commencing my fieldwork, I created a list of possible codes corresponding to each research question. As the research progressed, more codes were created in order to represent new concepts or discoveries derived from observations and

interviews. When new codes were created, I went back to coded interviews for relevant quotations and attached the new codes to them. A of list codes is included in Appendix D. Coding and thematic analyses were done with the aid of the qualitative data analysis software, ATLAS.ti.

2.4 Recycling in the two cities

2.4.1 Recycling in Germany

Green Dot (Der Gruene Punkt) and the Dual System

In 1991, the German Ordinance on the Prevention of Packaging Waste ("Packaging Ordinance") was enacted[7]. The Packaging Ordinance (Verpackungsverordnung) requires manufacturers and retailers to take back all primary and secondary packaging. The main purpose of the ordinance was to reduce packaging waste and to prioritize its reuse and recycling to disposal. The DSD (Duales System Deutschland AG) system was created to meet that standard. This system represents a major breakthrough because it broadens the responsibility for recycling beyond the consumer. This shift has encouraged manufacturers to reduce unnecessary packaging materials (B. K. Fishbein & Azimi, 1994)

The Packaging Ordinance has encountered some difficulties. Criticisms of German solid waste management are not limited to its economic efficiency, but also its ecological benefits. As Staudt and Schroll demonstrate, there have been only marginal effects on the production stage of packaging and questionable effects on the recycling and disposal

[7] The ordinance classified packaging into three categories and were enacted at different times: transport (in December 1991), secondary packaging (in April 1992) and sales packaging (in January 1993.)

stage of packaging. They note an increased burden on the consumer because of an increased number of recyclable categories and that only 70% of light-weight packaging collected by DSD was recycled, and the remaining 30% included materials mistakenly put into the collected and sorting residues (Staudt & Schroll, 1999). They showed that packaging was being reduced prior to the enactment of the Packaging Ordinance and argued that, even without the packaging ordinance and dual system, similar—perhaps even better—results could be achieved through an integrated waste management system.

2.4.2 Munich's Recycling Program

Unlike the pick-up recycling system of New York City, in which residents simply put the recyclables at the curbside, Munich's recycling program is mixed with pick-up and drop-off systems. Residents in Munich have to carry some of the household recyclables to designated locations for proper recycling. In most houses and apartment buildings, there are bins for some categories (such as paper) in the building. Categories of recyclables in Munich are more complicated than in New York City. For example, different colors of glass are to be placed in separate bins (transparent, green and brown, see photo below.) It is also noteworthy that the general garbage is called "Restmuell" in German, literally translated as "residue waste". More details can be found in the waste stream/recycling flow charts in the later part of this chapter.

It is worth noting that most places in Germany use of Gelbesaeche (yellow bags) or Gelbetonne (yellow bins); however, this system does not exist in the inner city of Munich. Yellow bags and bins are designated for all sorts of packaging recycling and are picked up instead of requiring residents to carry them to drop-off locations. Figure 7 below shows yellow bags in a resident building in Feldkirchen[8].

Figure 7: Yellow bags (Gelbesaeche) recycling in a resident building

In order to illustrate the differences in the complexity of recycling programs in Munich and New York City, I created the two diagrams below to show the household waste streams in the two cities. The household recycling scheme in Munich is more complicated. As Figure 8 shows, it is a mixed pick-up and drop-off system.

[8] Feldkirchen belongs to the Munich District (Landkreis München) and is located at 10 km (6.2 miles) east of Munich City.

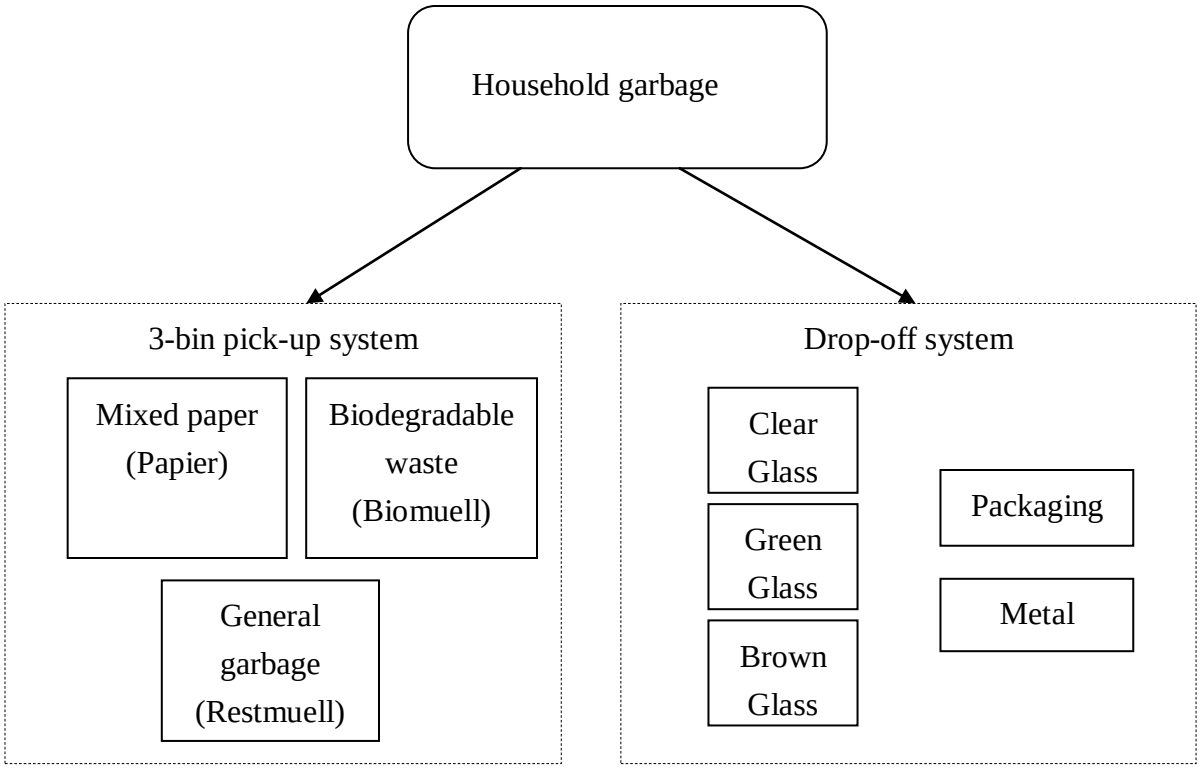

Figure 8: Household waste stream/ recycling scheme in Munich City

2.4.3 Recycling in the United States

There is no federal law mandating recycling in the United States. Each state and local government is responsible for launching and running recycling programs. While some cities like Seattle and New York have laws to enforce recycling, many other areas either rely on voluntary recycling programs or do not have recycling programs at all. As a result, unlike German interviewees who were unanimously familiar with recycling programs before moving to NYC, American interviewees came with a wide range of recycling knowledge and experiences.

Among the most well-known recycling practices in the US are the container-deposit

legislation popularly known as bottle bills. Currently only eleven states have this type of legislation. Oregon passed the first container-deposit legislation in the US in 1971; the latest state was Hawaii, starting in the year of 2005.

2.4.4 New York City's Recycling Program

New York City's recycling law (Local Law 19, Chapter 13) was first passed in 1989. Initially, the program—which required changing millions of New Yorkers' habits of garbage disposal –was not thought to be successful. It was regarded as "just a fad" that "won't do any good" in New York *Times* articles from around the time of its passage. The City government conducted extensive recycling outreach and educational programs; flyers were put on subway trains and in the yellow pages. The number of recyclable items expanded and pickup schedules became more frequent over the years. Finally, in the year 2000, NYC began its "full service" in five boroughs: municipal trucks and crews collect recyclables curbside once a week from every household in the city.

New York City residents separate recyclables into just two categories, one for mixed papers (green recycling program) and the other for selected materials made of metal, plastic and glass (blue recycling program.) The recycling law specifies the penalty for violation: it carries fines of $25 for the first infraction, $50 for the second, $100 for the third, and $500 to persistent violators who commit four or more violations within a six-month period. The fine has less direct impact on apartment buildings because of shared recycling containers. It is difficult to get tenants who commit violations; instead, the fine will go to the entire building.

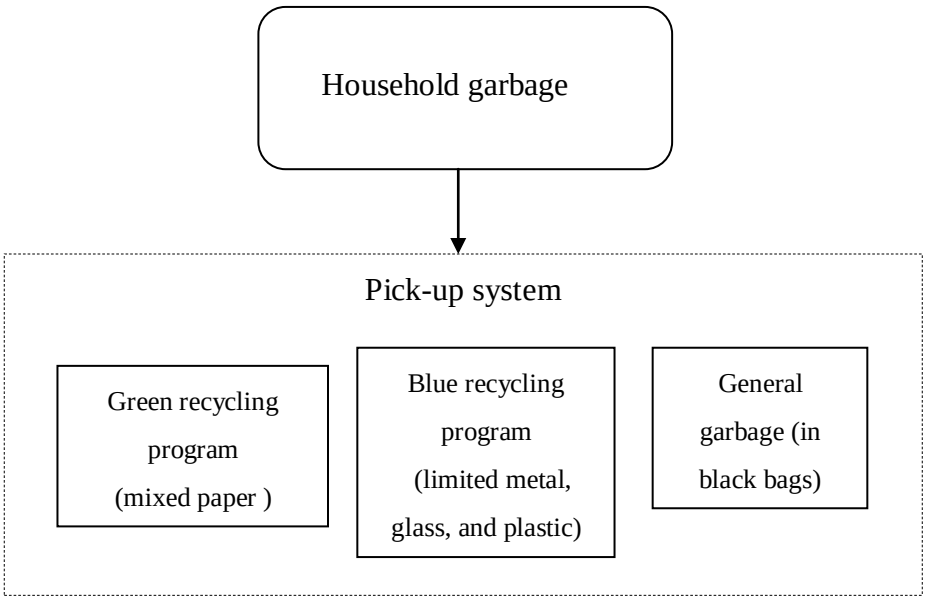

Figure 9: Household waste stream/ recycling scheme in New York City

Two-year suspension

Not long after the launch of full-service recycling, the City Government suspended parts of the program due to the post-911 financial distress. In February 2002, Mayor Bloomberg presented the preliminary budget for fiscal 2003. He announced the suspension of the metal, glass, and plastic (MGP) recycling program because it was costing more money ($230/ton) than regular garbage ($130/ton.) He kept paper recycling not only because it was ecological sound, but "it saved us money" (paper recycling cost $78/ton.) In the same speech, he also revealed an ugly bit of data that was kept unknown to the public: only 40% of collected MGP recyclables were actually recycled; the rest ended in landfills (Bloomberg, 2002). While the mayor did not explain further why the majority of MGP was not recycled, the numbers stirred up vigorous discussions and criticisms especially from recyclers who felt their efforts had been in vain. For instance, Bloomberg's decision was considered to "disregards an ethic that has grown in many

New Yorkers -- an ethic that the city itself helped establish with a highly visible public education campaign. (Ashkin, 2002)."

The suspension partially ended in 2003 with glass recycling back

and finally the entire recycling program resumed in 2004.

2.4.5 New developments in recycling programs

There have been new developments in New York City's recycling program following my data-collection phase. While they do not affect the background of my research participants' experience at the time of the interviews, the changes show the ongoing trajectory of urban recycling program and should be noted when reading the study.

A. Public Space Recycling in New York City

The NYC Department of Sanitation began a Public Space Recycling Pilot in the spring of 2007 which increased opportunities for recycling in the city. Between April and June of 2007, the pilot program was implemented in six parks and two ferry terminals. An evaluation showed that paper recycling worked the best of the public space recycling programs. The city continues to expand recycling opportunities in public spaces; more than 50 sites in all five boroughs have recycling containers now.

B. Street Event Recycling

In 2009, Local Law 13 was enacted to mandate recycling at street events including book parties and street fairs. Violations will result in fines starting at $100.

C. New Recycling Laws:

In 2010, the New York City Council passed 11 Local Laws to update and expand

NYC's recycling programs. The new laws include expanding public recycling programs, sponsoring hazardous waste collections, expanding plastic recycling, improving recycling education, increasing fines, and improving food waste composting. The package of legislation, already signed by Mayor Bloomberg on August 16th, 2010, is expected to expand the city's recycling program significantly.

Chapter Three: Beyond recyclers and non-recyclers

While "recycler" and "non-recycler" have been used to analyze and label people's recycling behavior, in my research I found the dichotomy failed to accurately display a wide range of orientations to recycling attitudes and behavior. In this chapter I will demonstrate people's recycling orientations based on what, where, when and why, in a much more dynamic and complicated way than what were shown in most existing studies.

3.1 Narratives on garbage and recycling

Post-consumer recycling is closely connected to the broader issue of garbage disposal. It rescues useful parts of trash and converts them back to resources. To better understand people's perspectives on recycling, I began the interview with an open-ended question: "How do you think of garbage in your life?" While responses differed in complexity and richness, those narratives provide a glimpse at the various ways people conceptualize garbage and resource.

Eckart, from Germany, described himself as a sustainable architect, working for an international company on the Lower East Side. He described his changing view of garbage:

> I got this thought of goods and garbage more like black and white, but nowadays they've become more like a circle. And what a person puts on the garbage could be used or made into other products. And recycling is one little piece that comes out of the circle, which includes maybe, reusable materials. Now I think about it in wider terms…from putting all things to the garbage can, goes all the way to

> how you use things, how to handle and take care of things so that they'll last longer.

The words showed his understanding that garbage recycling is not as simple as putting paper in this container and plastic in another. Recycling is closely connected to the full life circle of how goods are produced, transported, used, disposed…etc. Another German interviewee, Karl, further connects his life with the management of objects:

> I think of garbage as a complicating factor of life, like an abstraction of life. It's just getting unfolded, so we have to look for forms of how to arrange ourselves with the garbage. And I think part of it is the garbage disposal, and part of it is the management of objects that no longer serve any use but not yet to the state of being garbage. The line is blurry, probably.

As Karl described, the line between garbage and resource is blurry; the same fuzziness applies when people deal with those objects. When we contrast the complexity of people's narratives of garbage and recycling with current psychological portraits of recycling behavior, it becomes clearer that the existing framework does not capture people's recycling behavior to its full capacity.

Schultz, Oskamp, and Mainieri (1995) conducted an extensive literature review on personal and situational factors influencing recycling behavior. In an article entitled "Who Recycles and When?" they found that the focus was either on "who" (41 studies on personal correlates) or on "when" (30 studies on behavioral interventions.) In this chapter I will broaden the discussion from "whether", "who" and "when", to "what" and "where".

3.2 Behind the words "I Always Recycle"

A simple yet quite common way to quantify recycling behavior is to rely on self-reports of recycling behavior. Questions like "Do you recycle?" or "How often do you recycle?" usually use a yes/no dichotomous measure, or a simple 3- to 5- point scale from "never" to "always." But what do people really mean when they claim that they always recycle? Does that indicate that wherever they are, whatever they have in hand, they *always* dispose their waste into appropriate receptacles? Throughout my interview process, I observed that when people answered the question of "do you recycle?" and "what do you recycle?"— even when the answers were "yes, I always recycle" or "Oh, I recycle everything", they commonly qualified these absolute claims later in the conversations.

When people declare they always recycle, we are actually looking at a wide range of actions and reasons: people tend to think of themselves as serious recyclers if they feel they are making efforts to recycle even though the efforts may differ a lot depending on the material being recycled or under differing circumstances. Talking to people in depth, following up with questions on details and stories helped me decode the so-called "I always recycle" into many different facts or perceptions: "I make efforts," "I can list the items I separate," or in comparison: "I recycle more than other people/ my family in the USA/ other Americans" or they compare themselves to what they did before relocation. 'Always' is not actually an objective 'always' and could imply "I recycle those materials I'm sure are recyclable."

Furthermore, unveiling the reality and complexity of "I always recycle" is only a first step towards further analyses of how people deal with different kinds of garbage, at

different locations, and throughout different periods of time in their lives.

3.3 What to recycle? Different recycling behavior based on types of material

The first dimension I would like to discuss about people's recycling behavior is whether and how they recycle different things in different ways. A few recycling studies focused on specific materials, mostly to simplify and control the research or to evaluate a particular recycling program. Examples include discussions about recycling aluminum cans on university campuses, obstacles to recycling electronics, or effectiveness of incentives for recycling newspapers. No research has yet tried to identify the individual's behavior in recycling different materials- they were studied as *examples* of a particular type of recycling. We know little about whether, how, and why people treat recyclables differently. As Schultz and colleagues' pointed out at the end of their review of recycling studies, the limitation of current research was that we do not know to what extent the recycling of one material predicts the recycling of another (Schultz, Oskamp, & Mainieri, 1995). It also remains unexplored how recycling different materials is related to various reasons for recycling and not recycling.

Before providing a more detailed discussion, it is important to first address the issue of why material matters. Recycling has been studied under the umbrella of pro-environmental behavior. Psychologists constantly attempt to understand recycling behavior through the lens of environmental attitudes, which implies the belief that, if individuals value the environment, they tend to do various things to protect our planet. Garbage recycling is so commonly associated with environmentally responsible behavior that sometimes we underestimate other non-environmental factors contributing to it. In

the ideal scenario, wastes are supposed to be separated based on their reusability and recyclability; after collection, they should be further broken down and recovered to their reusable status, or turned into raw material for other uses. Recycling is meant to avoid new exploitation of resources and minimize wastes that go to the landfill. We are hoping that, after weighing the energy needed in the process, recycling is still doing better for the environment than otherwise.

In reality, non-environmental factors are much in control throughout the entire recycling processes including the policy implemented (which determines what to recycle), the interaction with economics (what makes profit), and then the link with consumers (who spend time and arrange space for recycling as well as acquire related knowledge.) In the course of my research, it became clear that non-environmental factors often overpower and complicate people's recycling schemes. Recycling thus should not be viewed and studied as *one* behavior and should not be even assumed to be environmentally-friendly for everyone.

Bad Doggie provides a good example of weighing economic and overall environmental factors into what he decided to recycle and what not to recycle. He used to believe in and even advocate for recycling, including starting a campaign on his college campus, educating his own grandfather…*etc*. As he acquired more knowledge about the recycling industry, he realized that not all recycling is good for the environment. While his beliefs and knowledge are debatable or even doubtful, it is true that recycling different materials involves different levels of energy consumption, inevitable pollution, and additional transportation in some cases. After weighing both environmental and economic factors, he developed an eclectic way of recycling: he recycled those materials that he

believed to be truly good for the environment: aluminums and he also recycled beverage glasses with bottle deposit ("Pfand" in German) but nothing else. He also made it clear that it was a compromise in order to get back the deposit money, not for environmental reasons[9].

In the following sections, I will discuss different considerations and examples of recycling various materials and show how these dimensions are connected to contexts, reasons and motivations behind them. The analysis aims for a better understanding of the complexity and struggles over a seemingly simple behavior and, hopefully, it will contribute to making useful suggestions in future recycling programs.

3.3.1 Battery stories: an example

Particular objects sometimes reflect the culture of a certain place, and can trace how individuals recycle across different time and space. A battery is such an object.

In Germany, recycling batteries is commonly expected and made easy for people to do. Recyclable batteries are not limited to rechargeable Ni-Cd or Ni-H batteries but also include regular ones. However, the scenery is quite different in New York City: batteries were not included in the NYC's recycling program until December of 2006 and the law is limited to rechargeable batteries. For the majority of single-use alkaline batteries, NYC Department of Sanitation advises residents that alkaline batteries are not considered hazardous waste since they no longer contain mercury. They even emphasize it by using bold type font: "**Place batteries with your regular trash, not in your recycling bin**[10]**.**" One can imagine how difficult it is for those who used to be able

[9] More of Bad Doggie's story will be discussed in Chapter 5.
[10] New York City Government official website, accessed October, 2009.

to recycle batteries; those who knew that batteries contain harmful material and believed they should not end up in landfills. As an intriguing result, almost all German interviewees in New York City held on to their used batteries somewhere, without knowing how they could dispose of those batteries properly in this city.[11].

Lack of proper battery recycling becomes one of many examples that Germans actively pointed out as a dissimilarity in the recycling cultures of the two countries. Sabina, who moved to the United States twelve years ago said:

> We have [recycling] for the batteries, all the stores they have those little batteries recycling… you don't have that here in America. I never know what to do with my batteries. […] I have a big bag of batteries, and I don't know what to do with them. And I don't want to throw them in the garbage.

That big bag of batteries is still somewhere in her apartment; it contains all the used batteries she has collected all these years. People's past recycling experience in conjunction with environmental knowledge made them feel bad to just dispose of used batteries along with other general waste when knowing it harms the environment. But lack of opportunities made it very difficult to finish their intended action. Batteries are piled and puzzles remain.

On the contrary, Americans who moved to Germany started to acquire a new knowledge that batteries are recyclable and should be recycled. The experience of battery recycling in Germany formed a sharp contrast with the lack of knowledge and

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http://home2.nyc.gov/html/nycwasteless/html/at_home/more_resources.shtml#batteries

[11] Effective December 2006, New York City's Rechargeable Battery Law (Local Law 97 of 2005) makes it illegal for New York City residents to discard rechargeable batteries in the trash or residential recycling containers.

opportunity to do so in the United States. David recalled his unpleasant encounter on one of his trips back to the States:

> Once I was in New Mexico, long after the recycling has taken here [Germany], years after one is used to them, I had a camera, and the batteries in it. And then the battery is out, and then I went to a camera store, and they said, "we're not taking the batteries." I put the batteries on the counter and asked them, "Could you please take these and put them in the proper receptacle?" I was thinking ahead in that way too, because there's heavy metal in it, there is nasty stuff in those batteries. And he says, "oh, ok." He took it and threw in the waste basket. And I was just stoned, 'cause I thought I was doing my part, and suggested that [it] be recycled properly, and apparently it's not part of the local community's consciousness. Maybe it's still not.

3.3.2 Mixed Types of Material

Products with mixed material often make it difficult for people to evaluate whether they are recyclable or not. Common objects like envelopes with clear windows (paper and plastic), soiled juice cartons (cardboard with wax treatment), and light bulbs (glass and metal). With the exceptions of single-bin recycling programs in some cities (as in Chicago), no matter whether mixed material is necessary for products, recycling can be made much easier if people can easily separate those different materials. A good example is the design of yogurt and fruit buttermilk cups in Germany (please see Figure 10.) Each cup can be divided in three different parts: the plastic cup body goes to the packaging bin, the wrapped paper with printed information goes to the paper pile, and the aluminum top seal goes to the metal bin. There are even instructions printed on the yogurt

cup directing people to tear apart the little yogurt containers and put them in designated bins. The hints of "affordances" within the products will be discussed more fully in Chapter Four.

Figure 10: Easy detachment of different parts in a fruit buttermilk cup

Another example is padded envelopes. Audrey, who moved to Munich five years ago, found it easy to separate the bubbled part from the paper envelope so that she can put the padding into the plastic bin and the envelope itself into the paper pile. It contrasts with the padded envelopes she brought from the United States; she still does not know how to deal with those envelopes, since the padding does not come off easily.

3.3.3 Biodegradable Waste

In Munich, biodegradable waste is collected separately (in brown bins) but organized along with paper (blue bins) and regular trash (Restmuell, in black bins.)

Together they formed "the three bin system." Different from glass, metal, and plastic which residents are required to carry and drop off in the designated containers in the neighborhood, biological waste can be easily recycled inside or right outside the building. However, it is one of the most challenging recyclable categories in Germany. The challenge is associated with the nature of biodegradable waste: they decompose and start to smell much faster than other types of waste.

3.3.4 Knowledge, Imaginations or Myths on the destination of recyclables

Post-consumption recycling is only one knot of the entire recycling industry. Where do all the recyclables go after they are collected? In the ideal situation, as in most people's imagination, those cans, bottles, and piled paper will be further sorted, processed -- may be cleaned, crushed, melted, bleached…etc.-- and valuable material will recover to a reusable status. But is that always the case, or is it even near the truth? Not always, unfortunately. As mentioned in the last chapter, in 2002 only 40% of the collected metal, glass and plastic recyclables in New York City were recycled. A similar situation occurred in Germany too: only 70% of lightweight packaging collected was recycled due to limited capacity in Germany.

How is the destination of recyclables related to the ways people think about and act upon garbage sorting? Only a few studies dealt with this issue indirectly by linking *locus of control*- i.e., the extent to which people feel their actions could benefit the environment, with the targeted behavior (Allen & Ferrand, 1999). In this study, different types of knowledge, imaginations, and even urban myths or "rumors" contribute to how people evaluate their own recycling efforts.

Karl, a German participant living in Brooklyn explicitly linked knowledge of the destination of recyclables with his motivation to recycle:

> Nobody knows where the garbage goes. You never hear such things. It's like other things that are kept out of sight. People don't want to talk about it. So the public never learned what happens to the garbage. And you never hear like how much percent garbage are recycled, you never hear about that. Maybe because there are not many. I don't know. So I think that's actually a public policy issue. I think it's not really addressed properly. The public has no information about what happens to the garbage. And when there is no information, it's hard to motivate people.

On the contrary, information on what recyclables could eventually become encouraged people's recycling behavior. Lucinda, a dedicated recycler who moved to Germany eight years ago, was informed of the destination of recycled bottles on TV: *"....they have this cute little commercial with bottles that says, 'next year, I wanna come back as a couch.'....or something. There are really cute little ads on TV*." This piece of information matched her experience of seeing some furniture labeled as "made with recycled plastic."

The destination of recyclables influences people's choices not only about *whether* to recycle but, more specifically, on *what* to recycle. Tina was skeptical of plastic recycling. She wondered whether biodegradable waste and plastics are really recycled, and her suspicion apparently influenced her recycling practice. Paper and glass did not invoke any doubts and she just continued to recycle them. People can easily imagine

papers being recycled; with common recycled paper products in the market, it also helps to build the belief that paper recycling is indeed happening. The distinct three-color glass recycling bins all over Germany also makes people believe glass recycling is taken seriously.

3.4 Where to recycle? Recycling behavior by different locations

The second dimension to consider regarding people's recycling behavior is based on types of locations. For example, recycling at the workplace can be more challenging than at home because of the lack of full control over the place. Unlike the home environment where people can usually arrange containers in their preferred places and accomplish the intended behavior more easily, workplace recycling relies on whether and how the organization practices recycling. A similar situation occurs in public spaces: when there are no proper containers for recycling, people are left with few choices about how to discard the garbage.

The phenomenon that people recycle differently depending on where they are clearly indicates the limit of static categorization and description of people's recycling behavior. Moreover, spatially-differentiated recycling behavior also connects with various reasons, motivations, obstacles to recycling, which should not be treated independently of other dimensions of recycling behavior. Some of the phenomena can be considered and examined with the concept of *recycling affordances*, which will be discussed in more details in the following chapter, in conjunction with analyses of different contextual factors.

3.4.1 Workplace

Recycling difficulties in the work place occurs when the program is not integrated with the users' daily life routines and is often perceived or interpreted as an inconvenience. For a rather typical example, Abel talked about the challenge he faced in efforts to recycle some items in his workplace. In his office, there was only one regular trash bin. Usually, when he was talking on the phone or was busy with something else, he would just throw the empty yogurt container into the trash can. He said, *"if I have like three compartments in there, there's no problem. But in our work, we usually have only one trash bin, which I throw all in there."* Even though the cleaning lady in his office actually told him that he was supposed to separate it, he considered it difficult to walk in the middle of his work all the way to the garage where the proper recycling containers were.

Abel's story exemplified the case of not being able to recycle as much in the workplace as at home. Lacking control over the environment with the resulting inconvenience is not the only reason. As discussed earlier in this chapter, doubts about the destination of recyclables discourages people from taking recycling seriously. Karl once heard that all recyclables got picked up and mixed with regular garbage in his office building even though there are recycling bins clearly labeled for different items. When I asked him whether he still recycled at work, he responded, "*I have two bins in my office, and I still do it, maybe not strictly strictly, but I do use the blue bin only for paper. That's maybe a psychological barrier. But it's certainly not motivating."*

Compared to home environments, more agents are involved in the entire process of recycling in the workplace which probably makes the destination of recyclables even

less transparent and the sense of control is decreased accordingly. In a more extreme case, people with very strong environmental attitudes could make more efforts to obtain more control or to change the current situation. Eckart -- the architect of sustainability-- fought with the superintendent for recycling in his office building, a mixed-use building on the Lower East Side. Being part of an international team focusing on environmental architecture, Eckart and his co-workers wanted to recycle but noticed that the management company of their building never separated garbage. They started putting things in different containers, bags and bins, but only found out that the superintendent packed everything back together. Knowing that it is NYC law to recycle, Eckart approached the Spanish-speaking only superintendent several times for proper recycling. At the third attempt, he advanced his efforts by printing out a recycling poster and explained to him and expected things to be changed, but only witnessed the garbage was still packed together. He took a further step and made a complaint to the management office but later he found out that the building hired a private company for garbage collection and recycling.

3.4.2 Public space

Recycling in public space is usually even more challenging than at the workplace or home. As mentioned in the last chapter, New York City public recycling only started piloting in limited locations in the spring of 2007 (see Figure 11.) As of now, more and more recycling containers have appeared in public places in New York City, but the scene was very different at the time of the interviews.

Figure 11: New York City started piloting public recycling program in the spring of 2007.

Limited recycling opportunities in public spaces affects people's recycling pattern in a way that they only recycle certain products. As Tobias commented on the recycling opportunities in New York City, "*Usually I'd be just glad if I find any bin on the street. If the thing is small and clean enough, I'd just keep it with me*". While the interviewees did not link the size and cleanness of the rubbish when they talked about

recycling at home, they seemed to be more crucial factors in public space especially when recycling bins were hard to find.

Recycling experience in public space easily triggers comparisons between the United States and Germany; as Sarah, an American exchange college student commented*: "In the US on the street, you can't recycle. You can throw bottles out [in general garbage cans], but there's no recycling. But here, in general I find a place to recycle."* As a result, Americans living in Munich recycled more consistently across different locations compared to when they were in the US.

Lacking opportunities to recycle in the public space can be very frustrating and even evoke negative emotions. Sabina used to recycle easily in public spaces in Germany but was unable to do so in New York City. She said, "*it hurts…sometimes I don't agree. I don't feel happy to do it, to see everything thrown together. In some way it made me angry. It should be separated.*"

3.4.3 Places beyond daily life

Along with the trend for global travel, more and more tourists appear in different parts of the world. Cities like New York and Munich are filled with global tourists--flooded in high seasons. Do people participate in pro-environmental behavior when they are on vacation and travelling to other countries as much as they do at home? Among very few studies on this topic, Dolnicar and Grün investigated heterogeneity of environmentally friendly behavior between individuals, and across different contexts/environments. The authors segmented their sample into six different groups based on the variety of pro-environmental behavior involved, confirming their hypothesis on inter-individual heterogeneity (Dolnicar & Grün, 2009). Their results showed that, to

some extent, pro-environmental behavior is dependent on the context/environment but those changes are usually unfavorable from an environmental perspective: people tend to become less environmentally responsible when they are on vacation. The only group (or segment, in their word) of people who did not change their patterns is the most "environmentally friendly" group. To understand the nature of the environment-dependence of pro-environmental behavior, they also asked people the main reasons for behavior differences in different contexts. Most responses were related to feeling more responsible, having more control, along with more financial consequences at home.

My research to some extent corresponds with the conclusion of Dolnicar and Grün's studies: people tend to be less careful when they are traveling. When I asked people about their recycling experiences in other countries, many interviewees said that they did not pay attention to recycling opportunities and often assumed there were no separate recycling containers. Interestingly, instead of recalling their own recycling behavior in the travel mode, many interviewees commented at greater length about their "garbage cultural shock." For example, a few people talked about how shocked they were when seeing garbage treated in a careless way: just piling up on the street corners (in Cairo) or being pumped into the ocean (in Venezuela.) Their observations and relatively negative comments, as I interpreted them, are more than rationalizing their lack of pro-environmental behavior in those foreign countries. Instead, I think of them as reflections on how surroundings may influence people's perceptions and behavior decisions. It is clear that when people travel to a place where garbage is handled carelessly, not only is it almost impossible to recycle properly, but there is no motivation

for them to do so. On the contrary, if recycling opportunities are fairly visible, people are more likely to participate in recycling. It suggests that in addition to the home versus travel modes that may contribute to people's heterogeneous behavior patterns, the nature and quality of the environmental friendliness of the target place can have more significant influences.

Moreover, a little similar to what Dolnicar and Grün referred to as individual heterogeneity in pro-environmental behavior, individual differences are visible in people's observations, attitudes, and behaviors when they either traveled or shortly lived in other countries (other than the US and Germany.) The differences seem to be intertwined with both their environmental attitudes and previous experiences with recycling. German interviewees used much more often their home country, Germany, as a reference point, when they recalled and judged the recycling situations in the foreign country. Words like "shocked," "disappointed," "not as good as Germany" were used. People with more serious attitudes towards recycling also tended to make more efforts to explore recycling possibilities and shared more detailed observations of garbage - sorting activities when they traveled to another country.

3.5 When to Recycle? Recycling History and Changes in Recycling Behavior

Broad environmental consciousness and specific recycling behavior do not exist in a vacuum. People acquire, learn, develop and evolve their thoughts and attitudes throughout their lives. By acknowledging the dynamic nature of recycling orientations, I will explore the temporal dimension of people's recycling orientations. In addition to objects and locality described earlier, in this section I will trace whether, how, and why

recycling attitudes and behavior change over time. Temporality has not been extensively discussed in recycling studies, possibly in part due to the popular modes of inquiries using static, cross-sectional questionnaires. Mentions or measurements of time in recycling studies are mostly limited to experimental interventions such as comparing before and after certain incentives or altering different designs and locations of recycling receptacles. Rather than treating time as a pre-defined period (for example, one month after the intervention) as a universal frame for everyone, time was investigated and defined by interviewees themselves. I will explore the development of people's environmental consciousness as well as look into their recycling histories to see how they acquired related knowledge and how their attitudes and behavior evolved over time.

People's pro-environmental attitudes, knowledge and behavior affect one another; they also change –fast or slow- from time to time. Demographics alone have limited power to explain people's changes in behavior at different times of their lives because many of the characteristics such as gender and ethnicity remain the same. Looking at the development of environmental consciousness and tracing their history of recycling create a more holistic view of recycling orientations. It is then crucial to ask whether and how psychological factors are related to those changes and what other factors evoke those changes.

How do people become environmentally conscious? How do individuals learn to recycle? How is environmental consciousness related to recycling practice for different people? Some studies investigated the development of people's environmental consciousness but these almost exclusively target environmental activists. For example, (Chawla, 1999) adopted the phenomenological approach and autobiographical methods to

trace what significant life experiences led to people's commitment to environmental issues. Her research in Kentucky and Norway investigated people's life paths into environmental actions. She analyzed the source of influences in different phases of their lives: childhood, university years, and adulthood. While experience of natural areas and family were major sources of environmental commitment in childhood, education and friends appeared to dominate the university years, and organizations and vocations were reported most frequently in adulthood.

Similarly, participants in my study talked about various factors influencing the development of their environmental consciousness and recycling behavior at different stages of time. While there will be more detailed and case-specific discussions of recycling behavior transitions in Chapter Five, here the discussion will focus on various reasons that could cause changes in recycling behavior over time.

3.5.1 Recycling history and the development of environmental consciousness

Recycling history can sometimes be traced back to people's childhood and the way they were brought up in the family, with the memory of how their parents or other family members dealt with garbage. Sabina recalled learning how to recycle in her childhood:

> I grew up in Germany, when it comes to recycling, there are much more…much more care about the environment than here. I grew up with my mother, I remember when I was a child, she separated: the fruit was at the certain box, and paper…that's how I was raised. We separated everything. Then I came here to America and see people throwing everything in one garbage … it's always painful for me to see that. I don't feel good. Most people here don't really care. They just

> throw everything together, in one box. **I try to do as much as I can recycling… we separate paper, plastic, that's it. There's only two separations. In Germany, I put much more.** [emphases added]

The above passage showed how Sabina's recycling orientation was influenced both by recycling opportunities and by cultural differences and social support. The disparity not only changed her way of garbage sorting but also evoked emotional responses. The big contrast between the way Americans deal with garbage (throwing everything together), and the way she was brought up (separating everything in great details) made her feel pain.

Learning to recycle is sometimes unrelated to the development of environmental consciousness. In addition to its environmental significance, recycling also converts available resources into monetary gains (more details will be discussed in the next section: reasons for recycling.) Randy talked about his experience of growing up in the late '60s: he and his friends would look in the bushes for Coke bottles and take them to the grocery stores to redeem money.

3.5.2 Changes in recycling possibilities:

Because this study was designed to see whether and how relocation had effects on people's recycling behavior, changes in recycling possibilities were mentioned as the major reason that people changed their recycling behavior. Even though recycling programs exist in both Munich and New York City, program details and scopes are different. A large proportion of American interviewees lived in places where recycling did not exist or was not mandatory, so when they relocated to Germany where recycling and recycling programs are consistently available, they learned to change their garbage

sorting behavior. The learning process was not always smooth; especially for those who did not separate their garbage before, it could be a daunting task. Like Jenny described: "*I think that recycling in Munich is very thorough, but very complicated, and very confusing. I moved here 3 years ago from California. And what we were told in California was that, we didn't need to recycle.*" Realizing recycling is mandatory in Germany, Jenny started to recycle; she learned what items to recycle by matching them to the pictures on the recycling bins: "*…if it weren't the pictures, I wouldn't know anything.*"

Virginia did not think much about recycling when she was in America: "*I didn't really think about it. It's more like: 'Ok, they don't have recycling, so I'm not going to worry about it.*"' After moving to Munch and starting to recycle, she was amazed by how much recyclable garbage one person could separate from general waste.

For Germans who moved to New York City, the situation was quite the opposite. Even though recycling is mandatory in NYC, it is not as thorough as in Germany in terms of types of materials they could recycle and types of places with recycling opportunities. For example, some mix-used buildings did not use the municipal garbage service but hired private waste disposal companies for post-consumer sorting to fulfill their recycling responsibility. Residents living in such buildings did not recycle in the building (a detailed example will be given in Chapter 4.) In general, recycling containers are not common in some work places and even less available in public spaces.

Kai talked about feeling "liberated" from sorting and recycling garbage after moving to New York. In Germany there was a system that made him really aware of what he threw, which just did not exist here, especially in public spaces: "*Here you just throw everything away. If you have a can of soda on the street, you just throw it away in*

the garbage." In his words, he adopted the "American way." Lacking opportunities to recycle certain items could also change people's recycling patterns: like the battery examples discussed earlier in this chapter.

3.5.3 The influence of the social milieu and different cultures of recycling

In addition to changes in the available programs in the area, recycling orientations could be also under the influence of different social milieu or cultures. Social factors usually go hand-in-hand with recycling opportunities when both of them are strong. In places like Munich, a thorough and consistent recycling program coupled with a perceived pro-recycling social milieu encourages and sustains not only recycling but other environmentally-friendly behavior. After moving to Germany, many Americans said they started recycling seriously, producing less garbage, taking public transportation or biking, and using less energy. When they attributed reasons for those changes, in addition to the thoroughness and convenience of Germany's recycling programs, they often pointed out their perception of the sense of social responsibility and the environmentally-conscious cultures. Social influences work both on peoples pro-environmental consciousness and behavior. For example, Virginia again, talked about how she learned through neighbors and friends in Germany how to separate different components of her garbage for recycling and how to use the counter-vending machine to get back the bottle deposit. Her feeling of social responsibility and the environmental mindset in Europe reinforced her environmental thinking:

> I think Europe as a whole seems to be more conscientious about the environment, things like that. It's just a different mindset. I think differently here. I always have thought a little bit differently in the States, like when my sister kept using paper

> towels for everything, I'd say, "here's the cotton towel, keep using those." But here, there's something different. There's some sort of social responsibility that I seem to feel here. (M03, Virginia)

In contrast, Germans felt that people were relatively less careful about recycling after they moved to NYC. Sabina described her frustration when she first encountered different social expectations: "*When I go to my friend's place and asked about recycling, "recycling?" they looked at me like [pause]… they don't know what I'm talking about.*" Later in our conversation, she admitted that she became less careful with recyclables and a bit less concerned about the environment:

> Even when you grew up with separating garbage, you get used to it, it becomes part of your life, then you came here and people just don't care, it's not that…..coming here, I think you get a little less concerned, just a little less aware. (N06, Sabina)

In addition to the influence of the social milieu on how people categorized wastes, there are also differences in the way people produce garbage in different social cultures. Kai (N04) talked about how moving to the US changed his garbage-producing and recycling pattern: "*I think since I came to America, I know that I produce way too much waste. That I know for sure."* Later on he accounted the changes: " *I take on more of the kind of casual way of Americans. You know, I'm certainly not as diligent sorting out of garbage and recycling as my family, when I was in Germany….*"

3.5.4 Changes in knowledge and lifestyles

Changes in recycling orientations could also originate from non-context related factors. A few people talked about their changes that were not directly related to their

relocation experience, such as acquiring new knowledge by reading or watching television, changes in lifestyles (like Lisa realized she produced more garbage after having a baby.) Changes in recycling behavior may also result from finding out specific local recycling situations. Melanie stopped separating compostable wastes after seeing their garbage staff mixing biodegradable garbage (Biomuell) with general garbage (Restmuell). Some of the changes are more salient when we take a closer look along people's life paths which will be discussed in more details in Chapter Five.

3.5.5 Discussion

By learning and practicing recycling in everyday life along with an environmentally-friendly milieu in Germany, American interviewees changed not only how they think about recycling but how they produced and sorted garbage. The influence extended further to other environmentally friendly behaviors such as saving more energy, taking public transportation more frequently, using environmentally friendly products, and so on. In contrast, most Germans who moved to New York City went in the opposite direction: producing more garbage, being less careful about recycling and so on. Changes in different aspects of pro-environmental behavior seemed to emerge as a result of lifestyle changes, under the influences of changes in both the quality of the recycling programs and their social environments.

Karl shared the story of how his recycling attitudes and behavior changed under the influences of living in different neighborhoods, cultures, and policies:

> ….in my life I've been moving so many times. I haven't stayed in the same states, for maybe no longer than 2 years at a time, for the past 20 years or so. I just keep moving all the time, so before you actually become a real member of

> the community, you move again. I **think the whole recycling has also…it attaches to the community setting, so every time we move, there're different approaches to different countries, states, cities**. For example in Hong Kong they don't have plans in garbage and recycling so there were very little efforts there. Then in New York, I remember very clearly was when Mayor Bloomberg's administration abolished recycling. I remember that they were looking for conservation possibilities and they found if you stop recycling you can save 50 million dollars. They decided to stop it, so maybe they didn't stop completely or they revived some, but **the message in my mind was that New York doesn't care about recycling**. I remember he continues to say that we can save 50 million dollars by stopping recycling. It may save 50 million dollars for the next year but I think in the long term I don't think it's a very convincing argument. But he left me the impression that they're not serious about recycling in New York. [Emphases added]

Karl later on explained how the sense of community restored his recycling habits. His change supported the idea that both quality recycling programs and supportive social environment are important. Elke, another German interviewee, talked about her recycling practices which changed with the different neighborhoods in which she lived in after moving to the USA. Her environmental consciousness and pro-recycling attitudes did not change over the years but the context made it difficult for her to recycle the way she wanted. (Elke's story will be discussed in more details and depth in Chapter 5.)

Examining the temporal dimensions of people's attitudes and behavior helps us to understand and depict their recycling orientations better. It gives us a more dynamic

view and a historic perspective of people's recycling life paths which provide the potentials to be transformed into more desirable recycling experiences. I will elaborate more on people's attitudinal and behavioral changes after relocating to another country in Chapter 5.

3.6 Why do people recycle-- or not?

At the macro level, modern recycling programs initiated and continue to reduce the amount of garbage and numbers of landfills, as well as to recover the material and decrease the exploitation of natural resources. From the government's viewpoint, a recycling program works best when it is both environmentally sound and cost-effective. In addition, it also enhances the green image of the city or country. Slogans like "NYC recycles" are not only a reminder for its residents, but a label to proudly show that the city is doing something good for the environment. Complicated by many policy-implementation and economic considerations- not all recycling programs are economically viable- the two-year recycling suspension in New York City was a dreadful example for many people who believed in and practiced recycling. While discussion of the macro-level rationales for recycling is not the focus here, there has been some research and detailed analyses of economic factors and political forces relevant to recycling (Ackerman, 1997).

In this section, I would like to address the question of "why do we recycle?" at a micro level and examine it from an individual point of view. There are many different reasons behind people's various recycling patterns. Instead of giving people limited options to choose from, I directly asked them why they recycle or not, usually in the context of when they explained what and how they categorized garbage and recycled.

Because of the semi-structured nature of these interviews, the answers sometimes came out even before I asked the questions directly. This format gave interviewees more freedom to retrospect and interpret their own behavior. After discussing the different dimensions of people's recycling behavior, this section will build on the multi-dimensional point of view as indicated earlier: to discuss why people recycle certain things at certain locations, at different times of their lives. As I will soon demonstrate, there is usually a combination of several reasons supporting people's recycling choices and patterns. Understanding these reasons in the corresponding material, spatial, and temporal context of recycling will help us get a whole picture of recycling orientation patterns, find potential ways to design better recycling programs, and enhance recycling opportunities as well as reduce obstacles.

3.6.1 Reasons for Recycling

Recycling has its history of recovering limited natural resources- starting with more physical values (like collecting metals to redeem money) in which economic reasons dominated, then moving towards more metaphysical values (feeling they were doing something good for the environment) in which environmental concerns came into play. There have been some studies discussing material versus post-material values associated with pro-environmental behavior; most studies support the view that people are motivated to engage in environmentally responsible behavior mostly after their material needs are met and they are in search of fulfilling post-material values. Some studies, however, contested this hypothesis and showed environmental attitudes could not be explained well by the materialism and post-materialism dichotomy (Grendstad & Selle, 1995). Physical or metaphysical, individual or collective--- I found in my research that

people usually recycle based on a mixture of different reasons competing with reasons for not to recycle. These reasons are usually not fixed to the person but are interactive with time, space, material and other people. Reason A may be prioritized in one setting but fade out as background in another. Even though this research was not designed for untangling the seemingly tangled relationships among different reasons, I will display its variety through participants' own words and reasoning and hope to shed some light on further research possibilities.

Good for the environment

Not surprisingly, recycling for environmental reasons appeared to be the most common one, mentioned by roughly 64% of participants in both cities. Clearly enough, recycling helps the environment by avoiding exploitation of raw materials and reducing garbage going to landfills and incinerators. A typical response would be like what Abel said, "*I think it's really good for the environment. I mean, now I know if ...let's say, millions of people are really recycling, then that's much less plastic going into the earth, and that can only be good*."

While saying "I recycle because it is good for the environment" seems straightforward enough that people usually did not explain or elaborate further, some participants linked their ecological reasoning with other issues, such as sense of responsibility, the way they were educated, and the value of the material itself. Sebastian provided a good example of his collecting bottles. When I asked him whether it is because of some monetary incentives, he said, "*No, it's nothing like that. I was actually*

concerned about the value of the material itself." [12]

Economically sensible

Compared to Germans in NYC (1 out of 11), a much higher proportion (5 out of 14) of Americans reported recycling for economic reasons. As the interviewees explained, it is mostly because of the higher bottle deposit (Pfand) system in Germany, rather than the differences between Americans and Germans. Five American cents appeared to be next to nothing compared to twenty-five Euro cents. Another noteworthy phenomenon is that people who recycled mainly for economic reasons also tended to express economy-related reservations or doubts both at the individual and at the collective level. Melanie admitted that her recycling behavior was pretty much money-oriented; she recycled more religiously those bottles with a deposit. Meanwhile, she also doubted whether plastic recycling was cost-effective for society. Melanie's case might exemplify the type of people who prioritize the economy over environment though it does not mean the two cannot coexist.

Economic values are not limited to personal economic gains. Some people think that recycling "makes sense" when it contributes to the society economically. For example, Bad Doggie considered aluminum recycling to make more economic sense compared to the recycling of other materials, even though it did not make any financial differences for him personally.

[12] Here I would like to stress that material value was described closely but differently from the environmental values. It could be conceptualized in between recycling for environmental reasons and for economic reasons. People value an object because of its reusable material, not necessarily after rational evaluation of "this is good for the environment" or to save money.

Norms

Norms are known to be linked to various environmentally friendly behavior (Guagnano, Stern, & Dietz, 1995). In psychological norm theories, social norms (usually referred to as "perceived or subjective norms") can be internalized somewhat (usually referred as "personal norms"). Internalized personal norms are also found to account for environmentally responsible behavior more than perceived social norms. While this research did not aim to investigate the processes and details of norm formation, there was a difference between German and American participants. More Americans mentioned they recycle because of social norms, like Melanie, who explained why she recycled more in Munich, "*There's more social pressure to recycle, so you just do it more.*"

The only norm mentioned by German participants appeared to be the personal norm instead of the social norm. It can be explained that the practice of recycling has been a norm in Germany for so long that it has been internalized for most Germans. It is also possible that because recycling is not perceived as a norm in the USA, Germans did not perceive it as a norm after they moved to New York. Stephanie said, "*it's a norm, ja. It wasn't something that you need to get educated in about. You just grew up with it*." She further explained that more people in Germany stick to the law more *"...everybody just sticks to the law.*"

Following the rules

Some people mentioned that they recycled because they liked or tended to follow the rules. This is a rather surprising finding because it has not been discussed in the recycling or other environmentally-friendly behavior studies. For example, Lucinda

recalled herself starting to recycle after moving to Germany, "*13 years ago, I had the impression it was [mandatory to recycle]. I'm just obedient, so I'm told to recycle, so I did it.*" Jenny even used rule-following to explain why she and her husband recycled differently: "*I don't know. I think because I am a rule follower….I like all the rules. If there's a rule, I follow it, because it's there.*"

It is also worth noting that both German and American interviewees recognized the rule-following trait as iconic German culture. When Americans talked about their rule-following behavior, they often attributed it to the German cultural influence (comments like *I became more German than some Germans.*) while Germans tended to attribute to the nature of their ethnicity, or "*the German heritage"* (Karl, N02).

Habit

Some people answered the "why do you recycle" question by attributing it to habits. The construct of habit holds a great potential to impact people's pro-environmental behavior but has been proven to be difficult to measure, especially when the target behavior involves multiple steps, like recycling. Knussen and Yule's study suggested that people who failed to recycle because of lack of habit might have had the habit of putting recyclable waste in general garbage (Knussen & Yule, 2008). They also suggested the possibility of considering each step of recycling as involving a different behavior, rather than treating recycling as a single habit.

While research on recycling as habitual behavior and its implications is still developing, participants in my study expressed both challenges and hopes of forming a recycling habit after relocating to another country. Once the habit is formed, it would sustain the recycling behavior, like Melanie said, "*After living in a different country, you*

pick up a different habit, and carry it along."

3.6.2 Reasons for Not Recycling

If knowing reasons for recycling can be used to promote and sustain recycling behavior, understanding why people do not recycle may help removing the barriers and obstacles. There have been a few studies investigating reasons for not recycling. For example, Howenstine used factor analysis to reduce the twelve non-recycling reasons into three indexes: *nuisance, location* and *indifference* (Howenstine, 1993). A more recent study targeted the role of habit in recycling behavior: Knussen and Yule examined the relationships between reasons for failing to recycle, Theory of Planned Behavior variables (including intention, attitude, subject norms, perceived behavior control, and past behavior), demographic characteristics, and situational constraints (Knussen & Yule, 2008). Survey respondents were given fifteen possible reasons for not recycling and were asked to rank them on a 5-point scale based on their importance. The most frequently mentioned reason is "recycling facilities are not easily available," followed by "I'm not in the habit of recycling" and "there are no local [curbside] recycling.) The fifteen reasons grew out of the authors' prior qualitative studies; they were tested for their correlations but not categorized conceptually or otherwise discussed extensively.

While the studies mentioned in the review of research above already captured the majority of reasons for not recycling, some more reasons given by my research participants were beyond the above scope. Most of the reasons for not recycling came out of interviews organically: participants were not given a list of reasons why they did not recycle, but were allowed to describe the reasons in context freely. Sometimes I asked "why" or "why not" if they did not explain in the first place. As a result, some

answers were not expected. For example, reasons for not recycling in previous studies were usually conceptualized as barriers or excuses rather than deliberate, rational choices. In my research, there were only a couple but strong cases in which people considered not recycling certain materials to be sensible choices.

Reasons for not recycling were identified with several different codes that I created in the processes of data analysis. Instead of listing all the non-recycling codes in parallel, I grouped the reasons conceptually. Segregating various reasons for not recycling may help us pinpoint the roots of non-recycling behavior at different parts of the sequence of recycling behavior, and hopefully it will lead to a more effective modification or alternations of those reasons. Table 3 demonstrates the conceptual groups of reasons against the reasons listed in the two studies mentioned above.

This study	Howenstein (1993)	Knussen and Yule (2008)
Faith in the system • Not good for environment • Doubt • Distrust • Mixed up together afterwards anyway • Cost-effectiveness	**Indifference** • I don't care; it makes no difference if we recycle. • Never thought about it **Nuisance** • They don't pay enough	• I can't be bothered • I don't know what to do for the best • I do not believe it is worth doing this • I reuse most of it in other ways • I don't like being told what to do • Someone else in the household does this instead • I feel that it is other people's responsibility
Efforts • No program • Quantity • Space • Distance	**Nuisance** • Not enough space in home • Too messy collecting those things • Too much trouble preparing materials • It's just too inconvenient	• I'm not in the habit of doing it • It doesn't occur to me to do this, or I forget • I do not generate sufficient waste • I don't have time to do this
	Location: • They don't pick it up at our curb • Don't know where to take it • The drop-off center is too far away • Don't generate enough trash	• There are no local collections • Recycling facilities are not easily available • I do not have a car
Uncommon reasons: • Inseparable materials. • Privacy (no shedder)		• I'm physically not able to do this

Table 3: Reasons for not recycling in three studies

Faith in the system

The first group of reasons is related to faith in the system, usually involved with challenges of the appropriateness or effectiveness of existing recycling programs, including suspicions about their pro-environmental effects, doubts about the reality of the system (whether collected recyclables are really processed), or disfavor with the

economic burdens recycling programs brought about. These reasons were usually pointed out by people who had thought about recycling at least a little more than the general population. Most of them also expressed concerns for the environment, but just disagreed (at different levels) with the ways the recycling program was carried out. Some of the distrust is government-related. Kai, for example, distrusted the American government in dealing with garbage but did not show the same reservation for the German government:

> Because…people in America just don't care about the environment as much. And especially if it's somebody…you know, everything is not really government regulated, so ..I am very suspicious of this. I know that the government put a garbage collection here as private, it's privatized, meaning that they have all these companies who pick up your garbage, and that all these rumors that they combined them all, that they have connections… you know, it's kind of sketchy. And I don't trust it. (N04, Kai)

Efforts

The second group of non-recycling reasons is related to efforts. It ranges from requiring extreme efforts to recycle (in the case of no existing recycling programs), to various moderate inconvenience (like drop-off locations are too far away from walking distance) to more minor efforts required (apartments are not big enough to have different bins.)

Similar to the findings of previous studies, the most mentioned reason for not recycling is lack of programs. Even though recycling programs are generally available both in Munich and in New York, some local variations still existed. Lacking recycling

programs could range anywhere from missing just one type of bin in certain buildings (like biodegradable bins in Munich) to the lack of separate bins for any kind of recyclables (like in some offices in New York City.) Even though some people made extra efforts in this kind of situation[13], no existing recycling program would discourage most people from doing it.

Other reasons for not recycling related to effort seem to be less generic but specific to certain materials or locations, like distance, space, and quantity. For example, people tend not to recycle biodegradable waste if there is too little of it but a small quantity does not seem to be an issue with other types of recyclables.

The different reasons mentioned above are grouped together because they all require more or less efforts. This group overlaps with some of what Howenstein referred to as nuisance and location but I would like to conceptualize them as "effort" because it seems to challenge, if not uncover, the real reasons behind common reasons. Nuisance and location are definitely common reasons for people not to recycle, but many other people including a good portion of my research participants encounter the same nuisance and location situation yet still recycle as much as they can. My attempt to re-conceptualize reasons for not recycling beyond what appears on the surface also aims at asking further what hides behind the reasons and eventually contributes to what can be changed.

Uncommon reasons

A couple of uncommon reasons noted by the interviews were related to neither

[13] For example, Cassie carried all bottles to her boyfriend's parents' house after the recycling bins disappeared in her neighborhood.

challenges nor efforts. Again, the reasons were tied to specific materials. An example mentioned earlier in this chapter: Audrey could not recycle American padded envelopes as she did for those made in Germany because German padded envelopes were designed in such a way that the plastic padding could be easily separated from the paper part. She also mentioned that she did not recycle confidential documents before she bought a shredder.

3.6.3 Between and Beyond recycling and not recycling: an integrated discussion

The two sections above listed various reasons for people to recycle or not to recycle and discussed them in relation to previous studies. Yet we have not addressed the relationships among the different reasons for recycling and their counterparts, which I would like to contemplate starting with some questions: how do various reasons for recycling work together to well-support the behavior — are there different "recipes for recycling" for different people? How do people weigh various reasons for recycling and not recycling, process them, and then translate them into actions—is that always through careful calculation and rational choice? Finally, what is the significance for environmental psychologists in understanding and analyzing various reasons for recycling and not recycling? What are the most meaningful elements in the pursuit of reasons—is it important or even possible to break down the proportions among the reasons? Statements like: "she recycles 60% for the sake of the environment, 30% in order to follow social norms, and 10% to save some money" may not be the best way to capture the dynamic and interrelated nature among these reasons.

While there has been much focus on how environmental attitudes are related to

pro-environmental behavior, I found that other reasons why people recycle could sometimes function alone, in combination with environmental reasons, or even strengthen environmental attitudes. Greta, an exchange college student from Minnesota, was spending her Junior year in Munich. When I asked her about the reasons for recycling, she said:

> I know that Europeans are environmental.. but if there's incentives for you to do it, why not do it, you know…it makes me feel..great. And if I see something on the street, I would think, well, that's 25 cent Pfand [bottle deposit], I'd just put it in my backpack. ... And I think that's definitely something that people want you to do. You know, and I think it made me… even though…..sometimes the Pfand is like 15 cents or so, I'll pick it up. I don't know, I think it's good. (Greta, M09)

Greta's statement provided a vivid example of mixed motivations for recycling. Not only it makes her "feel good" but the financial incentives along with perceived social norm (she considered it as something people definitely want her to do) encouraged her to extend the behavior beyond regular household recycling. She not only dealt with her own recycling but picked up other people's valuable trash.

Through people's narratives on why they recycle, I also found some rarely discussed connections between certain psychological dimensions and recycling behavior. Abel linked his recycling behavior to a collective contribution to the environment. It added another layer to environmental attitudes- when it becomes a social norm:

> they [the Germans] offer me the opportunity to recycle, and a lot of people really want to do it, and they encourage it, that's why I do it. And I think it's really

> good for the environment. I mean, now I know if …let's say, millions of people are really recycling, then that's much less plastic going into the earth, and that can only be good.

His statement suggested a relationship between normative behavior and sense of control: a social norm is not merely a static factor of people's pro-environmental attitudes and behavior; it also contributes to how people think their behavior will make a difference. Seeing other people doing the same thing helps people believe that individual behavior is not negligible. This connection which was not found in existing studies may result from the type of data that were usually collected for testing the models, when perceived social norms were measured only once and no variations could be seen within individuals.

Multiple reasons for recycling can come together to have a strong collective influence on people's recycling orientations. The example of Jenny illustrated how reasons for recycling evolved after moving to another country. Jenny recalled her first recycling experience after moving to Germany: she did not need to recycle before coming to Munich because her town in the U.S. would empty and separate the trash for them as she was told. Munich is quite different for her: "*So we came here, and it's to the opposite. If you don't recycle, you get fined; you can get into trouble, so you have to recycle everything*." The regulations and consequences appeared to motivate her most to start taking recycling seriously. When I asked her whether avoiding trouble is still the main reason she recycles now, she laughed after saying, "*I just think it's sort of interesting*." Then I asked why so, she replied:

> Everyday I'm wondering…oh, is that recyclable, or does it go to that pile or not that pile, so I just sort of learning the whole system to it. Somehow people magically know it, and I don't know it. So I just think, you know, just sort of figuring it out, who knows what, and how they learned it, and why they do it, and…so I think the system is kind of …fun and ja, I just think …it's interesting to learn. But I definitely have more awareness. **I mean, I don't feel like when I recycle plastic that I'm saving the world. But it's just something that everyone does, so I felt like, if everyone else does it, I should do it.** [laugh]. But I was always wondered…is it really saving the world? …. It just seems normal here. It's a normal thing to do. [Emphasis added]

Later on in the interview, I noticed that Jenny paid attention to lots of details when it comes to garbage—her engagement in waste categorization was more than usual. Jenny exemplified that engaging in recycling activities is not necessarily built upon pro-environmental attitudes. Strong social norms, even fun and the intriguing quality of certain activities can bind people to environmentally-friendly behavior.

As mentioned earlier, people's recycling behavior is often supported by several factors. Sometimes the various factors work well together, as in Karl's description:

> It's probably several dimensions. One is.. maybe somewhat the German heritage, when it was preached and taught of the behavior, backed up with scientific reasons, that it makes sense environmentally, and it can be done economically, so it seems like a logical thing to do. (Karl, N02)

But, at other times, reasons for recycling and not recycling compete with each other; it could be when laziness overrides pro-environmental values, or when social norms dominates inconvenience. In some cases, people did not act the way they thought they should do, and sometimes they could not even rationalize their actions. For example, Randy, an American scientist living in Munich, was acquainted with the details of industrial regulations in Germany for reusing recycled glass bottles. Recycled bottles have to meet significantly more strict rules than new bottles, which Randy found unfavorable for the environment: *"Environmentally it actually takes more….it harms the environment more because of the rules of washing out the bottle to recycle, to use water more than it does to produce the bottle in the first place... "*…. From the pro-environmental viewpoint, he believed it was not good for the environment but he still recycled accordingly.

To summarize, various reasons for recycling may work together or against each other in many possible combinations among different people in different settings. It is not always easy to assess how reasons for recycling and/or not recycling compete with each other and are translated into different actions. Yet, it is important to keep in mind the variety of influences on behavior that exist, cooperate and compete with one another when we try to understand why people recycle or do not recycle.

3.7 Beyond recycling

"Recycling" has become a symbolic expression for many of the environmentally responsible behavior, and sometimes people overlook the highly related but mostly ignored two other Rs: reduce and reuse. A few interviewees described how they reduced and reused some items, and they usually interpreted these actions as

compensating for limited recycling opportunities as well as getting closer to their environmental goals. This phenomenon occurred more frequently among the Germans interviewees probably because of comparatively limited recycling opportunities in New York City. For example, Karl mentioned reusing some non-recyclable goods like plastic bags[14] or containers: "*…I think that's one form of [environmental] consciousness that you can see for yourself; you don't need the city to tell you that products have more than one use*." While recycling relies much on city policy and available programs, reduce and reuse is more under their control.

When we talked about the not-uncommon struggles with recycling a plastic container but using extra water to rinse it, Lucinda shared her own way of prolonging the container life. She reused Greek yogurt containers to freeze the food she made ahead of time; after they had done the services, she would then use them for other things. The multi-using strategy helped her reduce waste.

Given that no municipal clothing and textile recycling program exists in NYC, Barbara put her unwanted clothes in a separate plastic bag, "*because I know someone will take them.*" She did the same thing for books, roller blades …anything that was fine but no longer useful for her, she would put up a sign right next to the stuff.

Even though reduce and reuse are not the main topic of the research, these thoughts and actions often reflect how participants react to insufficiencies and limitations of recycling and therefore help to add some depth in understanding people's recycling orientations.

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[14] NYC Plastic Carryout Bag Recycling Law passed on January 23rd, 2008, is no longer in effect and was replaced by NY State Plastic Bag Reduction, Reuse, and Recycling Act, starting January 2009. All my interviews were conducted before the law was effective.

3.8 Discussion

After the above elaborations on what, where, and when people recycle, I would like to suggest a new conceptual framework to display the complexity and dynamics of recycling behavior as an alternative view to traditional linear description of recycling frequencies.

Assessing people's recycling behavior typically involves asking questions like "Do you recycle?" or "How often do you recycle?" This thread of thoughts can be illustrated as a binary or 3 to 5 linear scale as follows:

No ----------*Yes*

Never ---------- *Sometimes* ---------- *Always*

These types of questions and answers consider recycling as one unified behavior. Even in some studies with questions about different recyclables, they tend to be combined, analyzed and presented as one dependent variable.

While the linear illustration is simple and clear, it is only a projection of a multi-dimensional behavior. For instance, Bad Doggie reported extremely different behavior when it involved different materials: he always recycled aluminum but never recycled paper. If we attempt to describe his behavior on a single dimension measurement, not only does it fail to capture the details, but it also gives a false description of "sometimes."

Paper **Glass- when deposit is involved** **Aluminum**

Never ---------- *Sometimes* ---------- *Always*

As discussed earlier in this chapter, material is not the only dimension that should be considered in people's recycling orientations. Location is another main contributor to people's variations in recycling behavior. People recycle differently depending on where the person is: at home, at work, or in public places. We can easily imagine that it adds more complexity to seemingly simple recycling behavior when location interacts with materials. A person may recycle everything at home but only recycle document papers at work. In the park, however, he/she may throw newspapers in general garbage cans but keep the deposit-carried beverage bottles with him for later redemption. The pattern can be illustrated as follows:

Park	**Paper**	**Cans & bottles with deposit**	
Office	**Plastic containers**	**Paper**	
Home			**All recyclables**
	Never ----------	*Sometimes* ----------	*Always*

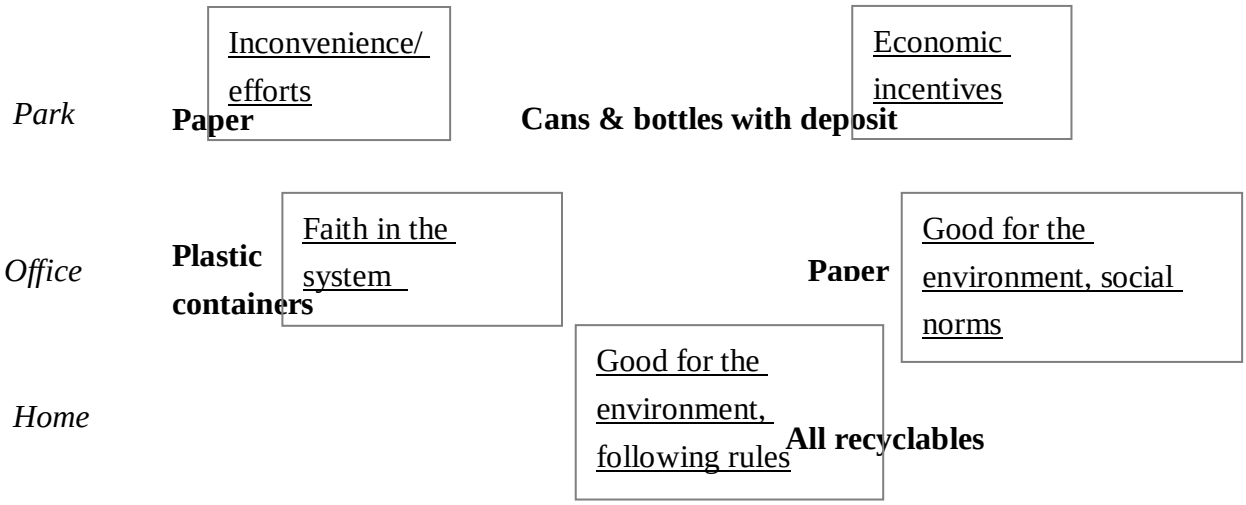
Finally, when we add temporal dimensions such as different seasons or different stage in life course into the picture, the illustrations can be considered as a series of three-dimensional patterns of frequency, material, and locations. Looking at how and what aspects of recycling behavior change over time will not only help us obtain a holistic and dynamic picture of a person's recycling orientation, but it facilitates the identification of and connection with various possible reasons behind the targeted behavior.

The above discussion is not intended to replace or devalue the common measurements of whether and how often people recycle but it is aimed just to clarify that those measurements do not fully capture the breadth and complexity of individuals. Research and policy on recycling behavior need to go beyond the discussion of individuals' psychological attributes including values, motivations, and to address recycling in terms specific contexts. It is important to consider different possibilities in which attitudes relate to behavior under different circumstances. For example, do people tend not to recycle larger, dirtier bottles when recycling containers are not nearby even when they have a moderate-to-strong pro-environmental attitude? When people move to a place where recycling is considered as a social norm, do they change their perceptions of how convenient or inconvenient recycling is? These questions are not just speculations but grew out of the research participants' stories and will be discussed throughout the following chapters.

Even though the different dimensions of recycling behavior (material, location, and time) were presented as if they were independent from each other, this is not the intention of the illustration. These simple diagrams were used with the hope of influencing that whenever we think of people's recycling behavior, we no longer just label a person as recycler or non-recycler solely based on a question or two; contextual data should be carefully included to get a full picture of what, where, and when and how people recycle, what their recycling history was, what their recycling patterns are now, and what the recycling potential can be in the future.

Similar logic can be applied to the discussion of the reasons for recycling and not recycling. Previous studies have tried to group various reasons and sometimes

connected them to different types of people yet the personal traits considered were usually out of people's spatial and temporal context. If we take the proposed multi-dimensional view of people's recycling orientations as described above, various reasons can be pinned to the different locations of the multi-dimensional plot. In this way, it becomes clearer how reasons are related to people-in-context instead of being isolated. Following the example above, I am plotting common reasons for recycling and not recycling in the tags attached to items in the setting context:



In the following two chapters, I will analyze and present how spatial and temporal factors intertwine with individuals' understanding and acting upon recycling as well as other environmental issues.

Chapter Four: Contextual Factors of Recycling

"When you make it easy for people, then there's no reason not to follow." (Karl, German participant living in Brooklyn)

"There's not a system in place that makes it easy like it is here [Munich] for people to recycle." (Virginia, American participant living in Munich.)

We live in social contexts that are composed of and intertwined with objects, texts and voices, people, and ideology. Some of these are visible, but not necessarily influential, like strangers we cross the path with everyday from home to work. Some are intangible, but constantly steering our actions, decisions consciously and subconsciously, like our parents' or kindergarten teachers' influences on the simplest daily habits: washing hands before eating, turning off lights before leaving the room. How do different contextual factors affect the way we think and the way we act? Perhaps we take active roles to explore and navigate through different layers or domains of contexts: the physical environment we live in, perceive and act upon, the social environment that we engage in and interact with, and the political, cultural background that quietly breaks us through.

Recycling, like many other social behaviors, can be and should be considered in its context-- or a system of contexts which I will elaborate on later. This chapter will look into different dimensions of contextual factors and analyze their influences on people's recycling behavior, with focused discussions comparing Munich, Germany with New York City, USA. In addition to semi-structured interviews, I also used

observations, photos, and archives to compare and contrast the two research sites.

4.1 Affordances

After displaying multi-dimensional orientations of recycling thinking and behavior in the previous chapter, the focus of this chapter will be shifted from *people* to *places* with a closer look at the concept of affordances-- more specifically, what I named "recycling affordances." I will also investigate how recycling affordances are formulated at different levels, how they are perceived by people, how they act upon and penetrate people's environmental orientations, and how different contextual factors relate and interact with one another.

James Gibson's concept of 'affordances' refers to the possibilities of uses that an object provides when an organism actively explores those functional properties of a particular object (Gibson, 1979). Objects carry different physical properties functioning as cues or providing possibilities for actions to take place. Even though the term is associated with objects, affordance should be considered as the interface where the interactions with people take place, thus the affordances can vary when different actors are involved. For example, a three-foot high platform can easily sit an adult but not a two-year old child. The differences do not reside solely in physical build but also in people's preexisting knowledge and cultural backgrounds. Harry Heft broadened Gibson's framework by proposing a synthesis with Barker's behavior settings (Barker, 1968). Heft (2001) regards affordances as a component of behavior settings and recognizes that specific affordances are often embedded in particular behavior setting

In order to link recycling behavior with Gibson's own definition of affordances, I would like to emphasize two crucial parts of his theory: the "functional properties" and

"active exploration." The two parts are interdependent: the possibilities of uses will not occur if the organism does not explore and perceive the properties of the object nor if the object does not provide any functional properties. Even though affordance is mainly used to describe the relationship between an organism and the object, this concept can be applied to the relation between people and the broader environments. If we subsume "the possibilities of uses" to "possibilities of recycling," affordance can then be explained as: the possible use that the environment provides when people search for or recognize ways to recycle. Gibson does not see people as passive information receivers; rather, he stresses the importance of our ability and tendency to actively explore and perceive ourselves in the surrounding background. The theory of affordances is valuable for understanding the contextual nature of recycling for two major reasons. The first reason is to recognize that the concept of affordance captures well the interactions between people and objects along with explanation of the usability. There many objects involved in the process of recycling: different kinds of household waste, garbage and recycling receptacles; affordances theory provides a dynamic perspective to examine both the human part of active exploration and the objects part of functional property. The second reason is the ability to emphasize contextual factors of recycling through Heft's assertion of affordances as elements within behavior settings. Heft considers social and cultural elements in order to fully understand how affordances work on human beings (Heft, 1989, 2001.) Heft's broader, ecological version of affordance theory is valuable for understanding recycling because it recognizes the importance of multi-dimensional and interrelated environmental contexts[15].

[15] There are some on-going debates about the definition and use of affordances theory in the field of ecological psychology—they are largely philosophical and focus on the nature of perception. While the

In the following sections, recycling affordances are discussed at different yet interrelated dimensions: physical, informational, social, political and cultural environments. The analyses draw upon both people's descriptions and interpretations of recycling opportunities as well as descriptions of obstacles they perceived and experienced.

4.2 Physical environments

As the most tangible and immediate level in the system of recycling affordances, physical affordances can be defined as the appearances, properties and features of objects that support recycling behavior. Physical affordances for recycling include but are not limited to: the material and design of objects[16] such as receptacles, as well as labels, stickers or icons attached to recyclables and waste containers. Physical affordances function as reminders, trigger the last minute behavior change, and sometimes make the unplanned recycling happen or vice versa (discourage the intended recycling behavior from happening.)

Compared to the volume of research that has investigated people's pro-environmental attitudes, beliefs and knowledge, very few studies have examined how physical affordances influence people's recycling behavior. The majority of the studies related to physical affordances focus on the shape, design, and availability of recycling containers (Burn, 1991; Geller, 1985; Katzev, Blake, & Messer, 1993) For example, Geller and examined how shapes of containers can influence recycling behavior. They

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abundant discussion on affordances theory is acknowledged, the details of the debates are not the main concerns in my study. Affordances theory is used here as a framework especially for the perspective of affordances as a relation between objects or environments and the organism.

[16] For details, please refer to 3.3.2: mixed types of material in the previous chapter that discussed about designs of objects for recycling.

found that specially designed waste receptacles (bird-head shaped containers were used in their study) attracted more people to recycle (Geller et al., 1980). Similarly but more specifically, a more recent study found that specialized lids on waste containers could influence recycling behavior. The existence of the lids did not only dissuade people from putting regular trash into recycling containers but also prevented people from discarding recyclables into garbage cans (Duffy & Verges, 2008) The authors argued that specialized lids (with three distinct openings for general garbage, glass/aluminum/plastic, and paper) nevertheless provide more effective affordances for recycling compared to labels alone on containers since labels may not be prominent on the containers, may fade away or tear, or may not be understood by non-native speakers.

Most of the previous studies showed how the waste receptacle design affected recycling behavior. Not surprisingly, those studies were mostly conducted in public spaces. Compared to home environments and workplaces, physical affordances are more important in public space. Because waste receptacles are not chosen and arranged by users themselves, the design should be more distinct so that people can minimize their cognitive efforts in determining the correct containers for their garbage. However, even though we now know some special designs have great potential to increase recycling, hardly any studies discuss how perceived affordances work in a system. For example, it is not difficult to imagine and hypothesize that well-designed, effectively recycling-afforded waste receptacles alone cannot make recycling behavior happen, if the containers are located in a hidden place or simply out of the common route where necessary waste disposal behavior takes place.

One example of good physical affordances for recycling is the four-compartmented

waste receptacles at different locations in Munich (see Figure 12.) When people dispose of something, they have to make a choice of which compartment to throw it in- unless they dismiss it completely. The arrangement displays a certain consistency of the recycling system. As shown in the picture, those recycling containers provided by Deutsche Bahn (the national rail road company in Germany) are universal in all railroad stations in Germany. The compartments themselves also match the common garbage-categorization scheme (shown in Figure 8 in Chapter 2) throughout the nation.

Figure 12: Four-compartmented recycling and waste bins in subway stations in Munich. From left to right: Restmuell (general garbage), Verpackung (plastic packagings), Glas (glass), Papier (paper).

The consistency in waste categories across settings helps people maintain their recycling behavior in different places. In contrast, people can only find generic black garbage cans in New York City's subway stations (see Figure 13). When one finishes reading a newspaper, or finishes a bottle of water, only two choices are there: either to carry them around until a proper recycling container is available, or to dispose them just as garbage[17]. The inconsistent waste disposal system made it difficult for people in New York City to establish a scheme when dealing with their garbage. Lacking proper recycling bins in public spaces also frustrated many of the German interviewees in NYC.

Figure 13: Single and huge black waste receptacle in New York City subway station

[17] Only recently, a sign started to be attached in some of the garbage cans in the subway system, indicating post-collection recycling efforts. This kind of message, on the surface, may seem to be encouraging environmentally responsible behavior, but could easily serve as a confusing message for home-recyclers; people may wonder: if post-collection recycling can be done, why do we have to separate our garbage at home?

Good physical affordances function beyond being the frontier of recycling behavior- they further become indications of political/legal representations and cultural ambience for recycling In the example of ubiquitous recycling containers in Germany, physical recycling affordances do not only make the behavior itself possible, more convenient, but also concretize the policies and reinforce cultural influences.

John, a German participant residing in Brooklyn talked about how different domains of recycling affordances- especially physical and informational, including the designs of the compartments, the consistency across different locations, the information contained in the pictures…etc. – work together and consistently in Germany:

> I mean, all train station, subway station… I don't know about bus stop. Even some bus stops, they have it separated out at least into ..Grüne Punkt, you know, yellow bin. That I remember they did it. In the train station there are those round ones with three different openings. And they have those pictures on them to show what you're supposed to throw in. 'cause when you just asked me about the recycling, I saw the picture….**I can recall the pictures of those round trashcans, three openings, and I don't see it here. But in Germany they're kind of all over the place, especially in train station and subway.** … The university was good. Especially if they want to teach us. They were very.. .progressive." [emphases added]

Differences in physical recycling affordances are most salient in public spaces but they are also evident in the home environment. Compartmented waste receptacles are more commonly seen in Germany than in the United States. The two pictures in Figure 14 were taken in Germany to show the common appearance of compartmented waste

receptacles. Figure 15 shows examples of German interviewees' ways of organizing different recyclables.

Figure 14: The left and right pictures show different compartmented waste receptacles from two different interviewees' homes in Munich

Figure 15: Examples of mixed use of bags and containers for different categories of waste. The two photos were taken from two separate homes of German interviewees in NYC.

Figure 16: (Left) NYC launched its plastic recycling program in 2007 and these are almost the only recycling containers existing in most commercial places. (Right) A typical supermarket store in Munich where customers can recycle different categories of waste.

interventions. The former includes discussions such as social pressure and social norms and the latter involves social marketing or various techniques of persuasion (e.g.: (Burn & Oskamp, 1986; McKenzie-Mohr, Smith, & Smith, 1999; Mee, Clewes, Phillips, & Read, 2004) In combination with the literature mentioned above and the empirical data from interviews, the social dimensions of recycling affordances can be defined as affordances generated, strengthened, eliminated or destroyed via social channels. The consideration of the social dimension as a contextual factor is different from what we more commonly refer to as social norms or social pressure is that the former includes social aspects more than norms and pressure. Social environments that affect recycling behavior include:

1. Social norms: when people perceive recycling is the right and socially appropriate thing to do. Social norms can also work against recycling, when it is not a common or expected act in the group.

2. Means of channels for knowledge and information communication. People acquire and convey various pieces of information through social connections which may raise or reduce environmental consciousness, increase or decrease practical knowledge (such as where and what to recycle), or provide related information that may alter people's decisions on recycling (such as sharing the experiences of getting a recycling summons.)

In addition to the day-to-day, face-to-face interactions, social dimension of recycling also exists in a word-of-mouth, myth-like virtual form. Throughout my research, several American participants mentioned a similar urban legend which they had heard and to some extent believed: *if people sorted their trash inappropriately or recycled in a wrong way, their German neighbors will knock on their door and correct their way of separating garbage.* Mentions of the story usually occurred after I asked them what would happen if they do not recycle. When I followed up with the question of whether they have ever really encountered that situation, the answers were universally no. However, the perceptions of possible blame from German neighbors showed the social enforcement of recycling practices: the sense of being punished is likely to be the implicit motivation to comply the expected behavior.

Virginia recalled the way she learned all the recycling regulations after she moved to Munich:

> I guess through my neighbors and friends, and also watching them, you know, having dinner at their homes and seeing them..oh well, there are all these other bins. Then I walked in the neighborhood and saw..,, wow, they are on the street. And I think Europe as a whole seems to be more conscientious about the

> environment, things like that. It's just a different mindset. I think differently here. I always have thought a little bit differently in the States, like when my sister using paper towels for everything, I'd say, "here's the cotton towel, keep using those." **But here, there's something different. There's some sort of social responsibility that I seem to feel here**. It's not exactly recycling, but to use it as an abstract, for example, the escalators don't run 24 hours a day. When you step on the plate, the bottom plate, it starts the machine. (M03, Virginia, emphasis added.)

We can see clearly through Virginia's words how her social network in Munich helped and influenced her thoughts and behavior of recycling and beyond. She also mentioned the entire cultural atmosphere (which will be discussed more in section 4.5) along with other setups that made her feel the environmentally-friendly atmosphere.

As mentioned briefly in the previous chapter (3.6.1A), following social norms is one of the main reasons for people to recycle. It can be even more evident for people who migrate to another place, as they tend to learn new things and blend into the host country. Melanie again shared her view of garbage disposal from a foreigner's perspective: "*I think people just have more open attitude, and since…. With the separation of trash and things, it's just…. Everybody does it. You tend to follow that as a foreigner.*" (M29, Melanie)

The two examples above are Americans moving to Germany; both are examples of how the social environment works in favor of recycling. However, social expectations and interactions do not always result in positive social affordances in recycling. On the contrary, they may instead reveal the lack of environmental consciousness, represent

different norms, and can be quite discouraging. Sabina talked about her experience after a party at a friend's place, when other people tended to throw everything out together:

> ,…a lot of people don't know! It happened to me…I was like "so we throw everything together?" and they were like "why not?" and I said "some things have to be separated," and they're like "really"? I think a lot of people are not aware of it, or even they're aware of it, they resist recycling, or sometimes they just don't care. It's easier just to throw everything together. But definitely I think most people…all the people I know from Europe they all do recycling. It could have been there many years already- it's part of how we were growing up. [N06, Sabina]

Kai also shared similar observations that people in the U.S. do not talk about environmental issues as much as in Germany:

> Here, you don't have that initial effort. Obviously, everyone here talks about the war in Iraq, because that's something in the news, that's something people talk and care about, but you never see any kind of efforts on environmental issues, you know, like global warming. [N04, Kai]

Hejo contrasted his experiences in Germany and in the US regarding different social environments influencing recycling. In Germany, people in his neighborhood seemed to be very aware of environmental issues and sometimes, as he said: *"it can come to an extreme situation*." The example Hejo gave was that people would take off the staples on a tea bag, then put the staples in the metal recycling pile, paper label in the paper recycling bin, and used tea bags into compost. Apparently "*not everybody* [does so]", he continued, "*but there are groups, they are very aware about this. And if you are*

in such an environment, then you have to do it."

4.4 Political environments

Recycling in psychological studies is mostly researched through the lens of pro-environmental attitudes and behavior, while its political and economic aspects are overlooked. A few related foci on this area are often limited to the individual level, for example, relating people's political orientations to their environmental thinking and behavior: some research found that recyclers tend to be more politically left-wing or liberal (e.g.: (Neumayer, 2004; Olofsson & Ohman, 2006). A similar situation applies to economic factors. For instance, income was reported as a predictor for recycling in some studies (Clark, Kotchen, & Moore, 2003; Schultz et al., 1995; Vining & Ebreo, 1990) but relatively few studies touched upon economic factors in a larger context such as at the community, city or the country level. Meanwhile, demographics alone do not yield consistent results: some other studies found no connections between political orientation and recycling behavior (Derksen & Gartell, 1993; Gamba & Oskamp, 1994). Political and economic factors were mainly treated and examined as demographics (considered as individual political orientation and economic status) rather than as contextual factors. In other words, we do not know much about whether and how the political environment in a society influences recycling behavior. For example, are people more likely to recycle in a country where political decisions are made with environmental issues as one of the top priorities and environmental policies are valued and advanced? If so, does the political environment influence people through ideology, via practical setups (such as having widespread recycling locations) or combinations of both or more?

Throughout the interview processes, comparisons of political differences between the two countries were often brought up by the interviewees, with direct or indirect influences on their recycling practices. Related topics included contrasting governmental approaches to environmental issues in the two countries, different recycling policies, manufacturers' responsibilities and disparity in political ideologies in people's everyday life. In this section I will explore and discuss how the political environment helps encourage or discourage people's recycling behavior.

As illustrated in Chapter Two, recycling policies and regulations are different at both the city level (Munich versus New York City) and the country level (Germany versus the United States.) When the policy is consistent from local to national, it helps create a scheme for people to recycle consistently

> I think it's [the recycling program] the same, all over Munich. you know, the three, four garbage cans, you know. Just sort the garbage in. ya, it's pretty good. I think it's pretty convenient too. You can almost go to any kiosk, or any little store, or big stores they have the actual machines. And I can bring in a random bottle that I found on the floor. You know, any place would take the bottle, if they sell the bottle. **You know, it's not like I have to drive half an hour to find some random place to take those bottles back. So I mean, it's really widespread, in the culture**. (Greta, M09, emphases added.)

Advanced recycling policies and aggressive environmental laws not only make recycling easier for its direct effects on facilitating behavior itself, but also help in shaping an overall impression that recycling is taken seriously, which certainly encourages people to recycle. It also forms the public value that the government

supports and reinforces. As demonstrated in earlier chapters, environmental legislations like the Package Ordinance in Germany and the suspension of the recycling programs in New York City formed great albeit contrasting impacts upon people.

Both Americans and Germans talked about New York City's two-year recycling suspension[18]. People described the suspension mostly in negatively terms such as "*a bad joke*", "*short-sighted*", "*ridiculous*", "*the problem of capitalism*"…etc. David commented on the suspension and attributed the decision to capitalism: *"That's the other problem about the capitalism. Even it's the right thing to do, they won't do it if there's not money for it. Everything has to do with money. Irritating, ah?*" (M12 David, 12:23) As in any politics, priority is always an issue; how we decide to allocate budgets reflects what we value:

> Sure it costs money. Because you have to have people pick up the stuff, you have to have people separate this…whatever, but I mean, isn't it worse more than have a bad environment? I mean, the government is willing to spend millions on rocket testing. And I think, you know, for me it's a bad, bad joke. (Abel , 17:36)

Other people also considered the suspension to be myopic and pointed out that the long term costs were not taken into account in the decision-making processes. For example, Cassie mentioned future costs and thought it would be more expensive in the long run which echoed Hejo's concerns: "*I simply don't understand it. In the end, it's going to be way more expensive. Why do we want that?*" Meanwhile, Lisa shared similar comments:

Well, I think that's short-sighted, and I think you have to think about what's the

[18] More details on the two-year suspension can be found in Chapter Two, section 2.4.4.

> long term cost of not recycling. You know, the cost to the planet is not easily calculable in dollars, perhaps, in immediate term, but …eventually, that can be costly to suspend such a program for a couple of years. (M30, Lisa)

The effects of the suspension were not limited to the two-year time span; this event created distrust in the government, which is connected to reasons why people do not recycle (more discussions are in the last chapter: 3.6.2A.)

Other politics-related discussions centered on the relationship between governments and people. Related to the rule-following cultures mentioned earlier, a few participants contrasted the environmental politics in Germany and in the USA. Recycling and garbage-sorting may be regarded as individual behaviors, or as collective actions. It is debatable whether and how much the government should be involved or even intervene. Sebastian moved to the U.S. about three and half years ago, long enough for him to "*understand these American minds".* He continued commenting:

> There's something that I think many people here would argue, [recycling] is a personal decision: whether you separate your garbage, whether your recycle or no, no one should tell you what to do, especially it costs money. So of course there are some concerns for it, but it's the first thing that you cut the money on, because it's kind of an unclear thing that whether the government should take on it….(Sebestian: 33:41)

Sebastian's words demonstrated an interwoven relationship between government and individual- while household waste is in the private domain and garbage contents are considered private, recycling in some places and garbage collection in general are public services. Categories and frequencies for recyclable pickups depend at least partially on

operational costs and operational costs are influenced by the recycling rate[19].

Meanwhile, the Green Party (The Greens, *Bündnis 90/Die Grünen)* was often mentioned as an immediate response when people tried to explain Germany's advanced environmental regulations. Emerging as a grassroots political body against nuclear power, the Green Party has made major policy efforts including instituting carbon taxes on fossil fuel use to promote conservation and renewable energy and phasing out of Germany's nuclear power. Even though the Green Party appears to be a reasonable explanation for Germany's progressive environmental policies, it does not explain its influential powers. From another point of view, the strength of a political party that cares for environmental issues can be seen as a product or evidence of its citizens' collective power. The Green Party has emerged later and is steadily growing in the United States but its contribution to altering environmental legislation is in no way comparable with its counterpart in Germany.

To sum up, the political environment and policies influence the quality and convenience for recycling in both attitudinal and behavioral aspects. More intensive recycling policies in Germany along with a government committed to environmental issues shape the political environment that has made recycling not only possible but also encouraged. In contrast, even though recycling programs are growing in New York City, the history of its suspension along with a lack of progressive environmental legislation in the U.S. forms a different political environment that makes recycling not encouraged. Based on people's different recycling experiences in different political environments, perhaps it is worth to investigate what kind of policies and political interventions would

[19] According to the EPA's (Environmental Protection Agency) study in 2001, the cost of recycling per unit declines when the diversion rate (recycling rate) is higher.

foster environmentally responsible behavior in the future.

Figure 17: Bottle deposit is 5 cents in New York (left), while it is 10 to 25 cent plus 3 Euro for the crate in Munich (right)

4.5 Cultural environments

"Culture" implies different meanings; it refers to an integrated pattern of knowledge, belief and behavior dependent upon the capacity for symbolic thought and social learning, or represents the set of shared attitudes and practices that characterizes an organization or group. In this section I use the term "culture" to represent shared values and lifestyles; by looking at the cultural dimensions of affordances, I will investigate how people's environmental consciousness and recycling behavior are cultivated via shared values and lifestyles. The cultural dimension is closely connected with other dimensions discussed in earlier sections: social interactions and expectations can be regarded as an inherited culture of the locality; the physical dimension can be seen as a product of the existing lifestyle; shared environmental values also reflect on or are reinforced by progressive recycling policies. This section demonstrates some of the

overall cultural influences that were recognized by many participants—many of which go beyond the boundaries of more specific physical, social, and political dimensions discussed earlier.

When I talked to people about my research on recycling in Germany and in the US, I got quite a few comments similar to "*of course Germans are doing better."* The general impression seemed to be a mixture of perceptions of Germans' better environmental consciousness and the mindset of being (sometimes obsessively) organized and following rules[20]. There are probably more stories behind the seemingly stereotypical rule-following or greener mindset that is worth further exploration. What are the different cultures in the two countries that were perceived by people who lived in both places? How did they connect their own recycling thinking and practices with the embedded cultural environments? Does Germany encompass a better "recycling culture" than the USA?

In Pajo's in-depth, anthropological research, she argued that recycling cultures and contemporary environmentalism in Germany emerged as more than a response to environmental distress such as pollution and environmental disasters, but was articulated through social transformations that followed political and economic reunification in 1990. She concluded that "recycling has moved beyond environmental laws and technologies, well into the domain of culture." (Pajo, 2008, p. 270)

The Pfand (deposit) system in Germany is implemented much more extensively than the similar but minimal bottle deposit system in the eleven states in the USA. The

[20] Please also refer to 3.6.1 D in the last chapter about following the rules as one of the reasons for recycling.

differences contrast the cultures and represent the collective lifestyles of the two places and were easily detected by those who moved from one country to another. As a result, many American interviewees were amazed by the German deposit system. One of the most mentioned features is the glass and flatware deposit system commonly used in some student restaurants and all public events. It represents a lifestyle and cultural expectations (please see Figure 18).

Figure 18: Germans use real glasses and utensils in public events or street fairs, with consumers paying a deposit (2-Euro deposit per glass, as shown in the photo.) The deposit will be given back when people finish the drink and return the glass.

How did people perceive and interpret such different general environmental atmospheres? "Mentality", "social responsibility", and "environmental consciousness" were all given as examples people provided when they compared the differences between Germany and the US. Some of them are seemingly stereotypical: Germans are collective, rule-followers, and more environmentally conscious, while Americans are individualized, liberated and more consumer-oriented. Sometimes the comparisons

went beyond Germany: Europe instead was used in comparison with America. For example, some American participants commented that Germans or Europeans are "*more conscientious about the environment*," and have a different "*overall social consciousness and responsibility*" (M03, Virginia) and "*having much stronger recycling laws*" (M01 Bad Doggie.)

In contrast, when I was interviewing Germans in New York City, I was rather amazed by the number of people who actively mentioned the over-abundant supply of napkins in NYC as an index for wasteful American culture, usually with a more or less angry intonation. For example, Stefanie (N10) described: "*if you bought something for lunch or something, you always get 20 napkins. Why do I need 20 napkins? You know what I mean, so those things were irritating me."*

Strong environmental consciousness in Germany is widely perceived by American interviewees who moved to Munich. Even though it is not always clear to them how the general consciousness is developed, cultivated, and sustained, similar impressions were repeatedly expressed in interviewees' narratives:

> Here, I have no idea how long it has been going on, recycling. But I got the sense that everybody knows that recycling is a good thing. They have a positive image about recycling. They have a positive image about saving the environment. In the States there isn't a positive image about that. It's all politically motivated, negative images. You have to find out the psychology of why that is. Tell me, I'd like to know, how the protection of earth, suddenly become the communistic,

social-liberal things. That's the thing actually on the States, from a lot of people who just don't care. (M03, Randy)

Research participants made a few small yet prevailing contrasts in everyday life of the U.S. and Germany that they connected with pro-environmentally sound practices. One common comparison people often mentioned related to waste production is reusable shopping bags. In Germany, consumers have to pay extra money for plastic bags[21] so at least partially due to the monetary incentives, most people bring their own cloth shopping bags (please see Figure 19) or use spare cardboard boxes in the stores[22].

Figure 19: (Left) NYC shoppers are commonly seen walking out of stores with several bags in hand, and they are usually double-bagged. (Right) People in Munich bring their own shopping bags, usually cloth bags that are reusable.

[21] The price of plastic bags depends on both the store and the size of the bags, usually 10-20 Euro cents per bag.

[22] In most places people can take the empty boxes in the supermarkets and grocery stores, usually near the entrance or checkout area, that can be used to carry purchased stuff.

In addition to reusable bags, there are many other daily life experiences that prompt people to be aware of and possibly adopt an environmentally-friendly lifestyle that is related to but goes beyond recycling and waste management. For example, Virginia, among other American interviewees who noticed the less-common uses of clothes dryers in Germany; this phenomenon made her re-think the necessity of using energy. Automatic off light switch in many buildings and automatic off power and direction switch in Munich subway escalators also made Virginia (among other American participants) more aware of energy use and environmental issues.

4.6 Information

Information can refer to the communication or reception of knowledge or intelligence; it closely incorporates yet is not identical with physical affordances. If we conceptualize information as a dimension in affordances, it can be defined as the available information that makes people aware and capable of recycling. Information is created and distributed in different forms, including verbal, gesture, texts, photos, diagrams, *etc*. Some are stationary and attached to objects, such as flyers and labels on the recycling receptacles, while others are more fluid, like public service announcements on TV or radio, or words of mouth from neighbors and friends.

Iyer and Kashyap (2007) divided information into two related concepts: *communication* and *knowledge*. Their research compared the effectiveness of increasing recycling behavior by giving monetary incentives versus providing recycling information. They found out that even though both approaches boosted the recycling output at beginning, it declined after a 6-week period. Yet the effect of providing information seemed to last longer in improving recycling rate than giving incentives. Even though

both incentives and information had declining results as time went by, the degree of decline in information was lower. Iyer and Kashyap's study makes clear the importance of information for effective recycling behavior. However, their study along with other similar studies, did not explore the different ways and processes in which information influences people's perceptions of and decisions about recycling and other environmental issues. Some data that emerged from my interviews could shed some light in this area.

At the most basic level, information helps people to acquire and sustain the concrete and necessary knowledge as to where, when, and what to recycle. Available information is especially important for people who just moved to a new place—the relocation might be as micro as to a different neighborhood in the same city or as macro as to a different country. At a less direct yet no less significant level, information can moderate people's perceptions of and decisions about recycling behavior. As discussed in the previous chapter (section 3.4.4), when people heard that recyclables often ended up in landfills, it easily triggered distrust and frustration towards recycling , thus affecting the motivation for recycling negatively.

Informational affordances often work together with but are not limited to physical affordances. Virginia mentioned that the pictures on recycling bins provided necessary information for her to recycle properly, without her having to master a foreign language, "*Even if you don't know the language, there's a picture on it that shows you glass, shows you paper, and shows you what is really trash that can't be recycled. So it's very easy.*" (Virginia, M03)

Consistent symbols also help people recognize recyclables. For example, Germany's Green Dot symbol on products provides a consistent message of what are

recyclables in DSD programs, whereas a similar recycling symbol in the United States does not mean those products can always be recycled, since recycling programs vary a lot from one place to another. Therefore, the tri-arrow symbol can be misleading or confusing because it usually implies recycling.

Information and knowledge acquisition can occur actively or passively. People tend to actively look for information when they care for one thing more than for another, or when there are enough motivations to take action. Presumably, people with higher environmental consciousness are more likely to actively seek appropriate recycling locations, to make sure garbage is correctly categorized, and to be more attentive to recyclable collecting days. On the other hand, good information affordance in the environment, preferably well integrated with people's behavior settings, is more important for those who are unlikely to look for information.

John and Kati's experience exemplified the integration of informational affordances with behavior settings. When they first moved to Poing[23] in 1998 and registered at the town hall, they had to go meet the recycling specialist, who informed the new comers as to where things can go. They went home with charts and papers explaining recycling regulations. In this case, information went to them before they even needed to look for recycling regulations. The American couple's experience of being oriented to recycling mirrored Karl's comments and suggestions for possible channels of information conveyance:

…it's [recycling] really a public policy issue. For example, every time we moved,

[23] John and Kati live in Poing, a small community about 12.89 square kilometers in size, 18 km east of central Munich. They are not included in my focused sample of 25 people, yet their experience was shared here because of its uniqueness and great policy implications.

> we asked the post office to forward the mail. And you know what usually happened is, when you received the conformation from the post office, think about it: **it always comes with some other promotional materials like Home Depot, and they know this is the area that you'll live in. But you never see any garbage information, or anything like, ok, these are the pickup days for garbage in your neighborhood.** But you definitely know where is the closest Home Depot, how to order your phone, among other things. This can be done. If you make an effort to inform people where is the closest Home Depot, the Sanitation Department can do something like that, right? [Emphases added]

Even though I am not sure whether Karl's ideas grew out of his previous experience in Germany, it is clear how people see information provided to newcomers as indicators of efforts made. From the two stories we can see that what seems to be the default in Germany is not necessarily guaranteed in the United States.

4.7 From affordances to realities

Affordances are more about *possibilities* than about *realities.* Even though the examination of different dimensions of affordances in the two cities from photos, observations and the interviewees' words all pointed out that Munich and Germany seem to afford recycling better than New York City and the USA, it is worthwhile to take a look at recycling rates in the two places. Unfortunately, cross-country and cross-city recycling comparisons are not as easily accessed as they could be. There are different ways to determine recycling (or "waste recovery") rates, measured by different institutes in different years…*etc*. From the available sources, there seem to be some differences in measuring city level and country level recycling rates. Therefore, the numbers

provided below may not be perfectly comparable with one another, but should be treated as a reference. At the city level, the recycling rate is 40.39% in Munich[24] against 16.2% in New York City[25]. At the country level, Germany's recycling rate is 66.27%[26], double the rate of USA recycling: 33.07%[27] . It is clear that at both the city and country level, Munich/Germany has a much higher recycling rate than NYC/USA.

Comparing recycling rates of the two research sites provides us with the background to summarize different contextual factors:

1. *Recycling affordances in Munich are much stronger at all different levels: physical, social, political, cultural and informational.*

At the physical dimension, recycling behavior is better supported in Munich than in New York through the clear design of recycling bins and systematic categorization among different locations. Social support for recycling was perceived consistently as stronger in Germany. Moreover, progressive environmental regulations in Germany provided people not only with easier ways to recycle but also create a positive image of all sorts of environmentally-friendly behavior. Moreover, a commonly perceived "recycling culture" in Germany encourages people to recycle and to be more aware of environmental issues.

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[24] Data retrieved from Munich City Government report: http://www.mstatistik-muenchen.de/themen/umwelt/jahreszahlen/jahreszahlen_2008/p_jt090903.pdf. Numbers are from the year of 2008 for household waste not including commercial waste.

[25] Data retrieved from NYC government website (http://www.nyc.gov). Numbers are curbside and containerized recycling diversion rate (%) from 2008. The rate declined slightly for the past two years: 16% in 2009 and 15.6% in 2010.

[26] Data retrieved from Eurostat: Statistical Office of the European Communities. (http://epp.eurostat.ec.europa.eu/) Percentage recycled is combined of recycling and composting. Data was from the year of 2008, and was published in March, 2010.

[27] Data retrieved from EPA report: http://www.epa.gov/osw/nonhaz/municipal/pubs/msw2008data.pdf. Data presented are recovery rate of municipal solid waste, which refers to recovery of postconsumer wastes and does not include converting/fabrication scrap.

2. *A single dimension of recycling affordance cannot work alone to support recycling; the entire system has to work together.*

For example, although the recycling program is not only available but also mandatory in NYC, inadequate social affordances can still discourage people from recycling. Even for a person like Sabina with pro-environmental attitudes and abundant knowledge of recycling, NYC's negative social affordances formed a barrier for her (please refer to section 4.3 for details).

3. *Contextual factors influence both attitudes and behavior of recycling; the influences may weigh differently based on recycling behavior in its specific material-space-time.*

Continuing the discussion at the end of the previous chapter, people's recycling behavior should not be seen as a single dimension; it should be regarded in its material-place-time context. In this respect, different contextual factors may influence recycling behavior differently depending on its specific space-time. As already mentioned in the last paragraph, negative social environment influenced Sabina's recycling behavior in her friends' places but not in her own home, because she could practice recycling at home by herself but she did not have the same control to do so at her friend's place.

Table 4 summarizes different dimensions of recycling affordances in the two research sites.

		Munich/Germany	**New York City/USA**
Recycling Rate in 2008		Germany: 66.27 % (Munich: 46.44%)	USA: 33.07% (NYC: 16.2%)
Waste Generation in 2007[28]		Germany: 580 kg/capita	USA: 760 kg/capita
Waste Management System		Mixed pick-up (3-bin: paper, biodegradable, & regular garbage) & drop-off (5 different bins for glass, packaging & metal.)	Pick-up, 3-bin system (1 for regular garbage, 1 for mixed paper recycling, and 1 for metal, plastic, and glass recycling)
Physical			
	Home	Compartmented containers are more common.	Compartmented containers are uncommon. Most people improvise with different containers, bags, and/or mix with different locations at home for categorizing garbage.
	Neighborhood	Containers for glass, metal and plastics	None
	Commercial spaces	Stores are equipped with containers for packaging and various recycling.	None (very limited items started only recently: plastic bags and batteries)
	Public places	Compartmented bins for various recycling	Non-existent before. Recycling container in limited public spaces starting 2007. ("Public space recycling pilot")
Social		• Seeing other people recycle encourages them to do the same. • People believe the neighbors will interfere if recycling is not done properly. • Recycling is universal across different neighborhoods.	• Recycling is not regarded as default behavior. • Some people became sloppier in recycling because "no one seems to care." • Some neighborhoods/blocks in NYC are more recycling-aware than others.
Cultural & Political		• Environmental consciousness is highly regarded in Germany. • Packing Ordinance: manufacturers and retailers are responsible for packaging recycling. • Green Party has made efforts on environmental policies.	• USA is often regarded as a wasteful country by research participants. • NYC suspended parts of the recycling program to save money between 2002-2004 with lasting effects on people's attitudes and practices. • Fewer discussions of environmental issues in mass media.

Table 4: Summary of different dimensions of recycling in Munich/Germany vs. in NYC/USA.

[28] OECD (2010), *OECD Factbook 2010: Economic, Environmental and Social Statistics*, OECD Publishing. doi: 10.1787/factbook-2010-en

4.8 Contexts as a dynamic system

The physical, social, political and cultural environments afford people's recycling attitudes and behavior in various ways and provide different channels for related information. These contextual factors are also related to one another: political dimensions often translate into physical affordances; social dimensions in a larger and longer-term perspective can become cultures and ways of life. In addition to these imaginable links, how do different dimensions work together or against each other? What are the possible ways to illustrate the relations among various contextual factors and how do they come together to interact with people's recycling attitudes and behavior?

Good recycling affordances do not depend just upon one dimension irrespective of better information provided, greater social norms, or more thorough recycling and refund policies. The different levels of affordances work together as a system to stimulate people's environmental awareness, to incentivize people to participate in recycling, to help people establish and maintain the habits. Clear, constant, and convenient prompts and reminders added levels of consistencies to the web of recycling affordances. The system of affordances was well described by many participants, albeit using a different vocabulary. For example, even though Melanie attributed her recycling behavior as mostly money-oriented, she acknowledged the interwoven web of recycling programs, social pressures, other healthy lifestyles…into one attribution of place and people: "*it depends on where you live.*"

> It's the lifestyle…. It depends on where you live. If you live in a place where people all recycle, you have more social pressure to do it, then you do it. Like in the US, if you live in a community, where they offer recycling, and you see your

> neighbor doing it, and everybody is doing it, then there's more social pressure. (Melanie, M29)

Not only American interviewees perceived the well-integrated system of recycling affordances in Germany; some German participants also offered similar views in retrospect, after they moved to the United States:

> It just made obvious that it [recycling] can be done, and should be done. You would see the poster, you'd see other people doing it, and when you go to the supermarket or any place, you take the train in Germany, you see there they have 5 different bins, and it's just all the time on your mind, that it can be done and should be done. So you just do it. (Sebastian, N03)

Melanie and Sebastian's words demonstrated an ecological understanding of affordances: even though different dimensions of affordances could be named separately, they worked together as a system in people's lives and every system is unique. This viewpoint then helps us examine not only functionality but meanings to the way objects, information, people, culture all work as a dynamic system. It is useful to bring in Bronfenbrenner's systematic view: environment and its relation to humans are regarded as hierarchical and can be divided into *microsystem, mesosystem and exsosystem.* Even though his concept has been used mostly in child development, it also serves well as a framework for understanding and analyzing the development of people's environmental consciousness and behavior. Similarly to Bronfenbrenner's emphasis on the dynamic features of "the systems of systems," different dimensions discussed in this chapter form a dynamic web of systems (Bronfenbrenner & Crouter, 1983)**.** The system of affordances is also equivalent to what Barab and Roth named "affordance network" in spirit:

> An affordance network is the collection of facts, concepts, tools, methods, practices, agendas, commitments, and even people, taken with respect to an individual that are distributed across time and space and are viewed as necessary for the satisfaction of particular goal sets. (Barab & Roth, 2006, p. 5)

Barab and Roth used this concept to understand knowledge acquisition and offer curriculum designs for better learning experiences. They also hold an ecological standpoint and stress the different components in context should be considered through people's life-worlds, rather than being treated as separate factors. This ecological perspective can be well adopted to describe how people perceive, conceive and act. As discussed in the previous chapter, people's recycling orientations should be considered as multi-dimensional; the influences of contextual factors should also be regarded in their spatiality and temporality. When we examine the system of affordances of a certain setting, even though all elements are important, they may play different roles depending on the type of setting or the corresponding people-environment relationship. For example: micro-level physical affordances may be more important in public space than in the home environments; social affordances may be more influential for people with little or moderate environmental consciousness, but may not be as powerful for those who lean towards the radical end or for fundamental environmentalists. Information affordance can be more significant for people who have just moved to a new place, no matter whether it is a new neighborhood, new city, new country, or even simply a new workplace. The different importance of information affordance is not limited to people and their localities, but also to temporality. When a new policy is implemented or current recycling laws are being changed, information will become salient and change the

dynamics of the system of affordances.

Viewing different dimensions as a dynamic affordances system may be a reasonable way to understand how and why people recycle but is it possible to explore further how different dimensions work together? From the participants' words we can at times get some glimpses or vague impressions that recycling is most possible when different elements are in sync with each other. But do different dimensions work in parallel, in hierarchy, or in some sorts of combinations? How are people influenced by all the different contextual factors? Does it depend on individual life-worlds with which they come into contact? By way of conclusion the next sections offer two possible models of how different dimensions of affordances relate to one another and how they work as a system.

4.8.1 Onion Model

The first model is called "the onion model", inspired by Bronfenbrenner's *microsystem*, *mesosystem* and *macrosystem*, along with Winkel, Saegert and Evans' views on the hierarchical nature of settings and contexts (Bronfenbrenner & Crouter, 1983; Winkel, Saegert, & Evans, 2009). When different dimensions of affordances work as hierarchical layers, the system is similar to an onion. Imagine every individual is at the very core of the onion, the most immediate layer could be the physical environment, followed by the social environment, with the political and cultural environment as outer layers. Consider the situation when a person is going to dispose of something: his or her decision may be mostly influenced by what containers are available, with possible considerations of whom s/he is with, while the political and cultural influences may be influential, yet less direct.

This model helps explain behavior across different micro-environments but under similar meso- and macro-environments. When people find themselves in a place (such as in the park) where recycling bins are nowhere near available, they might just toss the recyclables into regular garbage cans. Even though the physical environment is proposed as the most inner layer in this model, it just means that it has the most immediate influence on people but does not exclude influences from outer layers. When the outer layers are strong and positive, they will likely alter meanings of or obstacles in the inner layer. A similar example: when recycling containers cannot be found at the moment in the certain place but the general social, political and cultural environments are consistently recycling-afforded, people are more likely to carry the recyclables around until they spot proper containers. The hierarchical structure implies that when inner and outer layers afford recycling in different directions (positively vs. negatively), the strength of the outer layers has to be more powerful than the inner layer to reach the person.

The advantage of this model is to have an organized structure of different dimensions, and to provide an order to examine each dimension in context. However, it does not necessarily depict the nature of contextual factors. While it is intuitive to imagine that different factors form some hierarchies, these layers may actually be fluid rather than solid as an onion. The hierarchy of different dimensions may not be absolute either. For instance, social environments may have more influences than physical environment for some people.

4.8.2 The Transparency Model

The other possible model considers different dimensions in parallel; their effects

add up like layers of transparencies. They have direct, non-hierarchical influences on people, and may increase, decrease or alter the effects of each other. People's recycling attitudes and behavior can be seen as the final image contributed by all different sheets of transparencies. It helps us to imagine the amount of contextual changes on people: when a person leaves home and goes to work, the "home environment" transparency is replaced by the "office environment" one. Whether the change of the sheet affect this person's recycling decision depends on the projection from all the transparencies. Therefore, negative physical environment changes may not be influential if all other contextual factors afford recycling positively enough. On the other hand, if the system is already shaky and only relies on one working physical affordance (such as compartmented containers placed by this person at home), replacement of this sheet will alter the entire image- then the person in question may not recycle in the office.

This model also helps explain confusions and struggles that some people experience when they perceive mixed affordances in different contexts. To simplify the description, if we imagine each positively afforded context as a green transparency, and a negatively afforded context as a brown one, inconsistent colors will yield a muddy image. Moreover, similarly to the example given in the last paragraph, if there are constant interchanges between a green one (at home) with a brown one (in the office), the projected image will be rather shaky, as well the person's attitude and behavior towards recycling.

The transparency model seems more fluid and open to change, yet it focuses more on the final image (the influences) on the person and fails to acknowledge any relation between different contexts. As mentioned earlier, the social environment is likely to be

influenced by the larger cultural environments, while physical environments in public spaces can be a product of political forces.

It is clear that neither of the two models can satisfyingly explain how contextual factors work as a system (or systems). While this study cannot contribute to a conclusive explanation, it opens up possible directions for future research. We have learned piece-by-piece how contextual factors may work together or against pro-environmental attitudes and behaviors. For example, (Derksen & Gartell, 1993) surprisingly found that people's pro-environmental attitudes (concern for the environment) affected their behavior only when recycling programs exist in their neighborhood. Their work, like mine, suggests that environmental concerns alone cannot overcome contextual conditions that inhibit recycling. My study further differentiated various types of contexts, and demonstrated how people's behaviors are influenced in different contexts. The proposed two models provide possible explanations of how different contexts work in relation to one another. It will take many more careful designed studies- possibly both qualitative and quantitative to make the whole picture clearer.

No matter how different contextual factors work in a system, it is important to emphasize the dynamic feature of the affordances system (or systems): they are fueled with people's growth in knowledge, their adaptations to the new environments, and the changes they made to the surroundings. In the next chapter I will focus more on the temporal dimension, the changes of time, and how the various dimensions of recycling behavior and pro-environmental consciousness transect with the space-time spectrum.

Chapter Five: Relocating Oneself

As presented in the previous chapter, recycling affordances in Germany appeared to be stronger and consistent across different contexts including the physical, social, political, economic and cultural environment. The comparisons provide the background knowledge for answering the following research question that will be analyzed in this chapter: *How does relocation and the related change of environmental cultures affect people's environmental concerns and behavior*? After Americans moved to Munich, did their pro-environmental attitudes and recycling behavior increase because of the better recycling affordances? By contrast, given that recycling affordances in New York City are weaker than in Munich or than in Germany in general, were Germans' recycling behavior declined after they moved to New York City? Before answering the above questions directly, a brief review of some psychological literature on the topic of changes in environmentally-friendly behavior will be helpful to provide some background knowledge.

Psychologists often study pro-environmental behavior by analyzing the elements and processes that influence the targeted behavior. Some of these researchers focus in particular on examining the nature of behavioral changes, discussing the conditions for changes, and investigating the effectiveness of interventions. Dwyer and colleagues categorized different intervention techniques for pro-environmental behavior based on a review of fifty-four studies from 1980 to 1990. They proposed two major categories: the first one is "antecedent conditions," including commitment, demonstration, and goal-setting strategies. The second is "consequence conditions" which includes feedback, rewards, and penalties (Dwyer, Leeming, Cobern, Porter, & Jackson, 1993).

While many of the behavioral intervention studies aimed at generalizing and applying their findings, they often failed to build a practical method for implementation in real life. As Dwyer et al. (1993) noted, there are at least two limits to these studies: One is that much of the research in this field did not directly compare different types interventions[29], thus it is difficult to know which one (or their combinations) of the approaches is more effective. The other is lack of follow-up measures for these interventions. Among the few studies that included follow-up assessments, the follow-up period was usually only weeks after the intervention which made it difficult to evaluate the longer-term effect. Even within the short-term follow-ups, most changed behavior was not maintained. (R. Katzev et al., 1993, 1993; Wang & R. D. Katzev, 1990; De Young, 1986).

Behavioral intervention studies focused on effectiveness to bring about changes in the target behavior, but not the processes of the change or the attitudes associated with the behavior. Another way to investigate behavioral change is to examine how people establish and change habits. (Dahlstrand & Biel, 1997) proposed a "stage-based habit change" process by investigating the relationship between steps in habit-establishing and change of pro-environmental behavior. They used questionnaire data from a sample of 500 Swedish adults. Their results supported the hypothesis that general factors like environmental values and a sense of responsibility for the environment will be more influential in an early phase rather than in a later phase of changing established habits[30]

[29] Comparisons were more common within one type of interventions, for example verbal versus written commitment. But few studies compared the effectiveness among different intervention techniques.

[30] Their model plotted out seven steps for behavioral change: activation, attending present behavior, consider alternative solution, planning new behavior, testing new behavior, evaluation of new behavior, establishment of new habit.

There are some other studies that did not target behavioral change yet are relevant to the topic. For example, Ericksen and Jasckson-Smith found that exposing people to recycling programs helped them increase their environmental consciousness and pro-recycling attitudes (Ericksen & Jackson-Smith, 2005) They also found those changes are applicable to those who were non-recyclers and moderate recyclers. Their research went against the grain of the attitude-behavior paradigm that is dominant in pro-environmental studies.

Reid and colleagues (L. Reid, C. Hunter, & P. Sutton, 2009) used an innovative research method: an alternative intervention or educational opportunity. Research participants kept a diary and used it as an opportunity to discuss certain environmental decisions with their family members. This unique method proved to promote reflexivity of people's environmental actions. The researchers found that by keeping a diary and discussing environmental decisions with family members, people tended to increase their environmental awareness and possibly commit to change.

Related, yet very different from the studies mentioned above, my research also investigated changes in people's pro-environmental attitudes and behavior. Instead of adopting short-term interventions and experimental settings, I used relocation as a natural experiment which provides a different lens to examine changes. After suggesting a multi-dimensional view of people's recycling behavior and investigating multiple domains of affordances as contextual factors, now we can look at what happens when contextual factors change: Do people's behavior change along with the context? Are the changes omni-dimensional or dependent on the person's original status? Are these changes temporary or becoming permanent?

People talked about the impact of living in different social and cultural environments on their recycling behavior, usually extended to a much broader sense of everyday environmental practices. The most common changes in habits people mentioned were learning or ceasing to bring their own bags, reducing their use clothes dryers, increasing their exposure to nature; using public transportation more frequently; more energy and water saving awareness, and so on. People also often detected their own changes when they visited their home country after living in the host countries for a while and had established new recycling habits.

Chapter Three discussed "people" and various ways to examine, understand and challenge recycling orientations. Chapter Four focused on "places", or different domains of contextual factors. This chapter will expand the dimension of discussion from people and place to *time*. I will discuss "changes" from three aspects:

1. Perceived changes: Questions of changes of thoughts and behavior after relocation: "Do you think moving to a new city/country had any influence on your recycling habits or your thoughts/concepts on recycling, and/or other environmentally-friendly thoughts?"
2. Reflected changes: Questions of changes people self-observed when they returned to visit their home country. (Have you been back to the United States/ Germany after you moved here? If so, did you notice any differences in your attitudes or behavior when you went back?31)
3. Predicted changes: Questions of asking them to predict their behavior change if

[31] This question was not in the original interview guidelines but was commonly brought up by the interviewees, so I added it to the guidelines in later interviews.

they move back “Do you plan to go back to USA/Germany? If so, do you expect any of your recycling thinking/behavior to be different in any way? (Why or why not)”

5.1 Perceived Changes- Changes after relocation

Many participants discussed their own adaptation process and changes in the way they handled garbage and recycling after moving to another country. Here I will talk about the changes people perceived in their recycling attitudes and behavior after relocation.

5.1.1 Americans moving to Munich:

American interviewees had a wide range of recycling experiences before moving to Munich. While a few of them lived in places with mandatory recycling programs, most of them came from a city or town that did not have recycling programs or had voluntary programs run by communities that recycled limited items. Some of them only recalled occasional recycling events such as semi-annual paper drives organized by the Girls Scouts. Most of the American interviewees had to learn about what, where and when to recycle. Even for those who had regular recycling experiences in the U.S., the programs were mostly limited in scope and varied from place to place. In any case, the garbage categorization and recycling processes in Munich seemed new for American participants.

As mentioned in Chapter Two (2.4.2), Munich’s waste stream is more complicated for residents than that of New York City. There are more categories to separate, different places to recycle due to their mixture of a pick-up and drop-off system, establishing recycling habits is further complicated by various regulations regarding when things may be dropped off, for example in Munich there is no drop off after 7 pm. Such a sophisticated recycling scheme could result in a steep learning curve as new habits

develop, even for an environmentally-conscious person like Virginia. She admitted it was not easy at the beginning, but recognizing it as positive, she used an analogy: *"I think just like flossing your teeth, you have to make it a habit. And once you make yourself do it, time and time again, then it becomes granted, it becomes part of your life.*"

Virginia understood the development of her recycling habits to have been supported and maintained by Germany's general environmental friendliness. She mentioned quite a few energy-saving devices that constantly reminded her to care for the environment.

> The interior lights in buildings are not on throughout the nights. When you come in, you hit the button to switch, which is easily accessible throughout the building on every floor, and the light comes on and remains on for 2-3 minutes, and then it cuts off. All these little things add up. **And I think you don't think about it, it's like what you know, how it is in your town, so I don't think we even think about it until you move to somewhere else and see: "oh wow".** You know, Europe does a lot, a lot of things better than I think in the US. [Emphasis added]

Many American interviewees mentioned the feeling of "being surrounded by pro-environmental atmosphere" in Germany, and directly attributed these influences to their environmentally-friendly behavior. Greta came to Munich as an exchange student, and she already started to feel bad if she did not recycle just nine months into her stay in Munich. Noticing that people in Munich were more environmentally aware and respectful, Greta thought, "*it's just something that grows on me. That's the thing I want to do. And I think when it surrounds you, you think about it more.*"

Similarly, some interviewees connected their recycling behavior changes with the different lifestyle they developed in Munich. Lucinda mentioned that, after moving to Germany, she biked more, swam an hour every day, took more public transportation and gardened in her backyard. She thought all of these lifestyle changes made her more fit at the age of 53 than she was 20: "*You stay healthy and active. And the lifestyle is possible here; it's not possible in Oregon, or San Jose. It is not possible*.[32]"

Many interviewees' environmental awareness was altered by the new people surrounding them. Tina came to consider environmental issues as political issues too. She observed that environmental issues were brought up in politics in Germany more, and the Green Party always talked about these issues. This observation was in contrast to her experiences before relocation:

> In the States, I don't feel like it. People there are not talking about environmental issues, not really. Being over here just experiencing, you know, political side of life, which is the practical that…you know, recycling is…basically everywhere**.**

For people who already had strong environmental awareness before moving to Germany, the changes were more behavioral than attitudinal. Lisa co-owns an English second-hand bookstore with her husband in Munich. When she tried to think of the changes she had made after moving to Germany, she thought most changes were more about what she did rather than how she thought. She was already very environmentally conscious before she moved to Munich—opening this second-hand bookstore with her husband was a shared dream and a way to practice their care for the environment. Living

[32] One of the key reasons for her healthier life in Munich is the convenient and consistent public transportation both in the city and throughout Germany, as well as well-developed bicycle path.

in Munich provided her more opportunities to practice the behaviors she always wanted to do but could not find the way to in some other places:

> I really do appreciate that Germans are so forward thinking here. There are towns in North Carolina where I visited people- they don't recycle anything. But …so, I like living in some place where you can recycle quite a lot. But it hasn't changed my thinking about the environment, no. I think we're pretty… we're trying to be pretty environmentally conscious.

To sum up, for Americans who moved to Germany, the direction of changes tended to lean towards greater environmental awareness and more recycling. Even though there might be some unpleasant moments in the learning processes[33], interviewees all reported their changed behavior positively.

5.1.2 Germans moving to New York City

Unlike many of the Americans moving to Munich, all the German interviewees had regular recycling experiences before relocating to New York City. Instead of learning how to recycle, German participants learned how to throw away items they used to recycle, which could be quite a challenge for them. The changes that Germans underwent after moving to NYC were more diverse. While it was common for them to notice that there were fewer environmental concerns in New York compared to their experience in Germany, their reactions and degree of adaptations differed. While some of them felt upset that they could not recycle as much as before, others became lazier and simply found themselves being sloppier in sorting garbage. Some items just remain unsettled, like the battery mentioned in Chapter 3.

[33] For example, Virginia talked about her experiences in carrying heavy recyclables in cold winter days.

Sebastian moved to New York City during the two-year recycling program suspension. As a consequence, for a long while, he thought the city only recycled paper, without realizing that the status quo was just temporary. The building in which he lived in at the time did not keep up with all the recycling program changes; as a result, the information was fuzzy and confusing. Even when the recycling program was fully resumed in 2004, he was not entirely sure what to recycle in NYC. Sebastian mentioned his gradually reduced concerns about separating garbage but he did not think it was because of his having changed his ideas about it, but rather it had something to do with living in a different culture. "*I was kind of always swimming against the flow, but I think it's much easier I guess, that you just do what everyone does.*" This change is similar to the way he now litters sometimes. When he was in Germany, he would never have thrown garbage on the street because it was so clean there, compared to seeing garbage everywhere in New York City. Now he would sometimes throw away small stuff on the street, like a piece of gum wrapped in paper. This change amazed him also: "*In Germany if I'm going to do it, I'd tell myself, 'no, you cannot!!' Then I won't do it. Here, I'd ask myself, why have you been changed? What happened to you?*"

Kai mentioned a few changes he noticed after moving to the United States. Like many other Germans, the first change that came to mind was the amount of garbage he produced: "*Since I came to America, I know that I produce way too much waste. That I know for sure*." As for waste categorization and recycling, he thought he was "*certainly not as diligent sorting out of garbage and recycling as my family, when I was in Germany*" and he interpreted his changes as to "*take on more of the kind casual way of Americans*." When I asked him why he thought he changed in this direction, he replied,

"*Taking on a bad habit.*" Similarly, Barbara thought she produced much more garbage in NYC. When she was in Germany, it usually took her four days until it was time to take out the trash compared to almost every other day in New York--and she does not even cook as much as in Germany.

Sabina also commented on producing more garbage in New York City but a large part of it was due to fewer recycling opportunities, like cloth or fabric recycling, electronics, and excessive packaging. When she bought eggs in Germany, she took the empty egg package[34] to the store and just got eggs, "*So you don't end up getting each time a new container for eggs*." Same thing with milk and yogurt: she could keep the glass and return it to the store. Sabina also noticed that there were a lot of extra products in glass, "*We don't need plastic each time….You pay a little deposit for the glass, and then return the glass, which I think it's much more considerate, instead of each time using plastic and then throw it away."*

Another garbage-related behavioral change is bringing reusable bags for shopping. While it was common practices in Germany, most Germans significantly reduced, if not entirely abandoned, this behavior after relocating to the States. Stefanie recalled that after she had just moved to New York City, she was just shocked when she went to the supermarket, "*they would basically give you…20 bags. Everything was always packed and packed*…" She said she used to tell the baggers in the supermarket that she did not want a bag, because she had her own bag. "*They would look at me, just like I was weird, you know.*" Even though she still tried to bring her own bag and not use excessive plastic bags from the stores, she did not make as many efforts at this anymore.

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[34] In German supermarkets, people can get eggs by count instead of pre-packed carton. Bringing their own egg containers or reusing egg cartons (always cardboard ones, not Styrofoam) was quite common there.

Eckart's perspectives about recycling changed after moving to NYC. When he was in Germany, he sometimes felt the practice of recycling made him feel like a "*systematic, funny German in a way*", which he noted in a self-teasing tone. He thought it took up so much space to recycle because there were so many different categories. The act of putting things into different boxes made him feel a little bit ironic yet funny. It was very German. However, after moving to the States, he was frustrated in his recycling efforts. Even though a mandatory program exists, it is not practiced everywhere. Recycling was transformed from some daily routine that he could at times joke about, to something that he had to fight for on some occasions (please refer to 3.4.1 in Chapter 3 for his recycling fighting story in the office building.)

Eckart's case represents a situation when moving to a less-environmentally friendly city does not force one toward a more wasteful lifestyle. Things can develop in a different direction- make people realize their environmental consciousness and become even more aware. John's story provides another example of this possibility. Before moving to the US, his environmental consciousness appeared to be average or normal in Germany---caring for the environment and talking about environmental issues were part of daily life. After relocating to the United States, he found himself annoyed more often and confronted daily life situations that triggered his environmental consciousness. Things like double-bagged merchandise and 20 napkins given away with one cup of coffee all triggered his awareness that was just running in the background when he was in Germany. "*Maybe it's just more apparent to me. It's ridiculous. Why we're generating so much garbage*."

Overall, Germans changed their recycling behavior in different directions, along

with other pro-environmental behavior and awareness changes, after moving to New York. It should be noted that New York City already has a mandatory recycling program—even though it is less far-reaching than what they experienced in their hometown. It is still more similar to Germany than many other American cities. It is conceivable that if this study were done in other places where recycling is even not available or only voluntary and requires people to drive a longer distance to recycle, the contrasts would have been even greater--as would the incurred emotions and reactions.

5.2 Reflected Changes: Experiences of visiting back home

Another way to demonstrate people's changes is through self-observation when they return to their home country. Sometimes change occurs gradually and slowly so that they might not be evident or might not necessarily come immediately to mind during an interview. Prompting questions regarding their experiences in sorting garbage and recycling when interviewees went back home appeared to be effective in initiating retrospection. The experience of returning to their hometown contrasts the different cultures of the two countries and often stimulates reflections on behavioral changes and it sometimes triggers them to compare their old selves with the new one. Friends and family in the home country often act as mirrors that reflect behavioral changes that they might would not notice otherwise.

Reflected changes provide an avenue for examining how people change with the surrounding environment: do people automatically switch back to previous recycling behavior when they return to the old place? Or will the recycling habits developed in the host country linger for a while? Furthermore, does the duration of the change depend on the ease of old habit versus new habit, or is it further dependent on the person's

pro-environmental attitudes at the time? In addition to the changes reflected during the trips, a different interpretation of the old behavior may be involved in the process; old habits may be perceived differently in contrast to the new behavior. When people go back home and behave similarly to the ways they did before, new feelings may emerge as a result of the changes of thoughts or behavior they developed in the host country. Before moving to Germany, Virginia did not think too much about throwing away everything into the garbage but it is quite different now:

> It breaks my heart when I go back home to visit my family, and we were cooking and cooking, and I was just like throwing everything into the trashcan. It kills me now. But before that I didn't think about it so often. It was more like, oh ok, that's the way it is." (3:24)

A similar scenario happened to Melanie who claimed her recycling is mostly based on economic incentives. After living in a different country, she picked up different habits and carried them along, like collecting bottles for deposit. She noticed that when she went back to the US, every time she got a bottle of water or something, she would not throw it away, because "*it's just in my head, I kept collecting all the bottles that I had to take them back to get my Pfand [deposit]*."

Jenny learned to recycle much more in Germany compared to in the US. As a result, garbage forms certain categories in her mind: recyclable and non-recyclable. However, she found it difficult to recycle when she visited in the US. In the beginning she would speak out when she saw her friends throwing away recyclable material, but they all laughed and still threw them away. "*Because everyone of my friends and family they don't recycle. And I don't want them to think I became this ….you know, overly ambitious*

person type." All the things she became used to in Germany, such as taking the paper off the aluminum cans and putting them into different recycling bins, just did not work well back home.

Sebastian said he basically switched back to a recycling-mode when he went back to Germany but definitely was not as strictly as before he relocated. He also mentioned a recent encounter with his mother during his last visit, when he placed the plastics with the Grüne Punkt labels into the regular garbage. His mother almost yelled "*NO~~ What are you doing?*" Then he realized that he completely forgot about that perhaps because of the very limited plastic recycling in New York City. He continued saying:

> So I felt sometimes…most of the time I do it automatically, but sometimes … [*pause*] especially if I'm by myself, like you know…if they [parents] spend a few days away for the holidays or something… then I kind of behave like I'm in America a little more. Not totally, I would still…for example, like I'd forget about the Grüne Punkt. But the organic, and the glass and the paper, I wouldn't forget. But even in Germany I'm a little less concerned to separate.

Later on, Sebastian commented on the effect of the duration of his stay in Germany: when he only spent two weeks there, he would not switch back to the German super-recycling mode automatically. If it was a longer stay, as when he once went back for three months, not only his recycling behavior returned, but his concern about separating garbage was carried with him back to New York. The refreshed environmental awareness and attentiveness to garbage sorting lasted about another month, "*and then I forget those*."

Stefanie found herself sloppier about recycling compared to what she used to be,

even when she was back to Germany. She usually tried to go back to home for Christmas and ordinarily stayed in her parents' house. Even though she thought it was relatively easy for her to switch back to "*the German way of being environmentally-friendly*" she sometimes found herself having to ask where certain items belonged.

5.3 Predicted changes

Behavioral changes occur in many ways- some are supported by attitudinal or knowledge change, and some are inhibited by barriers or promoted by reinforcers. After discussing the perceived changes and reflected changes, one wonders whether the changes can be sustained and to assess the influence on place on behavior. If the environment changed again, will the attitudinal and behavioral changes be reversed? As we cannot know the answer definitely until they move back, I asked a hypothetical question to get people's self assessment.

Many of the research participants had no plans for or were ambiguous about moving back to their home countries. But those who did plan to move back, and those who were willing to imagine and comment on the possibility, they had different visions of their projected behavioral changes.

Most American interviewees intended to continue their recycling practices after moving back to the United States and maintain other habits they developed while living in Munich. How well they would be able to transplant all the different environmentally-friendly behavior, however, is dependent on a few factors. One of them is what kind of place they would move back to and what that place would provide. Unlike Germany, recycling programs have been carried out quite differently in the US, depending on one's locality. Melanie thought it depended on what was provided: if she

moved back to a community where no recycling was offered, she would just put everything in the trash. She thought her recycling behavior was always based on "*what is cost-effective, and what is easy."*

David made a similar comment on the possibility of moving back to the U.S: "*well, you can't take advantage of the mechanism if the mechanism is not there*." Realizing that he had little control over the existence of recycling programs, he thought the least he could do was to minimize the garbage and to be more careful with shopping if he moved back to the States.

For those who were already recycling before moving to Germany, the extensive recycling experience seemed to strengthen their recycling motivation. At the time of her interview, Greta was ending her exchange student visit and expected to move back to the States in three months. Her university in the U.S. had a good recycling program, so she would just keep the habit she'd formed here: "*I mean, I always recycle, I'll keep doing that*." However, other things she liked doing in Germany such as biking and taking public transportation would not be feasible back home. Instead, what she would probably do was to buy an eco-friendly car. Another exchange student, Sarah, became much more aware of her energy use, and thought she would try to walk more and drive less after returning to the US. In addition, Sarah noticed people in Germany commonly using racks to air-dry clothes instead of driers, which appeared to be an easy and energy-saving idea. She said she would keep doing that after moving back home.

Biodegradable recycling inspired Jenny to compost. When I was interviewing her, she was planning to move back to California soon due to her husband's work. She said she wanted to start composting: "*it's so productive, you know, using what you're*

recycling. So you see the whole process. So it's not like ...you put it in a glass box somewhere and wonder what happens to it." Jenny liked to grow things and she was hoping that some day she would be able to do that that when they have a yard.

Germans' visions of moving back home appeared to be more unified. People mostly reported that they would switch back to the recycling mode if they moved back. As Barbara said, "*I'd be happy to go back to the country that is taking care of it [the environment] better*." Stefanie shared a similar sentiment, but made it even more specific to the system:

> I think I'd switch back easily to the German way of being environmentally-friendly, you know. And it's totally normal, if you go out, basically, or if you go to a bar, you pay a fee [glass deposit], you know for the ….you bring back to the bar. Everywhere is Pfand, Pfand, Pfand. It's just norm. It's not that difficult to switch back.

Meanwhile, Stefanie was also very practical about the steps she would need to get back to her German recycling routine. If she moved back to Germany, she would have to educate herself a little again about how it worked, because she needed to know what was recyclable under the current policy and where to sort various items. She recognized that she would have to learn about it.

Overall, even though Americans who moved to Germany seemed to be influenced more by their foreign experiences as far as environmentally-friendly behavior, there are limitations about what people can do, and how many of the changes they can carry back after returning to their home country. Recycling seems to be one of the more context-dependent behaviors, compared to other environmentally-friendly behaviors like reducing energy use or decreasing consumption.

5.4 Two cases:

The above discussion of perceived, reflected and predicted changes provides us with a generic view of changes across different individuals occur. However, these descriptions might not be the best way to capture what happened at the individual level—or in other words: how a person has changed across different *contexts*. For this purpose, I would like to present two cases that allow more personal contexts for the stories. The two cases were chosen not based on representativeness but rather because of their complexity. They also provide more spaces and possibilities for further discussions and questions. Hopefully the two cases will help us trace changes across people's life course and understand those changes in context.

5.4.1 Bad Doggie's story

> *When I don't recycle, I don't think I'm irresponsible. I think I'm more environmentally responsible for not recycling… Recycling is a nice idea, nice concept, but doesn't work*. (M01, Bad Doggie)

Bad Doggie started developing environmental awareness in his youth. His first regular recycling actions began when he was studying in Cincinnati; at the time, the city government had just initiated its recycling program. He was more than happy to take a part because "*pretty much to my knowledge it's a good thing*." He also educated his grandparents about how to recycle when their town started its own recycling program. After getting his degree in the German department, he went to Regensburg in 1993 and noticed much stronger recycling laws in Germany: paper, metal, and plastic were all separated and glass was sorted into three different varieties. A year later he noticed a scandal reported in the news: the plastic that was supposed to be recycled actually went

to the incinerator. While it made some people skeptical about recycling, he gradually learned that was fine because plastics were made of oil and when it burns in the incinerator, it burns well and generated a lot of heat for creating energy. Recycling programs continued to be even more complicated in Regensburg, when he had to separate 6 different types of garbage. In 1995, he moved back to the United States and lived in Astoria, Queens. At that time, the recycling law was already effective in New York City, but it was simpler than in Germany.

Over the decades, Bad Doggie has developed an unusual viewpoint regrading recycling. He challenges the system of the subsidized recycling industry and does not consider recycling activity to automatically be an environmentally-friendly action. Self-identified as an environmentally-conscious person, Bad Doggie used to think recycling was important but now believes it is more important that people understand the reality behind recycling. He does not agree with people who recycle merely because "*it makes me feel better*." In his opinion, the extra energy and pollution created during the recycling processes should be factored into the equation. If recycling certain materials or products in fact consumes more energy and emits more pollutants compared to its alternatives such as waste-to-energy[35], then recycling is not as environmentally-friendly as it sounds[36]. As described briefly in Chapter 3, he differentiates values for recycling

[35] Waste-to-Energy (WtE) is the process of creating energy in the form of electricity or heat from the incineration of waste source. WtE is a form of energy recovery. Most WtE processes produce electricity directly through combustion, or produce a combustible fuel commodity, such as methane, methanol, ethanol or synthetic fuels. (http://en.wikipedia.org/wiki/Waste-to-energy)

[36] Bad Doggie's point is unusual but not brand new. There are at least two different aspects to challenge the pro-environmental values of recycling. The first one is addressed in anti-recycling debates, as in John Tierney's article in New York Times magazine (Tierney, 1996). The second one is to challenge the way we produce things: most products are not designed to be recycled. Rather, it is called "downcycling" because the proportion of reusable material goes down a lot in the recycling process. As an alternative, they suggested to reinvent the way things are made and turn downcycling to upcycling (McDonough & Braungart, 2002).

based on different materials; he believes only metal recycling makes economic and environmental sense.

It was clear from our conversations that Bad Doggie's environmental consciousness is not only self-claimed. He has very clear and accurate knowledge of what ought to be recycled and not, both in Munich and in different places he lived before. He followed the recycling suspension news in 2002 and remembered all the details even though he moved out of New York City a couple of years ago. He also gave thorough tips on ToyTown Munich (an online forum for English-speaking people in Munich) when people posted questions about recycling or any kind of waste disposal. He is also very attentive to energy use, both at his workplace and at home. In the beginning, I thought his devaluing recycling originated from prioritizing economics over the environment, but he clarified his critique on subsidized industry later on:

> I have no problem with a subsidy if it does an overall good, when there's an overall benefit. But there's no associate benefit. If we have to pay for the recycling industry which requires even more natural resources than simply using virgin material.

Bad Doggie does not think his environmental awareness increased or decreased by moving to Germany. Rather, his attitude toward recycling has developed over the years as he has gained more knowledge about the subject. To summarize his changed thoughts about recycling, Bad Doggie explained, "*I used to think it's important, but now I think it's more important that people find out the truth behind it, the economics behind it, and the reality of using recycled material versus using virgin material*."

Speaking of alternatives to recycling, Bad Doggie suggested the key is to lower consumption. He appreciates policies like the German Packaging Ordinance which helped to reduce the packaging to a great deal. He also thinks "*More thoughtful consumption, just purchase what you need and considering what would or wouldn't be thrown out or wasted in a non-useful manner*."

Bad Doggie's case may be extreme if we look at how small a role context seems to play in his recycling behavior. The most influence Germany had on his garbage disposal may be its well-rounded Pfand system. He said that because of the very high deposit, he collects and recycles all bottles with a deposit even though he does not agree with the concept behind the system. On the other hand, Germany's packaging law is in line with his ideal way to reduce garbage. One possible explanation for the fact that context did not influence him much are his strong and idiosyncratic attitudes towards recycling. Even though his arguments are certainly controversial, it is worth noting that recycling is truly a complicated industry suffused with many debatable aspects that may influence people's attitudes and actions towards recycling in unexpected ways.

5.4.2 Elke's story

> "*It come closest here, I mean, this neighborhood comes closest to what I have experienced in Germany. So we separated the garbage pretty much the same way that they separate here*." (N12:Elke)

Elke is a German professor living in New York City. She identified herself as "*an environmental-conscious person*" at the very beginning of the interview. She tried to minimize garbage by buying carefully, doing things like preparing her own food instead

of buying pre-packaged meals. When I asked her when and how she learned about separating garbage and recycling, she could not recall a specific period of time or scenario. Instead, she described the experience as:

> It was always part of my life. I can't really tell, because it was there before I was born. And I just grew up with it. Like my grandfather did composting, my mom took it on….I think it runs in the family, kind of.

Elke left Germany 11 years ago. When she first moved to the United States, she landed in Washington D.C and stayed for two years. Then she moved to Staten Island, followed by New Jersey before settling to her current apartment in Brooklyn. None of the previous places seemed to provide her adequate recycling opportunities. When she was living in Staten Island, the recycling program and local law were already in effect in all five boroughs in New York City yet her building simply did not separate any sort of garbage, as if the recycling program did not exist.

Not until she moved to her current place in Clinton Hills, Brooklyn, did she learn about the recycling regulations in New York City. When she moved into her building, the superintendent used municipal flyers explaining the recycling system and pointed out the recycling areas to her. Here she not only started recycling again but also found a way to recycle beyond the support of NYC municipal program-- almost as much as she recycled in Germany. The "miracle" happens at the block level. The superintendent in Elke's building initiated a composting program for the building residents and neighbors: she (the superintendent) carries compostable food waste to a nearby community garden where she is a member.

Both of Elke's parents had agricultural backgrounds, so she got all her composting knowledge from her family and composting was always a part of her life when she grew up. Being able to compost in the city is important to her, and it would be impossible without the local efforts which bolster the municipal composting programs in New York City[37].

Beyond just the composting, Elke described her current neighborhood as very environmentally conscious. She mentioned a recently opened juice place where they squeeze fresh juice into biodegradable containers. Over time, she took up the habit *"I just have to participate, because the system was already established here*." Even though Elke regarded herself as an environmentally conscious person, she admitted that she was not looking for information that might have been available when "*nobody was doing it*." In her current neighborhood, "*I just have to plug in, you know, because it was already established. I mean, I don't have to make much effort* "

[37] New York City has a "Compost Project" in which the Sanitation Department reaches out to NYC residents, nonprofit organizations, and businesses, and provides technical assistance for community-based composting programs. In the newly passed recycling law, the city government will expand the compost opportunities, but the details and effective dates are not published yet.

Figure 20: Compost bin in Elke' building

Elke's story provides a good example of the complexity involved in analyzing how different layers affect people's change in environmental knowledge, attitudes and actions. We can see that the immediate physical and social context can influence environmental actions despite or in addition to increased environmental concerns and attitudes. Yet this situation is not irreversible. Let us discuss her changes along with a different environments; we can summarize Elke's different actions in different contexts in four steps:

1. Growing up with strong environmental consciousness + strong recycling affordances in Germany -> recycling was always in practice;
2. Strong environmental consciousness + weak overall recycling affordances (in DC & NJ where there were no municipal recycling programs) -> no real action or limited action;

3. Strong environmental consciousness + moderate city-level recycling affordances + weak immediate affordances -> no real action or limited action

4. Strong environmental consciousness + moderate city-level recycling affordances + strong block -> back to the way she recycled in Germany.

From the four steps shown above, Elke's example shows that, while the macro-environment can indeed discourages people from recycling (from greater recycling culture to lesser one), the micro-environment could act as a shield that enabled her to recycle the way she did in Germany. In her case, the immediate context (the physical and social environment on the block level) seemed to have the most impact on her recycling behavior. It is possible that because of her stronger environmental consciousness, changes in context simply inhibited her actions regarding recycling; when the opportunities were offered again, it was intuitive for her to "restore" the actions as before.

What we learned from Elke's case echoes previous research: environmentally-friendly attitudes alone are hardly enough for pro-environmental actions. Moreover, recycling programs in the macro-environments, such the NYC mandatory recycling law, are not sufficient either; localized physical and social support seem to be the key to sustaining the recycling behavior. On the other hand, Elke's story demonstrates the possibility that people can change multiple times along with transitions in their environment: once-hindered recycling behavior can be restored easily when a person is again exposed to a supportive environment.

The two cases illustrate very different patterns in how people change along with their contexts: while Bad Doggie seemed to be influenced more by his own developing knowledge of recycling than by living in different environments, Elke changed her behavior several times along with where she was and the available supports from the immediate environment.

5.5 Discussion

Demonstrating changes in three aspects -- perceived, reflected and predicted-- allows us to see an overall picture of how attitudes and behavior have changed at different places. For Americans who moved to Munich, especially those without prior recycling experiences: they learned about recycling in a place suffused with a pro-environmental atmosphere; as a result, they not only formed recycling habits but initiated many other environmentally-friendly behaviors. The reasons behind the change are often multi-dimensional as discussed in Chapter 3. People are motivated to recycle for various reasons, but the directions of changes are towards more participation in recycling and increased environmental awareness. As for Germans who moved to New York City, their recycling behavior was often circumscribed within the relatively narrow scope of the municipal program. They also had some emotional responses when encountering some wasteful situations.

In addition to the general patterns above, there were some group differences related to participants' past recycling behavior and their environmental awareness. For a clearer explanation, I roughly grouped people with more or less environmental awareness, and places with more and less environmental-friendliness; therefore, there are four major scenarios with the combinations of people and places, as shown in Table 5. Cell (1)

depicts some Germans moving to NYC: when their environmental awareness was not robust or when they were skeptical about recycling, they tended to become lazier and sloppier with garbage categorization or felt liberated from all the rules they had to follow in Germany. Cell (2) described most Germans' experiences after moving to New York: they experienced frustration, anger, and sometimes confrontations with others. They could no longer recycle as much as in Germany; with some items like batteries, they just kept them as unsettled matters. Cell (3) illustrates most Americans' experiences after moving to Germany: they recycled more and became more engaged in other pro-environmental activities. They also expected themselves to carry some of the new habits if they moved back home. Cell (4) described some Americans who came with ample recycling experiences and greater environmental consciousness. Those people did not change much in their environmental attitudes, but they felt their pro-environmental actions were better supported. This finding corresponded to Ericksen and Jackson-Smith's study that exposure to recycling program increased environmental awareness mostly on those who were originally non-recyclers and moderate recyclers (Ericksen & Jackson-Smith, 2005).

Place / People	Less environmental-friendliness (NYC)	More environmental-friendliness (Munich)
Less environmental-awareness	*(1) Some Germans moving to NYC:* Became lazier and sloppier. Feel "liberated" from all rules.	*(3) Most Americans moving to Munich:* Changes are likely to occur both attitudinal and behavioral: recycle more, increased environmental awareness.
More environmental-awareness	*(2) Most Germans moving to NYC:* Experienced frustration and anger. Decreased or constrained pro-environmental behavior. Possible increases in environmental awareness due to contrasting cultures	*(4) Some Americans moved to Munich:* Already recyclers who make few or no changes in attitudes, but their environmentally-friendly behavior is better supported.

Table 5: Summary of people's changes in different groups

In addition to the generic patterns shown above, there are some additional patterns I would like to discuss further. First, different pro-environmental behavior changes are connected to one another. Both Americans and Germans showed that recycling behavior is changing along with other environmentally-friendly behavior. Americans not only recycled more but also became more aware of their energy use and took more public transportation. For Germans who were discouraged from recycling, they also semi-abandoned their habit of bringing their own shopping bags and some even became careless in littering. These connected behavioral changes could result from the

cohesiveness of the environmental friendliness in each city, including the physical, social and political environments.

Moreover, a less supportive environment does not necessarily decrease one's environmental awareness and pro-environmental behavior. The difficulty with recycling extensively in New York City, along with other wasteful behaviors seen in daily life, served as stimuli for Germans to think more about and appreciate their environmental culture more. Witnessing how people's actions can make the environment worse actually strengthened some Germans' environmental consciousness as they became more aware of the problem once they saw the problems. The new environment serves as a contrast to the old environment and triggers their thoughts instead of assimilating them to the dominant mode of the current environment.

Another phenomenon worth noting, even though it was not included explicitly in the analyses: many Germans traced their environmental awareness and recycling behavior back to their families and ways of upbringing, while American participants rarely mentioned family when they talked about the development of their environmental consciousnesses. It is possible that Germans are generally more grounded from childhood in their connections with nature and care for the environment. This could also explain why Germans thought they would switch back to the way they were if they moved back to Germany, in addition to the existing requirements in Germany.

Even though most participants fit in the general patterns shown in Table 5.1, individuals do have their own unique trajectories of environmental awareness and pro-environmental behavior development. The two stories presented earlier in this chapter were an effort to show the complexity and very different possibilities when

people encounter different environments and their affordances.

This research also had an unintended influence on some participants. For instance, at the end of the interview with Barbara, she told me that it was because of the study that she started to reflect on herself and realized some things to which she had not paid attention. Before she was asked questions about recycling and environmental awareness, she never considered herself as an environmentalist—but it did not cross her mind that the same behavior could have a different meaning here. It was also after the interview that she realized how little people talk about environmental issues in the US compared to what she experienced in Germany. Meanwhile, she realized how little she knows about environmental policy in the US. These kinds of comparisons may not easily be detected if the interview questions did not trigger self-reflections and encourage tracing back the trajectory of changes in the selves.

Chapter Six: Conclusion

This dissertation attempted to use relocation as a means to examine the role different contexts play in environmental attitudes and recycling behavior. I investigated people's recycling orientations and proposed a multi-dimensional model to fully understand the complexity of this seemingly simple behavior. Furthermore, I identified different domains of contexts and analyzed how they influenced people's environmental awareness and actions. Lastly, by looking closer into people's changes after moving to another country, I learned about different interactions between people and place and its power to stimulate new thoughts and engagements. In the final chapter, I will discuss how this research has inspired my understanding of urban recycling, of environmentally responsible behavior research, and of people's relations to their contexts. This chapter will conclude with suggestions for further research, and recommendations for recycling policies.

6.1 Theoretical Inspirations

6.1.1 Environmentally Responsible Behavior Studies:

Current trends in environmentally responsible behavior studies have been predominantly focused on the attitude-behavior connections. However, any pro-environmental behavior can be initiated or inhibited by a wide range of contextual factors and they need to be investigated if we are to build more comprehensive models of the phenomenon. I have argued in this dissertation that recycling can be conceptualized in different ways: it is not only regarded as a pro-environmental conduct, but also as a way to conform to social norms, as a cultural symbol, and as political actions. Moreover, it is possible for some people not to recycle certain items just because they believe it is

more environmentally-friendly to do so. People recycle or do not based on diverse reasons, and environmental reasons may not be the first for all people. This dissertation has demonstrated that there are benefits from looking into other factors that determine people's behavior and decisions as a whole rather than focusing only on pro-environmental attitudes.

This kind of multi-faceted contextual view can certainly be applied to other environmentally responsible behavior as well. Studies that investigate non-pro-environmental factors influencing people's choices in buying eco-friendly vehicles and eating organic food could benefit from integrating non-pro-environmental factors into their frameworks in order to obtain a fuller picture of people's pro-environmental behavior (Dahm, Samonte, & Shows, 2009; Teisl, Rubin, & Noblet, 2008).

6.1.2 Ecological psychology framework:

This project was conducted from an ecological psychology standpoint that regards people and their environment as a system rather than as separate. To my knowledge, ecological psychology has been rarely adopted as a framework or method for environmentally responsible behavior research. Using this perspective I was able to understand people's thoughts and actions more holistically. Also, rather than dissecting people's knowledge, attitudes, and behaviors in a fixed time and location, I looked into their development, history, and trajectory of change. By following people's life stories, I came to realize that not only do people act very differently at different places, but their thoughts and actions can change at different times.

The ecological psychology perspective allowed me to understand people's

complex connections with different domains of contexts, as well as their potentials to change. It is also the systematic view of ecological psychology that urged me to examine not only characteristics of the people, but to go to their homes and workplaces to investigate the influences of these settings. The use of the concept of affordances helped me disentangle the relationship between people and the different settings of their actions. This dissertation demonstrates that an ecological psychological perspective can be very helpful to obtain a holistic understanding of pro-environmental behavior in its contexts.

6.1.3 Bridging the micro and the macro

As Reid and colleagues clearly pointed out, "current pro-environmental behavior studies are symptomatic of societal change, but cannot be fully understood or effectively tackled because of the weaknesses of dichotomous thinking, which has tended to focus predominantly on the micro or macro level. (Reid et al., 2010, p. 323)" By macro level, they meant the regional or national level of investigation, mostly appearing in the sociological literature. By micro level they refer to the approach of understanding individuals, mostly found in psychological research. Different from their proposal of using the household as a unit, my research used individuals' transnational experiences to bridge the macro and the micro. Through people's narratives, we can see how macro influences are translated into personal perceptions and even further into actions. The influences of the macro environments may not be detected by individuals if they had not moved from one nation to another. My research provides a channel for macro-level issues to be examined and discussed in micro scale.

In addition, my research pointed out how the strength of macro-level influences can inspire people to recycle more and to live a greener life. Germany's Packaging

Ordinance is one of the macro forces that made this happen. As in Courtenay-Hall and Rogers' critiques, current environmentally responsible behavior studies tend to privatize environmental actions; i.e.: we pay much more attentions to the private sphere and shift the burden of responsibility away from nations, corporations, and global political agreements (Courtenay-Hall & Rogers, 2002; Sandilands, 1993). I hope that influences of the research will serve as an example of how to better balance the focus and bring more discussion of the influence of the public sphere on the behavior of individuals.

6.2 Limitations of the study

This study has a number of limitations due to its exploratory nature of using relocation as a means to examine contextual factors. One of the limitations is due to convenience sampling. With the wide variety in many variables involved such as the duration of living in the host country, the purpose of relocation, the demographics profiles of the participants, the location of the neighborhood, and the types of residence. If the resources had been available, this study could have benefitted from a more focused sampling, such as only targeting people who relocated 3 to 5 years to the study who lived in apartment buildings. It would also been useful to have more selection criteria at the start of my interviews, but this was not possible with the relatively small population (Germans and Americans are minor immigrants in NYC and Munich, respectively) and a fairly intrusive research method (some people did not feel comfortable being interviewed in their homes and having pictures taken of the garbage arrangement in their kitchen. Moreover, since the proper criteria of selection were mostly unknown at the start due to the innovative research design, this limitation can be seen as an opportunity to improve future research.

Another constraint of this research is the lack of a common measurement of participants' environmental awareness and pro-environmental behavior. This study could have used a supplementary questionnaire or survey to assess each participant's general environmental attitude and behavior such as the New Ecological Paradigm scale (Dunlap, Van Liere, Mertig, & Jones, 2000.) This would have provided information to better align the findings with the current psychological literature.

6.3 Policy recommendations for New York City and beyond

One area where I hope my dissertation can contribute is to make policy recommendations that will not only encourage people to recycle more but also help them become more aware of consumption and consider opportunities to reduce and reuse. I have also learned that good environmental policies work beyond increasing the recycling rate—they also contribute to establishing people's trust in the government, which may eventually have a greater impact on other related issues too. Even though the recommendations below are somewhat customized for New York City, many of them also have great potentials for application to other localities.

Integrate information into residents' life spaces:

Although the NYC government includes detailed information on its website and provides many informative fliers, magnets, stickers and posters, this ample information, unfortunately, is not actually integrated into people's daily life, especially among newcomers. For instance, it would be very effective if recycling information were part of the "orientation" material for new immigrants and homeowners etc. This idea can work both in institutional and residential settings; for example, as one of the research

participants suggested, recycling information could be included in the package that USPS send about "knowing your neighborhood" when people go there to change their address or set up mail forwarding. The same concept can also be used in school and office settings: it is easier for newcomers to be oriented to available recycling programs in the building. It will also be more effective to integrate appropriate waste disposal habits

On the building level- working with superintendents:

In the course of my research including some building visits in pilot studies, I went to many apartment buildings and looked at their recycling area. I found a very wide variety in the quality of recycling information provided there. Some buildings had clear signs and posters that indicate which item goes where, while information in other buildings were vague and incomplete. Since handling garbage and recycling are mostly in the superintendents' hands, it can very effective if the outreach can start at the superintendent level.

Greater consistency in affordances between different settings for recycling

My research suggested that the consistency in Germany's recycling system not only helps people recycle more conveniently but also establishes their trust in government that recycling is taken seriously. More consistent recycling containers in public space will help people to establish a waste disposal scheme that matches the ones they have at home, which will then stabilize their recycling behavior. In addition, the placement of recycling bins should be adjacent to general waste receptacles-- when people dispose of something, all the choices will be presented at the same time.

More information on the destination of collected recyclables:

Knowing where recyclables go makes people feel their efforts are worthwhile.

Providing more information on the destination of recyclables will help to motivate those who are skeptical about the recycling business.

Re-structure the garbage fee

The last suggestion might be a long shot, but economic incentives not only influence people's behavior but also make people understand that garbage disposal comes with a price. People make more efforts to separate garbage if they have to pay in proportion to the quantity of their non-recyclable trash.

6.4 Conclusion

This dissertation displayed the complexity in people's pro-environmental attitudes and behavior. The project did not aim at describing comprehensively what people *are*, but rather examined and explored the potentials of what people *can become.* By presenting a model of multi-dimensional recycling orientations, I hope that this dissertation will help eliminate the stereotyping recyclers versus non-recyclers. Also by adopting a framework that included different domains of contexts, I hope this study will help shift the focus to consider more meso and macro level analyses. And finally, by following people's trajectories in as environmental actors, I hope that my study will inspire further research to look more into development than results--- on how today's process can be tomorrow's outcomes.

Appendix A: A flyer used for recruiting research participants

If you moved from USA to Germany….

Have you been confused with ***what to recycle here?***

Or ever wondered *why do we have to recycle*?

Come and participate a doctoral student's recycling research, if you are:

- American adult,
- Living in Munich for more than 3 months,
- Living in a residential setting (not in a hotel), and
- The main handler (or one of the main handlers) of your household garbage

Your participation is highly appreciated!

If you are interested in talking about your experiences and thoughts of recycling and relocation, or would like to know more about this research, please contact:

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Appendix B: Interviews protocols

1) **Opening question:**

How do you think of garbage in your life? (Prompt: you can also recall any peculiar moments when you thought of waste. It could be anytime in your life: your childhood, when you first moved to Munich/NYC, or any other moments you think of.)

2) **Garbage disposal and recycling**

   a) Can you tell me and/or show me how do you *usually* recycle in your place? (Do you put the garbage in different bags before disposal? Do you separate recyclables from other garbage?)

   b) (in NYC) What are the pick-up days for regular trash and recyclables, accordingly?

   (in Munich) How often do you go to the recycling drop-off site? How far are they from your home?

   c) Do you find it rather easy or difficult to separate recyclables from garbage in your home? How do you arrange your space?

   d) In your household, how do different family members cooperate on handling household waste and recycling? Is (or was) there any issues or problems you encounter(ed)?

   e) What are other difficulties you have experienced in household recycling?

3) **Let's talk about the place(s) where you lived before….**

   a) How long have you been living in Munich/New York City? How old were you then?

   b) Where did you live before?

   c) What were the recycling programs in those places? If there wasn't any recycling program, what did you do with your resourceful garbage?

   d) Did you know anything about recycling program, or other environmental practices in Munich/NYC before you came here? (follow-up questions: how did you know, and how did you expect yourself to adapt?)

   e) How did you know of the recycling policy when you first moved into Munich/New York?

   f) Can you tell me the similarities and/or differences of recycling programs in the places you lived before, compared with the recycling program in New York City?

   g) Do you think moving to a new city/country had any influence on your recycling habits or your thoughts/concepts on recycling, and/or other environmentally-friendly thoughts?

   h) Do you plan to go back to USA/Germany? If so, do you expect any of your recycling thinking/behavior to be different in any way? (why or why not)

4) **Let's talk about different places you go, and the associated recycling scenarios….**
   a) Where do you work? How is the recycling program in practice in your work place?
   b) Do you recycle differently at home and at work/ school?
   c) If so, why is that?/ If not, do you feel the same amount of control/ autonomy in terms of recycling when you're at home versus at work/school?
   d) Let's move on to the public places: what are your experiences in disposing garbage and recycling in public spaces, for example, in the park, in the subway, on the street…etc?

5) **Other scenarios / stories of "environmental irresponsibility"**
   a) Do you always recycle (or never recycle) as you wish?
   b) What are the occasions that you want to recycle but don't? (what makes you not to recycle for those occasions? *What kind of factors will affect you to make the decision?*)
   c) Tell me some stories (if you can) in when and why you struggle when throwing away something/ trying to recycle something; what is/was your struggle, and how did you develop a strategy to handle those scenarios.
   d) Do those strategies differ when you're at different places? Do they differ when you have different of available time? Or did they evolve over time?

6) **Recycling / environmental issues**
   a) When did you first learn about the concept or recycling? How and what did you learn?
   b) Do you think recycling is important? Why or why not?
   c) Why do (or don't) you recycle?
   d) Do you know what happens to the recyclables after they are picked up? (Possibly encourage people to talk about what they think should happen, and what they think really happens.)
   e) (Alternative prompting question to d): do you know where your recyclables end up and what the steps are that get them there?
   f) Do you think of recycling as an environmental issue? If so, why?
   g) In addition to recycling, what are the other things you do that you consider as environmentally-friendly?
   h) Among those things you just mentioned, how would you rank them in terms of importance to the world, and in terms of convenience for you?
   i) Why do we recycle now when we didn't do so in the past?
   j) Do you think that there are alternatives to recycling in today's society?

Appendix C: Demographics of selected participants

ID	Participant	Gender	Age	Years of residence [38]	Occupation
M01	Bad Doggie	Male	41	6	Bar manager/ Computer
M03	Virginia N.	Female	40	3	Business
M04	Randy C.	Male	45	8	Research scientist
M06	Lucinda S.	Female	53	8	Housewife
M09	Greta	Female	21	1	College student
M12	David Z.	Male	63	13	Writer
M13	Tina R.	Female	37	14	Financial consultant
M16	Sarah J.	Female	21	1	College student
M17	Abel C.	Male	47	17	Project consultant
M18	Audrey R.	Female	37	5.5	Chemical engineer
M20	Jenny	Female	29	2.5	Computer programmer
M21	Cassie H.	Female	33	3	Teacher
M29	Melanie H.	Female	32	1.5	Systems engineer
M30	Lisa Y.	Female	39	2	Bookstore owner
N02	Karl R.	Male	46	11	Professor
N03	Sebastian W.	Male	30	3.5	Graduate student
N04	Kai H.	Male	35	15	Website designer
N05	Hejo M.	Male	56	2	Retired. bookstore volunteer
N06	Sabina K.	Female	39	12	Creative Consultant
N07	Eckart G.	Male	37	3.5	Architect
N08	Barbara S.	Female	38	5	art historian and editor
N10	Stefanie H.	Female	35	9.5	IT, Goethe Institute
N11	John B.	Male	25	2	Graduate student
N12	Elke N.	Female	57	12	Professor
N14	Tobias R.	Male	48	7	Graduate student

[38] Years of residence in the host countries. The number of years is rounded to the nearest half year.

Appendix D: List of codes

acquiring recycling knowledge
adjust
affordance
  affordance: informational
  affordance: physical
  affordance: physical: distance
  affordance: social
battery
biking
bottle deposit/ Pfand
capitalism
change: behavior
change: other people
change: prediction
change: thoughts
childhood
community
comparison: Germany vs US
comparison: within self
compost/ Biotonne
confusion/ unclear
consequences of not recycling
convenience
design
destination of recyclables
development of environmental consciousness
doubt/suspicion
easy/convenient
economic
economy
education
education: family
education: public
education: school
efficiency
effort
emotion
energy-saving
environmental consciousness
environmental cost/benefit
environmental cultures
ERB: other
experiences of visiting back home
fridge
garbage narratives
garbage volume
Gelbesach
government
Gruene Punkt
guilty
habit
impact of relocation
incentive: financial
knowledge
landfill/garbage
liberation
lifestyle
media
mentality
motivation

- neighbor
- normal, norms
- other abroad experiences
- packaging
- plastic recycling
- policy/politics
- prior knowledge of recycling in host country
- public space
- public transportation
- RB (Recycling Behavior)
  - RB-always
  - RB-material
  - RB-separating description
  - RB-spatial
  - RB-temporal
- reasons for moving
- recycling center
- recycling history
- recycling suspension
- reduce
- reflection
- resource
- responsibility
  - responsibility: manufacturer
  - responsibility: social
- reuse
- RNR (Reasons for Not Recycling)
  - RNR-cost-effective
  - RNR-distance
  - RNR-doubt
  - RNR-environmental
  - RNR-inseparatable material
  - RNR-lack knowledge/confusion
  - RNR-mixed afterwards
  - RNR-no program
  - RNR-no shredder
  - RNR-quantity
  - RNR-space
- RR (Reasons for Recycling)
  - RR-clean/reduce garbage
  - RR-economic-self
  - RR-education
  - RR-environmental
  - RR-feel good
  - RR-habit
  - RR-material value
  - RR-norm
  - RR-overall
- RR-rule/law
- rule-governed
- shopping bags
- social pressure
- suggestion for recycling
- time
- travel
- trust
- water consumption
- workplace

References

Ackerman, F. (1997). *Why do we recycle?: markets, values, and public policy*. Washington D.C.: Island Press.

Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior: attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*, *22*, 453-474.

Allen, J. B., & Ferrand, J. L. (1999). Environmental Locus of Control, Sympathy, and Proenvironmental Behavior: A Test of Geller's Actively Caring Hypothesis. *Environment and Behavior*, *31*(3), 338-353.

Altman, I., & Rogoff, B. (1987). Worldviews in Psychology: trait, interactional, organismic and transactional perspetives. In Daniel Stokols & Irwin Altman (Eds.), *Handbook of Environmental Psychology* (pp. 7-40). Toronto: John Wiley & Sons.

Ashkin, M. (2002, March 19). The Recycling Ethic. *New York Times*. Retrieved from http://www.nytimes.com/2002/03/19/opinion/l-the-recycling-ethic-128708.html?src=pm

Bamberg, S. (2003). How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of Environmental Psychology*, *23*(1), 21-32.

Barab, S. A., & Roth, W.-M. (2006). Curriculum-Based Ecosystems: Supporting Knowing From an Ecological Perspective, *35*(5), 14-23.

Barker, R. G. (1968). *Ecological psychology: concepts and methods for studying the environment of human behavior*. Stanford University Press.

Barr, S., Ford, N. J., & Gilg, A. W. (2003). Attitudes towards Recycling Household Waste in Exeter, Devon: quantitative and qualitative approaches. *Local Environment*, *8*(4), 407.

Berger, I. E. (1997). The demographics of recycling and the structure of environmental behavior. *Environment and Behavior*, *29*(4), 515-531.

Bloomberg. (2002, February 13). Mayor Michael R. Bloomberg's Presentation of Preliminary Budget for Fiscal 2003. *New York City Office of Management and Budget*. Retrieved from http://www.nyc.gov/portal/site/nycgov/menuitem.b270a4a1d51bb3017bce0ed101c789a0/index.jsp?pageID=nyc_blue_room&catID=1194&doc_name=http%3A%2F%2Fwww.nyc.gov%2Fhtml%2Fom%2Fhtml%2F2002a%2Fbudget_2003.html&cc=unused1978&rc=1194&ndi=1

Bronfenbrenner, U., & Crouter, A. C. (1983). The evolution and environmental models in developmental research. In W. Kessen (Ed.), *Handbook of Child Psychology* (Vol. 4, pp. 357-414). New York: Wiley.

Burn, S. M. (1991). Social psychology and the stimulation of recycling behavior: the block leader approach. *Journal of Applied Social Psychology, 21*, 611-629.

Burn, S. M., & Oskamp, S. (1986). Increasing Community Recycling with Persuasive Communication and Public Commitment. *Journal of Applied Social Psychology, 16*(1), 29-41. doi:10.1111/j.1559-1816.1986.tb02276.x

Chawla, L. (1999). Life Paths Into Effective Environmental Action. *The Journal of Environmental Education*, *31*(1), 15-26. doi:10.1080/00958969909598628

Chu, P.-Y., & Chiu, J.-F. (2003). Factors Influencing Household Waste Recycling

Behavior: Test of an Integrated Model. *Journal of Applied Social Psychology*, *33*(3), 604-626.

Clark, C. F., Kotchen, M. J., & Moore, M. R. (2003). Internal and external influences on pro-environmental behavior: Participation in a green electricity program. *Journal of Environmental Psychology*, *23*(3), 237-246. doi:10.1016/S0272-4944(02)00105-6

Courtenay-Hall, P., & Rogers, L. (2002). Gaps in Mind: problems in environmental knowledge-behaviour modelling research. *Environmental Education Research*, *8*(3), 283-297. doi:10.1080/13504620220145438

Dahlstrand, U., & Biel, A. (1997). Pro-Environmental Habits: Propensity Levels in Behavioral Change. *Journal of Applied Social Psychology*, *27*(7), 588-601.

Dahm, M., Samonte, A., & Shows, A. (2009). Organic Foods: Do Eco-Friendly Attitudes Predict Eco-Friendly Behaviors? *Journal of American College Health, 58*(3), 195-202. doi:10.1080/07448480903295292

Derksen, L., & Gartell, J. (1993). The Social Context of Recycling. *American Sociological Review*, *58*(3), 434-442.

De Young, R. (1986). Some Psychological Aspects of Recycling. *Environment & Behavior*, *18*(4), 435-449.

Dolnicar, S., & Grün, B. (2009). Environmentally Friendly Behavior: Can Heterogeneity Among Individuals and Contexts/Environments Be Harvested for Improved Sustainable Management? *Environment & Behavior, 41*(5), 693-714. doi:10.1177/0013916508319448

Duffy, S., & Verges, M. (2008). It Matters a Hole Lot: Perceptual Affordances of Waste

Containers Influence Recycling Compliance. *Environment & Behavior*, *41*(5), 741-749.

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New Trends in Measuring Environmental Attitudes: Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale. *Journal of Social Issues*, *56*(3), 425-442. doi:10.1111/0022-4537.00176

Dwyer, W. O., Leeming, F. C., Cobern, M. K., Porter, B. E., & Jackson, J. M. (1993). Critical review of behavioral interventions to preserve the environment: Research since 1980. *Environment and Behavior*, *25*(3), 275-321.

Ericksen, J., & Jackson-Smith, D. (2005). Reversing the attitude-behavior relationship: changes in recycling attitudes through exposure to a structured recycling program. *Waste: The Social Context (2005)*, 180-189.

Fishbein, B. K., & Azimi, S. L. (1994). *Germany, Garbage, and the Green Dot: Challenging the Throwaway Society*. Inform.

Fishbein, M., & Ajzen, I. (1975). *Belief attitude intention and behavior: an introduction to theory and research*. Reading, MA: Addison-Wesley.

Gamba, R. J., & Oskamp, S. (1994). Factors influencing community residents' participation in commingled curbside recycling programs. *Environment & Behavior*, *26*, 587-612.

Gandy, M. (1993). *Recycling and Waste : An Exploration of Contemporary Environmental Policy*. Ashgate Publishing.

Gandy, M. (1994). *recycling and the politics of urban waste*. New York: St. Martin's Press.

Geller, E. S. (1985). The behavior change approach to litter management. *Journal of Resource Management and Technology, 14*, 117-122.

Geller, E. S., Brastead, W., & Mann, M. (1980). Waste receptacle designs as interventions for litter control. *Journal of Environmental Systems, 9*, 145-160.

Gibson, J. J. (1979). *The Ecological Approach to Visual Perception*. Erlbaum, Lawrence Associates.

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory*. Chicago: Aldine.

Granzin, K. L., & Olsen, E. J. (1991). Characterizing Participants in Activities Protecting the Environment. *Journal of Public Policy & Marketing, 10,* 1-27.

Grendstad, G., & Selle, P. (1995). Cultural theory, postmaterialism and environmental attitudes. *Culture matters : essays in honor of Aaron Wildavsky.* Bergen: Norsk senter for forskning i ledelse organisasjon og styring.

Guagnano, G. A., Stern, P. C., & Dietz, T. (1995). Influence of attitude-behavior relationships: A natural experiment with curbside recycling. *Environment & Behavior, 27*(5), 699-718.

Hardin, G. (1968). The tragedy of the commons. 1968. *Science*, *162*(3859), 1243–1248.

Heft, H. (2001). *Ecological Psychology in Context : James Gibson, Roger Barker & the Legacy of William James's Radical Empiricism*. Erlbaum, Lawrence Associates.

Hormuth, S. E. (1990). *The ecology of the self : relocation and self-concept change*. Cambridge: New York.

Howenstine, E. (1993). Market Segmentation for Recycling. *Environment and Behavior*, 86 -102. doi:10.1177/0013916593251004

Hsieh, T.-S. (2004). To Recycle Or Not To Recycle? Analyzing The New York City's

Recycling Program Suspension. *Interdisciplinary Environmental Review*, *IV*(1).

Kaiser, F. G., & Wilson, M. (2000). Assessing People's General Ecological Behavior: A Cross-Cultural Measure. *Journal of Applied Social Psychology*, *30*(5), 952-978.

Katzev, R., Blake, G., & Messer, B. (1993). Determinants of participation in multifamily recycling programs. *Journal of Applied Social Psychology*, *23*(5), 374-385.

Knussen, C., & Yule, F. (2008). "I'm Not in the Habit of Recycling". *Environment & Behavior*, *40*(5), 683-702. doi:Article

Kollmuss, A., & Agyeman, J. (2002). Mind the Gap: why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, *8*(3), 239-260.

Kurz, T. (2002). The Psychology of Environmentally Sustainable Behavior: Fitting Together Pieces of the Puzzle. *Analyses of Social Issue and Public Policy*, *2*(1), 257-278.

McDonough, W., & Braungart, M. (2002). *Cradle to Cradle*. New York: North Point Press.

McKenzie-Mohr, D., Smith, W., & Smith, W. A. (1999). *Fostering sustainable behavior: an introduction to community-based social marketing*. New Society Publishers.

Mee, N., Clewes, D., Phillips, P. S., & Read, A. D. (2004). Effective implementation of a marketing communications strategy for kerbside recycling: a case study from Rushcliffe, UK. *Resources, Conservation and Recycling*, *42*(1), 1-26. doi:10.1016/j.resconrec.2003.12.003

Neumayer, E. (2004). The environment, left-wing political orientation and ecological economics. *Ecological Economics*, *51*(3-4), 167-175.

doi:10.1016/j.ecolecon.2004.06.006

Olofsson, A., & Ohman, S. (2006). General Beliefs and Environmental Concern: Transatlantic Comparisons. *Environment and Behavior*, *38*(6), 768-790. doi:10.1177/0013916506287388

Pajo, J. (2008). *Recycling culture: Environmental beliefs and economic practices in post-1990 Germany*. University of California, Irvine, United States -- California.

Reid, L., Hunter, C., & Sutton, P. (2009). Writing it down: suggestions for a new approach towards understanding pro-environmental behaviour. *International Journal of Sustainable Development & World Ecology*, *16*(6), 369-373. doi:10.1080/13504500903320342

Reid, Louise, Sutton, Philip, & Hunter, Colin. (2010). Theorizing the meso level: the household as a crucible of pro-environmental behaviour. *Progress in Human Geography*, *34*(3), 309-327. doi:10.1177/0309132509346994

Reschovsky, J. D., & Stone, S. E. (1994). Market incentives to encourage household waste recycling: paying for what you throw away. *Journal of Policy Analysis and Management*, *13*(1), 120-139.

Rise, J., Thompson, M., & Verplanken, B. (2003). Measuring implementation intentions in the context of the theory of planned behavior. *Scandinavian Journal of Psychology*, *44*(2), 87-95.

Sandilands, C. (1993). On“ Green” Consumerism: Environmental Privatization and“ Family Values.” *Canadian Woman Studies*, *13*(3).

Schultz, P. W., Oskamp, S., & Mainieri, T. (1995). Who recycles and when? A review of personal and situational factors. *Journal of Environmental Psychology*, *15*(2),

105-121.

Staudt, E., & Schroll, M. (1999). The German Packaging Ordinance: The Questionable Effects of a Fragmentary Solid Waste Management Approach. *Journal of Material Cycles and Waste Management*, *1*(1), 17-24.

Teisl, M. F., Rubin, J., & Noblet, C. L. (2008). Non-dirty dancing? Interactions between eco-labels and consumers. *Journal of Economic Psychology, 29*(2), 140-159. doi:10.1016/j.joep.2007.04.002

Tierney, J. (1996). Recycling Is Garbage. *The New York Times Magazine*.

Vining, J., & Ebreo, A. (1990). What makes a recycler? A comparison of recyclers and nonrecyclers. *Environment & Behavior, 22*, 55-73.

Wang, T. H., & Katzev, R. D. (1990). Group commitment and resource conservation: two field experiments on promoting recycling. *Journal of Applied Social Psychology*, *20*(265-275).

Wapner, S. (1987). A holistic, developmental, systems-oriented environmental psychology: Some beginnings. In D. Stokols & I. Altman (Eds.), *Handbook of environmental psychology* (pp. 1433-1465). New York: Wiley.

Weinberg, A. S., Pellow, D. N., & Schnaiberg, A. (2000). *Urban recycling and the search for sustainable community development*. Princeton: Princeton University Press.

Winkel, G., Saegert, S., & Evans, G. W. (2009). An ecological perspective on theory, methods, and analysis in environmental psychology: Advances and challenges. *Journal of Environmental Psychology, 29*(3), 318-328.