ANALYZING THE TOOL OF EMPOWERMENT TO IMPROVE THE HEALTH OF VANCOUVER'S BINNING COMMUNITY

by

E. Jade Yehia

PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

Bachelor of Technology in Environmental Health

(Photo of an alleyway in the Downtown Eastside, taken by Tremblay 2007)

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

June 2008

"The view expressed in this paper are those of the author and do not necessarily reflect the official policy, position or view of BCIT, the Environmental Health Program or its faculty."

I. ABSTRACT

In the summer of 2007 a research project was conducted to analyze the socio-economic status and recycling habits of the dumpster diving community in Vancouver, British Columbia, Canada. This research, carried out by the City of Vancouver, was considered when amending the municipal Solid Waste By-law to permit the locking of dumpsters and to evaluate its impact on "binners" who rely on informal recycling for their livelihood. Due to the strain of changing municipal by-laws as well as many other issues "binners" have adapted by establishing partnerships with businesses to facilitate the activity of resource recovery.

This project compared "binners" who have established partnerships with businesses (n=20) and those without (n=30) in order to examine each groups' perceived health. Dumpster divers were randomly surveyed at bottle depots using a face-to-face questionnaire and the results of this survey were interpreted with a chi square statistical analysis. The objective of this project was to examine business partnerships, as a tool of empowerment, and its relationship on the perceived health of Vancouver's "binning" community.

There was no statistically significant association ($p = 0.4$) between the perceived health of "binners" who have established partnerships and those without. However due to a small sample population and limited resources a more in depth assessment must be carried out before conclusions can be made. The lead investigator's observations suggest that empowerment can be successfully used as a tool to improve the health of "binners." The health hazards that these individuals encounter daily are infinite but dumpster divers with partnerships have an increased potential to avoid dangerous exposures.

DEDICATION

I would like to dedicate this paper first and foremost to the "binners" that participated in this research. Their willingness to persevere should be an inspiration to all. Even though they found themselves on the margins of society their environmental contribution should be recognized and encouraged rather than frowned upon. Second, I must thank Crystal Tremblay for her insight and consultation. She truly was the driving force behind my work. Third, I would like to recognize my advisor Helen Heacock; she encouraged me to pursue this project and her expertise was invaluable. I must also express my heart felt thanks to my mother who listened to me while I pondered the vastness of these results. Finally, I am eternally grateful for the wonderful people in my life that have allowed me to feel the compassion necessary to carry out this research.

TABLE OF CONTENTS

XII. LIST OF FIGURES

II. INTRODUCTION

A. STATEMENT OF THE PROBLEM

In the summer of 2007 a research project was conducted by the City of Vancouver (British Columbia) to look at the dumpster diving community (also known as "binners") who reside in the region. Dumpster divers are identified as individuals who scavenge for resources, such as bottles, food, and clothing, in the waste stream. The rationale behind the investigation of this community was to assess the "scope and dimension of these individuals in order to accurately make conclusions regarding proposed street cleaning initiatives" (Sheel, 2007). City council has recently made several recommendations and amendments, due to the impending 2010 Olympics, and one such change is to the Solid Waste By-law. This law enforces that problem waste containers must be locked (City Council meeting, 2006), i.e. bins that are constantly a mess, are overflowing, or prone to illegal activity. In addition, Vancouver's "two largest commercial waste collectors, Waste Management and BPI, are already starting to lock their bins" (Dale *et al.*, 2006) and many residential buildings have done the same in hopes of reducing dumpster diving activity.

B. PURPOSE OF THE STUDY

Community run projects, endorsed by the City of Vancouver, are taking dumpster divers into consideration in hopes of creating solutions to all stakeholders involved, i.e. citizens and divers alike. The creation of the United We Can bottle depot, located in Vancouver's impoverished Downtown Eastside (DTES), was built and is operated by dumpster divers, catering to recycling activity. Another such project is the urban binning

unit (UBU), a specially designed cart to facilitate quiet and effortless recyclable collection, based at the United We Can depot. These initiatives are among some of the projects the City is involved in to target this community. This research project complements results of the 2007 study (Tremblay) by specifically addressing perceived health issues of dumpster divers.

III. LITERATURE REVIEW

This review investigates the current literature on the dumpster diving community in the City of Vancouver by first explaining the existing terminology that persists. Second, the articles and journals devoted to these individuals are mainly confined to the developing world, thus the international field is explored and how it compares to the developed world. Third, the focus tightens to a local level where the study was confined, Vancouver. Finally, this subculture is put under the microscope and the issues that directly impact these individuals are evaluated, one area of greatest concern is health and the strategies to improve it. In summary, there are many issues affecting the dumpster divers' quality of life – integrating, empowering, and providing these individuals a means to participate in society may be the easiest route to improve it.

A. DEFINING THE BINNER COMMUNITY

Before even beginning to discuss the breath of this projects' objective one must first understand the stage in which this research was set. It is a familiar scene, one in which most urban dwellers are conditioned to see regularly, the sight of homeless poor individuals diving into garbage bins searching for cans, bottles, or whatever else, in order to sustain themselves. These people identify themselves as a variety of terms including binners, scavengers, dumpster divers, scroungers, urban recyclers, waste pickers, (even

one binner identified himself as an urban treasure hunter). Technically the term binning, i.e. informal resource recovery, is defined as "the collection of recyclable beverage containers, food, clothing, and other items of value" (Tremblay, 2007) from dumpsters, garbage cans, and recycle bins (more commonly referred to as blue boxes in the Province of B.C.). "The increase of recyclables in the final waste stream makes dump picking worthwhile" (Furedy, 1993) and when coupled with poverty and homelessness this activity persists. This is apparent in even the most affluent municipalities of the world, such as is seen in the City of Vancouver.

B. SCAVENGING IN THE DEVELOPING VERSUS DEVELOPED NATIONS

"Informal waste management is a reality in perhaps the entire developing world and in many of the wealthier nations as well, although academic work on the topic generally consists of place and time specific case studies" (Nas and Jaffe, 2002) confined to Third world countries where whole communities of binners are established. The prevalence of urban recyclers in these nations is numerous and the research focuses on these areas because of the myriad of health and societal concerns that subsist. This issue is present in the developed world but is not as noticeable and dire in their developing counterparts. "On the whole, research done on scavenging and informal waste management systems is very limited, with only a scattering of true fieldwork done throughout the world, mainly in Indonesia, Egypt, Colombia, the Philippines and Brazil" (Nas and Jaffe, 2002).

The advent of the environmental movement is worldwide, along with growing waste generation, and waste picking is a natural progression. "In both the developed and developing countries, population growth, as well as production and consumption patterns,

has increased rates of solid waste production, creating constraints on the improvement of environmental and human health conditions" (Moreno-Sanchez and Maldonado, 2006). Scavenging is an ingenious solution to battle the worlds waste creation and at the same time aiding desperate individuals to survive. Although, a common theme seen in these global cultures is that urban recyclers are often "ignored when waste management policies are formulated" (Moreno-Sanchez and Maldonado, 2006). With that being said, Vancouver has attempted to change that trend and bring the binners into mind when tabling policies and planning urban development.

C. DUMPSTER DIVING IN THE CITY OF VANCOUVER

In the past, "the informal recovery of recyclables in America has been carried out by scavengers since soon after the arrival of the European settlers" (Medina, 2001) and it is possible to assume that this practice has also been persisting in the City of Vancouver since early settlement. Today, case numbers are finally being recorded and it is estimated that "at least 1500 individuals are regular customers to the United We Can bottle depot, located in the Downtown Eastside" (Tremblay, 2007). The recycled materials are redeemed for cash, which may either supplement the existing income of binners or be their only source of money. This community is only just being assessed; these individuals have been surveyed, documented, and are now getting attention (Tremblay, 2007). Tremblay (2007) revealed that most waste pickers are predominately middle-aged Canadian males and Asian female refugees. The education level of binners ranges from high school dropouts to university educated. Tremblay's research identified that there exists a hierarchy of binners and some individuals called middlemen hold the keys to some of the many locked bins in the city, providing lower level recyclers access at a cost.

Dumpster divers may have designated routes that they take on a day-to-day basis to "stay one stealthy step ahead of the official agencies of collection, sanitation, and disposal" (Ferrell, 2006). "As scavenging through garbage bins remains an illegal activity, their actions are not without confrontation. Frequent encounters with police lead to fines or arrests. Also, "degradation towards this population is a common reaction from the community at large" (Tremblay, 2007).

The current situation in the City of Vancouver, which is the hot topic of debate, is City Council's decision to amend the Solid Waste By-law enforcing problem dumpsters to be locked. In addition, binners are not "permitted to remove any recyclable material from blue bins" and if they contravene this they could be facing a minimum $50.00 fine as outlined in the By-law (enacted January 2007). Another initiative being put forward by Metro Vancouver is the zero waste challenge where policy makers are trying to reduce waste and consumption; for example, as of January 2008 Metro Vancouver residents experienced a change in their sanitary services. "Blue box recyclables are now banned from the garbage" (Metro Vancouver web-site, 2008) therefore binners are limited into what resources they can extract from dumpsters, and if most residents comply with this law, waste pickers could be encountering fines if they chose to dive into blue bins. "The informal recovery of materials from waste represents an important survival strategy for disadvantaged populations throughout the world" (Medina, 2000) so what is going to happen when these individuals are cut off from their livelihood?

D. THE HEALTH OF SCAVENGERS

"Urban recyclers rummage through other people's garbage for items of value to resell" (Rendleman and Feldstein, 1997). Obviously due to the nature of the work, there

are a host of diseases and hazards that they run into on a frequent basis. The hazards are greatly increased depending on their behaviour, e.g. if they solely dive in blue boxes as opposed to dumpsters. In a previous study carried out by Rendleman and Feldstein (1997), on binners in Portland, Oregon, "a high prevalence of severe injuries was found to occur, lacerations, infections, needle sticks, and blunt trauma were all common." To accentuate the problem "recyclers often delay treatment until complications arise" (Rendleman and Feldstein, 1997) requiring visits to clinics and/or emergency rooms. Dumpster divers are often individuals with substance abuse issues, mental health challenges, and compromised immune systems. In the Vancouver survey that was conducted in 2007, it was not uncommon to hear the binners professing ailments such as Hepatitis B and C, staphylococci infections, tuberculosis, and these were conditions they were aware of and felt comfortable telling the researcher. If dumpster divers are positive for disease or require treatment they can incur extensive costs to the health care system. The reality of the situation is where there is poverty and waste, there will be scavenging and these 'occupational injuries' will persist in this community as long as they continue to perform this activity.

"Health educators have focused on empowerment interventions as a major practice strategy to promote health. One key component is the participatory processes engaged in by individuals as they work to improve their quality of life" (Speer *et al.*, 2001). This is a key tool in altering the health of binners and projects such as the UBU and the presence of the United We Can bottle depot are excellent facilitators to test out this theory to see what the binners perceived health state is when working independently or as part of a team. The lack of integration into society can result in reduced feelings of

self worth within these individuals and the focus of this research paper is to look at empowerment as a means to improve the way they feel about their health.

E. THE EFFECTS OF EMPOWERMENT

"The field of health has traditionally placed greater emphasis on individual health behaviours than on community, social, and economic factors that define lifestyle choices to individuals" (Speer *et al.*, 2001). This traditional view is now changing, and modern medicine is shifting to a more holistic approach. "Empowerment is the process of increasing the capacity of individuals or groups to make choices and to transform those choices into desired actions and outcomes" (The World Bank, 2007). The technique of empowerment, to improve the health status of poverty stricken individuals, has been documented and reported in the developing world. The principal focus of this past research has been to change the circumstances of poor individuals in these areas, but little research has been done in the developed countries. General findings reveal "social cohesion is related to intrapersonal empowerment" (Speer *et al.*, 2001). This principle is generally accepted amongst health care professionals except this tool has yet to be extensively investigated. Evaluating the effectivity of empowerment in the informal recycling community is an analysis that has never been made. Nor has a look been taken into how empowerment affects the impoverished people being influenced, and their perception of personal health. It is for this reason that empowerment, and its role on the health of Vancouver's binning community, was evaluated and interpreted in this study.

IV. RESEARCH OBJECTIVE

The objective of this research project was to look at the community of binners in Downtown Vancouver and compare two groups of Canadian male binners: the self-employed independent urban recyclers and the ones that have established partnerships with businesses and residents such as through the community run municipally funded UBU project. A survey was carried out, in early 2008, to assess the binners perceived state of health. Perceived health was explored because acquiring clinical confirmation from the binners would give rise to ethical concerns. The null hypothesis was that there is no association between improved health perception and businesses partnerships. Conversely, the alternative hypothesis was that there is a perceived improvement to health in the socially included urban recycler community. If empowerment is a tool that is being abdicated by the social scientists to alleviate poverty, then why not put it to the test.

V. METHODS

A. INTRODUCTION TO METHODOLOGY

The purpose of this research project was to assess the perceived health of Vancouver's binning community. Urban recyclers with and without business partnerships were interviewed to gain an understanding of how they feel about their health. The author collected surveys from dumpster divers who have and do not have partnerships. A statistical analysis between these groups was performed to assess whether there is an association in their perceived health. In essence, the tool of empowerment, i.e. integrating individuals into society through partnerships, was evaluated and interpreted.

B. DESCRIPTION OF SUBJECTS AND SURVEY METHODOLOGY

For this research project the investigator conducted face-to-face interviews with the binning community that reside in the City of Vancouver. These individuals were surveyed from January to April 2008. The participants were selected at one of the four most heavily trafficked bottle depots in the downtown Vancouver core: United We Can (39 East Hastings), Westside bottle depot (3311 West Broadway), Go-green recycling (7 East 7th Avenue) and Regional Recycling (960 Evans Avenue) as is illustrated in Figure 1. The binners found at these locations were interviewed however due to the nature of the participants involved there were challenges to selecting subjects randomly.

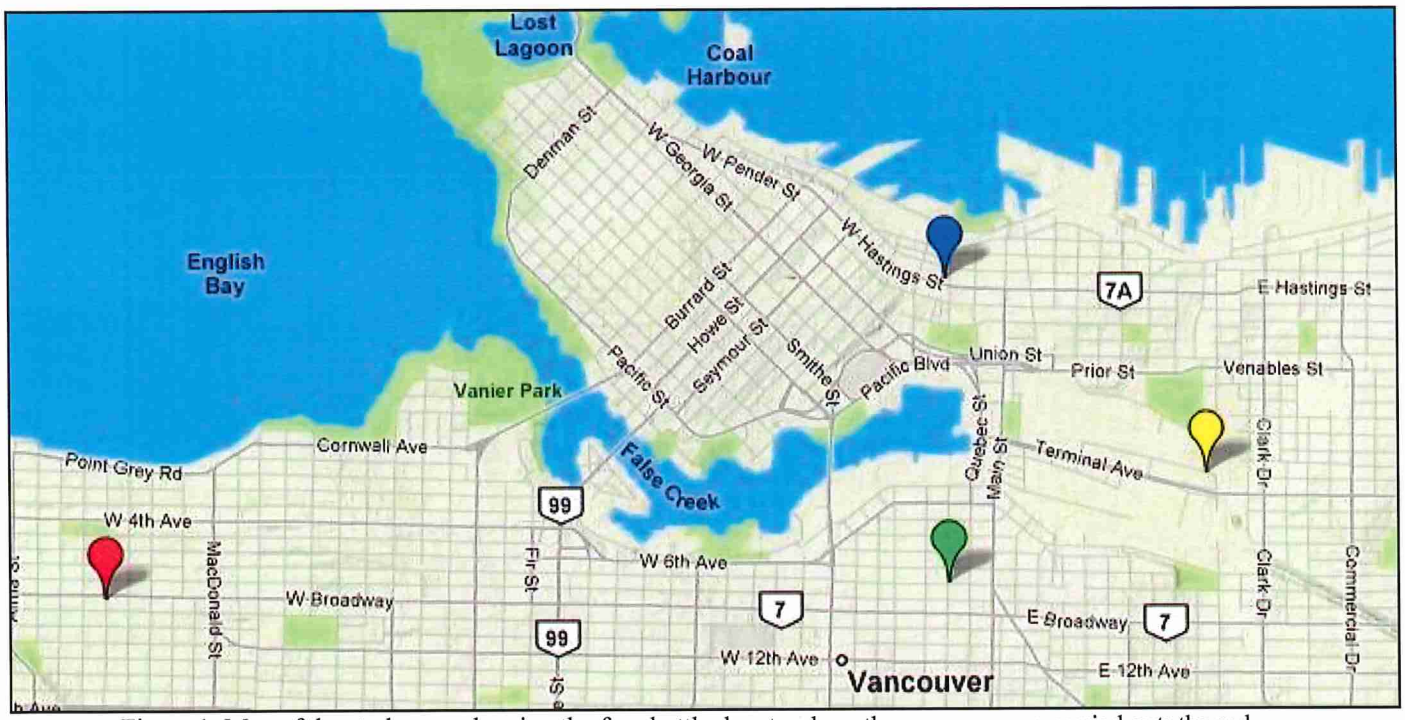


Figure 1: Map of the study area showing the four bottle depots where the surveys were carried out; the red place mark is Westside, the green place mark is Go Green, the yellow marker is Regional and the blue marker is United We Can (Google maps, 2007).

When individuals were first approached a script was used (Appendix A) to recruit volunteers in a uniform manner. Once participants indicated their interest, a consent form, (Appendix B), was distributed and thoroughly explained to ensure that ethical

considerations were met. The ten to fifteen minute questionnaire was then carried out with the participant. The researcher recorded answers provided by the subject and any questions that needed further clarification were explained. A coffee and granola bar was provided to respondents as compensation however participation was entirely voluntary and subjects were free to withdraw from the study at any time.

C. DESCRIPTION OF STANDARD METHODS

The survey carried out in this assessment was created by the principal investigator (Appendix C). "The successful drafting of a questionnaire is as much an art as a science" (Sheskin, 1985) and this was definitely taken into consideration when the survey was developed. The questionnaire used in this study was based on research previously completed with urban recyclers and created by doctoral candidate Crystal Tremblay (2007) from the University of Victoria in B.C. The purpose of Tremblay's research was to assess the socio-economic status of this community and map the resource recovery routes. Tremblay initially surveyed members of the binner community in 2005 for her Master's thesis and then re-interviewed urban recyclers in 2007 for a binning assessment contract with the City of Vancouver. The questionnaire formulated for this research project is fashioned on these surveys and built on the initial findings to target a more in depth analysis of the perceived health of Vancouver's binners. There was no widely accepted standard that this investigation was based on but expands on preliminary research carried out by Tremblay and "interpreted by the City of Vancouver's Waste Management Department" (Sheel, 2007).

D. ALTERNATE METHODS

Alternative methods to the tool, or survey, used in this research project were questionnaires distributed by: mail, telephone, or e-mail. The reason that a face-to-face interview was selected was due to the mobility of the subjects of interest. Most binners do not have a fixed address therefore it was logical to conclude that participants would not have a phone number in which to be contacted or an e-mail address. Thus no other method was appropriate or possible in which to interview subjects because the logistics did not make it feasible for the scope of this survey.

E. JUSTIFICATION FOR METHODS SELECTED

There were a number of challenges associated with the type of individuals who were interviewed, such as: ensuring that participants were honest in their responses. Some binners have mental health issues, are illiterate, abuse substances, and may not have a good mastery of the English language. In past work performed by Tremblay (2007), it was found that 35% of binners are females of Asian background, predominately refugees, from other countries who do not speak English. It was vital to ensure that questionnaires were answered fully and accurately. As a consequence the face-to-face interview was selected and used among a population of Canadian male binners in this study.

F. RELIABILITY AND VALIDITY OF MEASURES

Validity examines "how well an instrument measures what it purports to measure" (Leedy and Ormrod, 2001) and its applicability to other similar situations. The developed questionnaire is a new tool being used to assess Vancouver's binning community and a modified version has only been used on two other occasions, both times

by Tremblay (2007). Problems encountered in the first two surveys were addressed in the questionnaire generated in this investigation. One such example was seen with ambiguous questions or unclear terms hence these questions were omitted in this newly created survey that targets binner health status.

The survey attempted to take into account the principles of reliability: "test re-test and internal consistency" (Leedy and Ormrod, 2001). Tremblay, whose research proved to be very insightful, provided an excellent framework for this study. However, with that being said this survey was not blind to the researcher. The principal investigator was aware of which group each binner fell into, i.e. the ones with and without business partnerships. In an effort to curb this bias a pilot study was carried out with student environmental health officers at B.C.I.T. and Andy Wilkinson coordinator of the Urban Binning Unit project. In addition, it would be challenging to generalize this study to others like it because it is unique to Vancouver's urban recycling community. It may not even be possible to perform this survey on binners in other localities because partnerships with businesses may not be a frequent practice in different areas. As well, the climatic conditions in Vancouver pose fewer challenges than climatic conditions in the rest of Canada during winter months.

G. INCLUSION AND EXCLUSION CRITERIA

The inclusion and exclusion criterion of subjects is based on past work performed by Tremblay (2007). Based on this previous experience and research the binning community is predominately middle aged, and either Canadian males or Asian females. Due to language barriers encountered by the principal researcher, only the adult Canadian male binners were included. Adult was defined as binners older than 18 to avoid

excluding some of the mature binners who have established themselves with business partnerships. It is also a relatively small community where subjects are being drawn from and an even smaller one with the binners who have partnerships. As a result the predominately Canadian, adult (>18 year old), males were surveyed to maintain the scope of data while ensuring that this particular demographic was being analyzed.

H. ETHICAL CONSIDERATIONS

"When humans are used in research ethical implications of their participation is required" (Leedy and Ormrod, 2001). For this research project participants were informed of risks and benefits to volunteering their time. In considering these elements it is apparent that there were no drawbacks to individuals contributing to this survey, as it was only a questionnaire. If binners felt that they did not wish to continue in the study or that any of the questions were too personal they were free to skip the question or discontinue involvement. Research participants at the onset of the study were informed of the nature of the study and were free to make additional inquiries they felt prudent regarding the survey. Subjects were provided a consent form (Appendix A) that detailed: a brief description of the study, what their participation involved, information regarding their participation, their suspected risks and benefits, and the confidentiality of the study (Leedy and Ormrod, 2001). If they agreed they had to sign and date the consent form to identify their willingness to participate thereby taking ethical considerations into account and properly addressing them.

VI. STATISTICAL ANALYSES

A. THE DATA AND SCALE OF MEASUREMENT

The type of data assessed in the survey was nominal because it described the nature of things and can be presented as "percentages or proportions" (Leedy and Ormrod, 2001). The type of the information that was provided by the participants was "qualitative or categorical because they were describing" the quality of how they feel on a scale (Leedy and Ormrod, 2001). Some of the preliminary information that subjects volunteered was standard, such as simple demographics to verify that participants were eligible for the study. Following these questions more in depth data was collected regarding the binners' socio-economic status, recycling habits, and health risks.

B. INFERENTIAL STATISTICS

The chi square test was used to evaluate the relationship between the perceived health of binners compared with individuals that have and do not have business partnerships. "This test is restricted to nominal (frequency) data and is nonparametric" (Schefler, 1979). Due to the nature of items compared, perceived health and business partnerships, it was necessary to separate perceived health into the categories of poor and good. These groupings were established on the basis of a range between 1 and 6 (where 1 = poor health and 6 = good health). The binners themselves answered a question in the survey regarding this range. However the researcher also looked at other variables influencing their lives according to their survey responses.

C. STATISTICAL PACKAGE

The statistical package used to perform the data analysis was the Number Crunching Statistical Software (Hintze, 2001). The NCSS program is a highly reputable data analysis package that provides "easy to use results and graphical interpretation" (Hintze, 2001). "Microsoft Excel is also a powerful tool" (Microsoft, 2003) but is known for its ability to interpret spreadsheets; its data analysis is more of an afterthought therefore it was used to input results during the interim of the study but upon completion the NCSS data analysis package was used to perform the more elaborate statistical test, i.e. chi square.

VII. RESULTS

A. DESCRIPTIVE RESULTS

A complete set of responses to the survey is included in Appendix D although it is necessary to discuss the notable results expressed in Table 1. The average age of binners is approximately 40 to 55 years old for both waste pickers with and without partnerships. In regards to binners with partnerships they are more likely to own (5% of the total group) or rent (30%) their own homes; consequently 60% of these individuals have home access to clean water and sanitary facilities. These socially included scavengers boast a higher level of education with 30% of subjects having some post-secondary schooling. Participants in this group are much more likely to be unemployed (95%) full-time binners that do not collect social assistance (65%). The integrated scroungers are also more prone to wearing protective clothing (70%) while binning and if they injure themselves they are more apt to seek medical attention.

In comparison to the independent individuals 0 % own and only 13% rent a home. Furthermore, these groups' participants are less likely to have a post-secondary education (13% of the total group). These individuals on average spend less time binning, are more likely to have a part-time job (23%) and commonly collect social assistance (83%). In addition, 57% of dumpster divers without partnerships wear gloves although if they are wounded while diving 33% of them would not seek medical attention. These noticeable differences help to provide a look at the bigger picture because it is not only the perspective of the binners that must be considered.

Table 1: Summary of survey responses illustrating differences between the two groups.

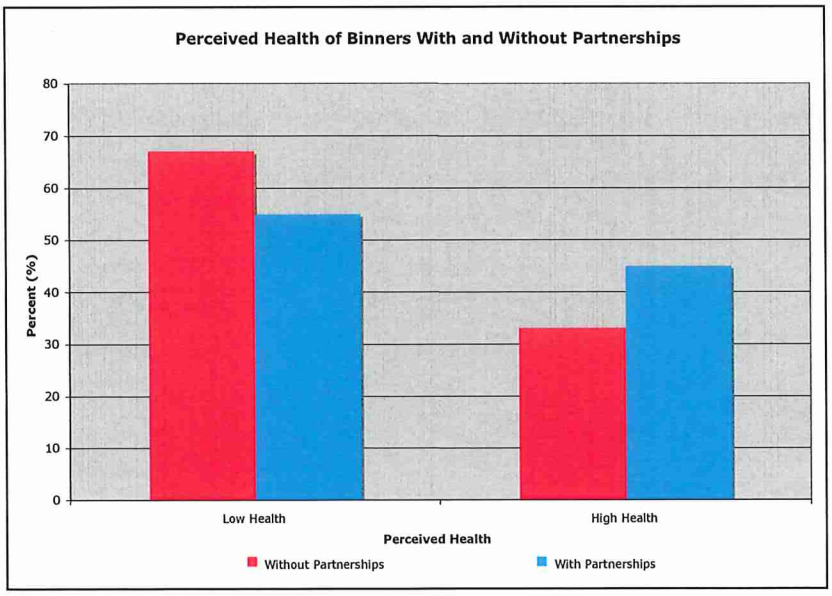
Partnerships		**# With**	**# Without**	**% With**	**% Without**
Housing Situation?	Own	1	0	5	0
	Shelter	0	1	0	3
	Homeless	8	13	40	43
	SRO	5	11	25	37
	Rent	6	4	30	13
	Sub. Housing	0	1	0	3
Level of education?	University	4	4	20	13
	College	2	3	10	10
	High School	14	22	70	73
	Primary School	0	1	0	3
Employed?	Yes	1	7	5	23
	No	19	23	95	77
Collect social assistance?	Yes	7	25	35	83
	No	13	5	65	17
Access clean water and toilets?	Home	12	11	60	37
	Shelter	0	2	0	7
	Other	8	17	40	57
Where do they seek medical attention?	Family Doctor	4	5	20	17
	Drop-in Clinic	3	5	15	17
	Community Nurse	0	2	0	7
	Hospital	9	8	45	27
	They don't	4	10	20	33
Protective Clothing?	Yes	14	17	70	57
	No	6	13	30	43

The focus of this assessment targeted the answer to question 33 (Appendix C) in the survey, which asked how the subject rated his overall health status. The results to this question are tabulated in Table 2. The rows in this table express the number of binners with and without partnerships, where as the columns indicate the number of binners with low and high perceived health. Regarding binners without partnerships (n=30) there are ten who believe they had high health and twenty who do not. For the binners with partnerships (n=20) there are nine that feel they have good health and eleven individuals who do not. Therefore, in reference to the thirty individuals without partnerships 67% feel they have a low health status (Figure 2). Where as, only 55% of the binners interviewed with partnerships perceived their health status to be low (Figure 2).

Table 2: Tabulated results of binners with and without partnerships who participated in the survey and their perceived their health status.

Business Partnerships	**Perceived Health**		**TOTAL**
	Low Health	High Health	
With Partnerships	11	9	20
Without Partnerships	20	10	30
TOTAL	31	19	50

Figure 2: Percentage of urban recyclers with and without partnerships and how they perceive their health.



B. STATISTICAL RESULTS

The chi square test was applied to the binners' self assessed health. The results of this data analysis are found in Appendix E. The degree of freedom is logically 1 because this value "is given by the number of categories minus one" (Schefler, 1979). The chi square value is 0.693 and knowing that along with the degrees of freedom it is possible to calculate the probability level. The probability level (p-value) is 0.405 which is greater than the cut off value of significance of 0.05 therefore the null hypothesis is accepted. According to this data, there is no association between improved perceived health amongst the binner community with business partnerships compared to binners without business partnerships.

Additionally, there were numerous other variables that were statistically analyzed (Appendix E). The p-values for these subsequent tests illustrated no association between business partnerships influence on: the number of hours spent binning, level of education, or access to potable water and sanitary facilities. However, when examining recyclers without partnerships who collect social assistance a p-value of 0.000486 was found signifying a considerable relationship between these two factors. In summary, urban recyclers without partnerships are much more likely to collect social assistance.

VIII. DISCUSSION

A. LIMITATIONS DUE TO STUDY STRENGTH AND ERRORS

The strength of this study was reduced because of the subjective nature of participants' responses. Unfortunately, due to financial constraints, and confidentiality considerations, it was not feasible to acquire laboratory confirmation or conduct a

psychiatric assessment to determine the health status of binners involved in this study. Thus, it was only possible to make assumptions on the basis of participants' responses. As a result of binners assessing their own health there are issues with how forthright they were with their responses. Volunteers may want to please the researcher, thus they may not be honest with their answers; it is also feasible that participants may not entirely understand the questions asked but will respond regardless.

There are a number of extraneous variables that could interject confounding factors into this project and it is not possible to account for them all. There exist variations amongst the binner community, and even within the socially included recyclers. One scavenger reported to regularly pick up bottles for multiple nightclubs garnering approximately $300.00 daily; this particular binner also owned a home and a truck. On the other end of the spectrum are homeless binners who have arrangements with specific residents to casually collect their recyclables. Another piece of the limitation puzzle was the tendency of respondents to say that they have moderate health. Due to this fact health status is separated into two categories: low and high health, however in the survey there are three groups, low, moderate, and high. The majority of respondents stated their health to be moderate and only one binner in each group said that they consider their health to be low. Consequently, the low and moderate health categories are amalgamated introducing an generalized reflection of the reality of how these individuals may truly feel about their health.

There is a potential error in this study, i.e. a type II beta error. A beta error is where the investigator finds that there is no difference between the two groups when in fact there is. The possibility of a beta error occurring in this study is high due to the

small sample population. Therefore, further subjects need to be acquired, in particular the binners with partnerships to accurately make any conclusions; a sample population of twenty is not adequate however there are challenges in finding these individuals such as the fact that many of them do not have a fixed address. These issues presented drawbacks to the power of the study although the remaining results, persisting theories, along with the observations made by the principal researcher open the door for further investigation and call for a more in depth analysis.

B. CONCLUSION

A p-value of 0.406 indicates that there is no scientific association between binner partnerships and improved perceived health however this is not the entire picture. In the group of binners with partnerships there is a 1:1 to ratio amongst the low and high health scroungers; where as for the binners without partnerships there is a 2:1 ratio between binners who feel that they have low health as compared to those with high health. This ratio coupled with other variables that make up their lifestyles, i.e. housing situation, access to water and sanitary services, and whether or not they seek medical attention when needed, will influence the overall state of their health. There is a noticeable trend found with binners who have partnerships as opposed to those without: an improved quality of life. In addition, integrated waste pickers are more prone to be self-sufficient, not relying on social assistance to subsidize their income. In fact a p-value of 0.000486 is found illustrating a strong association between urban recyclers with partnerships NOT being on social assistance. This is a significant value for policy makers to consider when trying to reduce binner reliance on welfare.

Presently, in the City of Vancouver there is a shift in waste management policies and practices. Securing problem dumpsters, fines for scavenging from blue bins, recyclables being banned from the garbage, and the municipalities move to a zero-waste city where dumpsters are a thing of the past, are all pressures that the binning community is facing; thus making resource recovery a challenging activity to carry out. Binners rely on urban recycling to supplement their livelihood and maintain their survival so what is going to happen to these individuals? Will new street cleaning initiatives marginalize this community even more or will they be considered and brought into the folds of 'normal society.' It is possible for the future of scavenging in Vancouver to go in two directions: one where binners are resorting to violence to acquire highly coveted bottles or where dumpster divers are made into models for other destitute individuals to strive to. All scroungers perform a service to the environment by removing recyclables from the waste stream that otherwise find themselves in landfills and incinerators. So why not empower binners to build relationships with the public, they could not only provide this service to the environment but they could also improve their quality of life. They would no longer have to find themselves diving into dumpsters but instead picking up already sorted beverage containers. They would no longer have to encounter the host of occupational hazards that they face daily. Most importantly, binners would feel a sense of belonging by performing an invaluable honest contribution to the environment and to the community as a whole. Happy people are healthy people, at least mentally, and even though it is challenging task to prove that statement scientifically it is a plausible correlation so why not implement this logic.

C. RECOMMENDATIONS

It is the advice of this author that further studies must be carried out with more funding backing these future endeavours. On the basis of the findings in this report empowerment must not be discarded as a tool to improve binner health but should be explored with greater depth to study the full implications. The findings in this research project cannot be confined to the statistics. Even though the results demonstrate no association between partnerships and perceived high health the work was unprecedented. Past studies on the binner community have been focused on the developing world however none have quantified the improved health of these individuals in regards to their private partnerships. This study was meant to be a springboard to launch further work. Only people motivated to change will and numbers can't take away from human experience, compassion, and feelings of self worth. One binner professed that waste picking enabled him to get off drugs. That in itself is an inspiration that could be a driving force for other substance abusers and street dwellers to change their dire life situation. Empowerment is not a band-aid method, implemented lightly, but the benefits to its application are vast. When binners were asked what they felt could improve the activity of resource recovery a large majority asked for an increase in the number of city driven partnerships projects. If the municipality of Vancouver and other urban centres like it consider business partnerships as a means of getting people off the streets the health implications are interrelated. If you can get impoverished scavengers aligned with informal recycling initiatives it could be an inexpensive way to alter the health of a sub community facing extreme health hazards daily. In review, empowerment is a tool that has the potential to help binners get healthy and stay that way.

IX. BIBLIOGRAPHY

City Council Meeting Minutes (2006). Report to Council – standing Committee of Council on city service and budgets.

Dale, A., Waldron, L., and Newman, L. (2006). Community research connections – interactive case studies in sustainable community development. United We Can. Retrieved on October 20, 2007 at http://crcresearch.royalroads.ca/node/324

Ferrell, J. (2006). Empire of scrounge – inside the urban underground of dumpster diving, trash picking, and street scavenging. New York University Press: New York.

Furedy, C. (1993). Working with the waste pickers. *Alternatives* 19(2): 18-23.

Google Maps (2007) Retrieved November 22, 2007 from http://maps.google.ca/maps?hl=en&tab=wl

Hintze, J. (2001). NCSS and PASS. Number Cruncher Statistical System, (Version 2004). Kaysville, Utah: NCSS.

Leedy P. and Ormrod, J. (2001). Practical Research: Planning and Design (7th Edition). USA: Merrill Prentice Hall Publishers.

Medina, M. (2000). Scavenger cooperatives in Asia and Latin America. *Resources, Conservation & Recycling* 31: 51-69.

Medina, M. (2001). Scavenging in America: Back to the future? *Resources, Conservation and Recycling* 31: 229-40.

Metro Vancouver (2007). Zero waste challenge initiative. Retrieved on October 15, 2007 from http://www.gvrd.bc.ca/recycling-and-garbage/pdfs/2007MaterialBansNewspaperAd.pdf

Microsoft (2003). Microsoft® Office Excel® 2004 (Version 11.4.1.080219). [Computer Software] Microsoft Corporation.

Moreno-Sanchez, R.D.P and Maldonado, J.H. (2006). Surviving from garbage: the role of informal waste-pickers in a dynamic model of solid-waste management in developing countries. *Environment and Development Economics* 11: 371–391.

Nas, R. and Jaffe, P.J.M. (2004) Informal waste management: Shifting the focus from problem to potential. *Environment, Development and Sustainability* 6: 337-353.

Rendleman, N. and Feldstein, A. (1997) Occupational injuries among urban recyclers. *Journal of Occupational and Environmental Medicine* 39(7): 672-75.

Schefler, W. (1979). Statistics for the Biological Sciences (2nd edition). Don Mills, Ontario: Addison Wesley Publishing Company.

Sheel, J. (2007). Terms of Reference: Binning Assessment Project. Supervised by the Solid Waste Services – Engineering Department of the City of Vancouver.

Sheskin, I. (1985). Survey research for geographers. Washington, D.C.: Association of American Geographers.

Solid Waste By-law No. 8417 (2008). City of Vancouver British Columbia. Retrieved October 20, 2007 at http://www.city.vancouver.bc.ca/bylaws/8417c.pdf

Speer P.W. (2001). The relationship between social cohesion and empowerment: support and new implications for theory. *Health Education and Behavior* 28(6): 716-732.

The World Bank. (2007). Empowerment. Retrieved December 1, 2007 from http://web.worldbank.org/

Tremblay, C. (2007). Binners in Vancouver: A socio-economic study on binners and their traplines in Downtown Eastside. Master of Arts thesis accomplished at the University of Victoria.

Tremblay, C. (2007). Binning assessment in Vancouver: A city initiative in partnership with the United We Can bottle depot and other community partners. Prepared for the City of Vancouver.

Urban Binning Unit (2007). Retrieved on November 9, 2007 from http://www.urbanbinningunit.com/project.html

X. APPENDIX

A. SCRIPT USED TO RECRUIT PARTICIPANTS

BRITISH COLUMBIA
INSTITUTE OF TECHNOLOGY
A POLYTECHNIC INSTITUTION

3700 Willingdon Avenue
Burnaby, B.C.
Canada V5G 3H2

Script Used to Recruit Participants

Title of Research Project:
Health Assessment of Vancouver's binning community

Informing Potential Participants of Research

Potential participants will be approached in Vancouver and will be informed of the research project. An example of the dialogue is below.

"I am a student at the British Columbia Institute of Technology conducting a research project on binning activities in Vancouver. The research project will assess binner's in Vancouver, by looking at their health impacts."

Asking Potential Participants for Their Consent to Participate

Following a brief description of the research, I will ask the potential participant if he would like to participate in a questionnaire (10-15 min) concerning their participation in binning activity in Vancouver. An example of the dialogue is below.

"Would you be interested in participating in a (10-15 min) questionnaire? The questionnaire will include questions on your background, recycling habits and health risks. The information you provide is confidential and you are free to withdrawal at any point during the research".

Providing Participants with Explanatory Note of Research

If the individual wishes to proceed and answer the questionnaire, the consent form will first be explained and signed by the participant. If the participant wishes he will be provided with a copy of the consent form.

X. APPENDIX

B. CONSENT FORM

BRITISH COLUMBIA
INSTITUTE OF TECHNOLOGY
A POLYTECHNIC INSTITUTION

3700 Willingdon Avenue
Burnaby, B.C.
Canada V5G 3H2

RESEARCH CONSENT FORM

HEALTH ASSESSMENT OF VANCOUVER'S BINNING COMMUNITY

Principal Investigator: **Jade Yehia, BA** healthsurveybinners@gmail.com

Study Coordinator: **Helen Heacock, PhD**

Invitation
You have been invited to take part in this research study but before you proceed, please take the time to go over this form. This document states that you agree to participate in a research project performed by Jade Yehia of the Environmental Health Department at the British Columbia Institute of Technology. If you require more information or have any questions, please feel free to ask the researcher.

Purpose
Scavenging in garbage and recycling receptacles presents hazards to the health of individuals that perform this activity. It is the purpose of this study to interview binner's to evaluate their perceived health as well as comparing those recyclers with business partnerships to those without.

Nature of Proposed Research
The binning community in Vancouver, B.C. contends with a number of dangerous tasks while scavenging for material in the waste. Punctures from needle sticks, exposure to chemicals, cuts from broken glass, and contracting diseases, are among just a few of the risks that are regular health concerns facing these individuals. It is the nature of this research to look at the working conditions of binners in Vancouver and explore a possible solution to improve their health status.

This survey will be conducted between January and February 2008. A face-to-face questionnaire will be carried out concerning your recycling habits and health risks. The questionnaire will take between 10-15 minutes to complete and you will be asked to sign this consent form. All information collected in this research will be confidential and no names will ever be identified.

Benefits/Risks:
- There are no possible or likely risks involved in participating in this research.

- The benefit to participating in this research project is to increase your education and health awareness as well as providing information to the scientific community about the activity of urban recycling.

Confidentiality

- Only the principal researcher will have access to the research data.
- Research data will be kept in a locked cabinet at the researcher's residence.
- The researcher hopes to publish the researcher findings

Compensation:

- Your participation in this research is voluntary and compensation will be provided in the form of a coffee voucher.

Contact

- The researcher is available to answer any of your questions concerning the procedures and research questions. Please feel free to contact her at the e-mail address provided above. If you are interested, a summary of the final report will be available upon request.

Ethical Concerns

- You may verify the ethical approval of this study, or raise any concerns you may have, by contacting H.Heacock instructor at British Columbia Institute of Technology.

Consent

- You understand that you are free to withdraw your consent and discontinue your participation at anytime without negative consequences and the data will not be used in the research.
- You understand that your participation in this study is confidential
- You understand that the data from this study may be published.
- You understand that photographs taken could be used in this report.
- You understand the purpose of this study and know that there are no hidden motives.

Subject Signature _____ Date _____

Researchers Signature _____ Date _____

X. APPENDIX

C. SURVEY

Binning Assessment in Vancouver Survey 2008

Questions

Notes

Section A - Socio-demographical Information

1 Do you collect recyclable materials from outside of your home?

☐ Yes ☐ No

2 May I ask how old you are?

☐ Less than 18 ☐ No

☐ 18 - 55

☐ Older than 55

3 What's your ethnic background?

☐ Caucasian ☐ Canadian

☐ Other?_____

STOP HERE:
If the male individual is non-Caucasian, less than 18 or older than 55, and does not collect recyclables from the waste stream.

4 What is your housing situation?

☐ own ☐ rent

☐ shelter ☐ subsidized housing

☐ homeless ☐ Other? _____

5 Where do you live? (Neighbourhood) _____

6 What's your level of education?

☐ University ☐ College

☐ High school

☐ Primary school

7 What was your previous occupation? _____

8 Are you still employed?

☐ Yes ☐ No

9 Is street level recycling your main activity for income generation?

☐ Yes ☐ No

10 Do you collect social assistance?

☐ Yes ☐ No

11 If so, do you have health challenges that qualify you for a higher income assistance?

☐ Yes ☐ No

Section B - Resource Recovery

12 How many times/month do you collect recyclable materials?

- ☐ 1 - 10 days/mo
- ☐ 11 - 20 days/mo
- ☐ 21 - 30 days/mo
- ☐ when the need arises

13 How many hours/day do you collect recyclable materials?

- ☐ less than 2 hours
- ☐ 2-4 hours
- ☐ 4-6 hours
- ☐ 6-8 hours
- ☐ 8-10 hours
- ☐ Other? _____

14 How long have you been collecting recyclable materials?

- ☐ less than 6 months
- ☐ 6 months - 1 year
- ☐ 1-2 years
- ☐ 3 years
- ☐ 4 years
- ☐ > 4 years

15 What type of materials do you collect?

- ☐ Bottles
- ☐ Clothes
- ☐ Food
- ☐ Other? _____

16 Where do you recover materials?

- ☐ Dumpsters
- ☐ Litter cans
- ☐ Blue boxes
- ☐ Private partnerships
- ☐ *locked*
- ☐ *with racks*
- ☐ Secured buildings
- ☐ *unlocked*
- ☐ *without racks*

17 Do you have partnerships, such as an arrangement, with residences/businesses for bottle collection?

- ☐ Yes
- ☐ No

18 How can this activity be improved for you?

- ☐ Better equipment
- ☐ More partnerships
- ☐ Other? _____

Section C - Health Status

19 Do you collect food out of the waste?

- ☐ Yes
- ☐ Sometimes
- ☐ No

20 Where do you access clean water?

- ☐ Home
- ☐ Shelter
- ☐ Other? _____

21 Where do you access showers?

- [ ] Home
- [ ] Shelter
- [ ] Other? _____

22 Where do you access toilet facilities?

- [ ] Home
- [ ] Shelter
- [ ] Other? _____

23 What are your health risks related to collecting recyclable materials?

- [ ] Infection
- [ ] Cuts/punctures
- [ ] Physical soreness/bruises
- [ ] Other? _____

24 Have you ever had any injuries from collecting recyclables?

- [ ] Infection
- [ ] Cuts/punctures
- [ ] Physical soreness/bruises
- [ ] Other? _____

29 If so, have you ever seeked medical attention from these injuries or illnesses?

- [ ] Yes
- [ ] No

30 If you have, where do you go to receive medical attention?

- [ ] Family Doctor
- [ ] Drop-in Clinic
- [ ] Hospital
- [ ] Shelter/Community Nurse

31 Do you have any diseases that you wish to share?

- [ ] Yes, but I do not want to share them
- [ ] No
- [ ] HIV/AIDS
- [ ] TB
- [ ] Hepatitis B
- [ ] Hepatitis C
- [ ] Staph infection
- [ ] Cancer (Type: _____)
- [ ] Mental Illness
- [ ] Other? _____

32 Do you wear protective clothing when collecting recyclable materials?

- [ ] Yes
- [ ] No

33 How would you rate your overall health on a scale of 1 - 6 (1 = poor and 6 = excellent)?

- [ ] 1 to 2 (poor)
- [ ] 3 to 4 (moderate)
- [ ] 5 to 6 (good)

X. APPENDIX

D. RESULTS OF SURVEY

		TOTAL With Part.	TOTAL W/O Part.	% With Part.	% W/O Part.
Housing Situation?	own	1	0	5	0
	shelter	0	1	0	3
	homeless	8	13	40	43
	SRO	5	11	25	37
	rent	6	4	30	13
	sub. housing	0	1	0	3
Level of education?	University	4	4	20	13
	College	2	3	10	10
	High School	14	22	70	73
	Primary School	0	1	0	3
Employed?	Yes	1	7	5	23
	No	19	23	95	77
Binning as main source of income?	Yes	16	24	80	80
	No	4	6	20	20
Collect social assistance?	Yes	7	25	35	83
	No	13	5	65	17
Collect disability?	Yes	4	10	20	33
	No	16	20	80	67
Collect recycables / month?	1 to 10	3	4	15	13
	11 to 20	1	4	5	13
	21 to 30	16	21	80	70
	When the need arises	0	1	0	3
Hours of Binning / day?	< 2 hours	1	0	5	0
	2 to 4	4	6	20	20
	4 to 6	5	13	25	43
	6 to 8	2	2	10	7

	8 to 10	3	6	15	20
	> 10 hours	5	3	25	10
How long have they been a binner?	< 6 months	2	2	10	7
	6 m to 1 yr	0	3	0	10
	1 to 2 yr	4	8	20	27
	3 years	3	4	15	13
	4 years	4	1	20	3
	> 4 years	7	12	35	40
Type of materials collected?	Bottles	8	7	40	23
	Plus Clothes	0	8	0	27
	Plus Food	12	15	60	50
Where they collect materials from?	Locked Dumpster	7	3	35	10
	Unlocked Dumpster	6	19	30	63
	Garbage Cans with racks	0	3	0	10
	Garbage Cans w/out racks	0	1	0	3
	Only Blue boxes	3	4	15	13
	Secured Buildings	4	0	20	0
Collect food out of the waste?	Yes	11	14	55	47
	Sometimes	2	7	10	23
	No	7	9	35	30
Access clean water?	Home	12	11	60	37
	Shelter	0	2	0	7
	Other	8	17	40	57
Access showers?	Home	11	11	55	37
	Shelter	0	2	0	7
	Other	9	17	45	57
Access toilets?	Home	12	11	60	37
	Shelter	0	2	0	7

	Other	8	17	40	57
Injuries from binning?	Infection	9	9	45	30
	Cuts/punctures	5	13	25	43
	Physical soreness / bruises	0	3	0	10
	None	6	5	30	17
Where do they seek medical attentio	Family Doctor	4	5	20	17
	Drop-in Clinic	3	5	15	17
	Community Nurse	0	2	0	7
	Hospital	9	8	45	27
	They don't	4	10	20	33
Diseases?	None	11	17	55	57
	HIV / AIDS	2	2	10	7
	TB	0	0	0	0
	Hepatitis B and/or C	4	8	20	27
	Staph Infection	2	1	10	3
	Diabetes / Asthma	1	2	5	7
Protective Clothing?	Yes	14	17	70	57
	No	6	13	30	43
Rate their health?	1 to 2	1	1	5	3
	3 to 4	10	19	50	63
	5 to 6	9	10	45	33

⇒ contrasting values between groups

⇒ comparable percentages between groups

X. APPENDIX

E. CHI SQUARE STATISTICAL ANALYSIS RESULTS

Cross Tabulation Report

Page/Date/Time 1 5/8/2008 10:17:42 AM
Database

Counts Section

Partnership_y_n	perceived_health 0	1	Total
0	20	10	30
1	11	9	20
Total	31	19	50

The number of rows with at least one missing value is 0

Expected Counts Assuming Independence Section

Partnership_y_n	perceived_health 0	1	Total
0	18.6	11.4	30.0
1	12.4	7.6	20.0
Total	31.0	19.0	50.0

The number of rows with at least one missing value is 0

Chi-Square Contribution Section

Partnership_y_n	perceived_health 0	1	Total
0	0.11	0.17	0.28
1	0.16	0.26	0.42
Total	0.27	0.43	0.70

The number of rows with at least one missing value is 0

Chi-Square Statistics Section

Chi-Square	0.693265	
Degrees of Freedom	1	
Probability Level	0.405056	Accept Ho
Phi	0.117751	
Cramer's V	0.117751	
Pearson's Contingency Coefficient	0.116943	
Tschuprow's T	0.117751	
Lambda A .. Rows dependent	0.000000	
Lambda B .. Columns dependent	0.000000	
Symmetric Lambda	0.000000	
Kendall's tau-B	0.057143	
Kendall's tau-B (with correction for ties)	0.117751	
Kendall's tau-C	0.112000	
Gamma	0.241379	
Kappa reliability test	0.117647	
Kappa's standard error	0.141296	
Kappa's t value	0.832626	
McNemar's Test Statistic	0.047619	
McNemar's Degrees of Freedom	1	
McNemar's Probability Level	0.827259	

Fisher's Exact Test Section

	P1	**P2**
Proportions	0.645161	0.526316
Difference (D0 = P1-P2)	0.118846	
Correlation Coefficient	0.117751	

Hypothesis	**Prob Level**	**Test Type**	**Calculation Method**
Ho: P1=P2			D=P1-P2 for a table
Ha: P1<P2	0.870590	One-Tailed	Sum of prob's of tables where D<=D0
Ha: P1>P2	0.295376	One-Tailed	Sum of prob's of tables where D>=D0
Ha: P1<>P2	0.553168	Two-Tailed	Sum of prob's of tables where |D|>=|D0|

Counts Section

business	social_assistance 0	1	Total
0	13	7	20
1	5	25	30
Total	18	32	50

The number of rows with at least one missing value is 0

Row Percentages Section

business	social_assistance 0	1	Total
0	65.0	35.0	100.0
1	16.7	83.3	100.0
Total	36.0	64.0	100.0

The number of rows with at least one missing value is 0

Column Percentages Section

business	social_assistance 0	1	Total
0	72.2	21.9	40.0
1	27.8	78.1	60.0
Total	100.0	100.0	100.0

The number of rows with at least one missing value is 0

Table Percentages Section

business	social_assistance 0	1	Total
0	26.0	14.0	40.0
1	10.0	50.0	60.0
Total	36.0	64.0	100.0

The number of rows with at least one missing value is 0

Cross Tabulation Report

Page/Date/Time 4 4/21/2008 1:55:17 PM
Database

Chi-Square Statistics Section

Chi-Square	12.167245	
Degrees of Freedom	1	
Probability Level	0.000486	Reject Ho
Phi	0.493300	
Cramer's V	0.493300	
Pearson's Contingency Coefficient	0.442400	
Tschuprow's T	0.493300	
Lambda A .. Rows dependent	0.400000	
Lambda B .. Columns dependent	0.333333	
Symmetric Lambda	0.368421	
Kendall's tau-B	0.236735	
Kendall's tau-B (with correction for ties)	0.493300	
Kendall's tau-C	0.464000	
Gamma	0.805556	
Kappa reliability test	0.491525	
Kappa's standard error	0.140913	
Kappa's t value	3.488158	
McNemar's Test Statistic	0.333333	
McNemar's Degrees of Freedom	1	
McNemar's Probability Level	0.563703	

Fisher's Exact Test Section

	P1	**P2**
Proportions	0.722222	0.218750
Difference (D0 = P1-P2)	0.503472	
Correlation Coefficient	0.493300	

Hypothesis	**Prob Level**	**Test Type**	**Calculation Method**
Ho: P1=P2			D=P1-P2 for a table
Ha: P1<P2	0.999938	One-Tailed	Sum of prob's of tables where D<=D0
Ha: P1>P2	0.000674	One-Tailed	Sum of prob's of tables where D>=D0
Ha: P1<>P2	0.000812	Two-Tailed	Sum of prob's of tables where |D|>=|D0|

Counts Section

partnership	hrs_binning_day 0	1	Total
0	12	8	20
1	21	9	30
Total	33	17	50

The number of rows with at least one missing value is 0

Row Percentages Section

partnership	hrs_binning_day 0	1	Total
0	60.0	40.0	100.0
1	70.0	30.0	100.0
Total	66.0	34.0	100.0

The number of rows with at least one missing value is 0

Column Percentages Section

partnership	hrs_binning_day 0	1	Total
0	36.4	47.1	40.0
1	63.6	52.9	60.0
Total	100.0	100.0	100.0

The number of rows with at least one missing value is 0

Table Percentages Section

partnership	hrs_binning_day 0	1	Total
0	24.0	16.0	40.0
1	42.0	18.0	60.0
Total	66.0	34.0	100.0

The number of rows with at least one missing value is 0

Chi-Square Statistics Section

Chi-Square	0.534759
Degrees of Freedom	1
Probability Level	0.464613
Phi	0.103418
Cramer's V	0.103418
Pearson's Contingency Coefficient	0.102869
Tschuprow's T	0.103418
Lambda A .. Rows dependent	0.000000
Lambda B .. Columns dependent	0.000000
Symmetric Lambda	0.000000
Kendall's tau-B	-0.048980
Kendall's tau-B (with correction for ties)	-0.103418
Kendall's tau-C	-0.096000
Gamma	-0.217391
Kappa reliability test	-0.090226
Kappa's standard error	0.123382
Kappa's t value	-0.731272
McNemar's Test Statistic	5.827586
McNemar's Degrees of Freedom	1
McNemar's Probability Level	0.015777

Accept Ho

Fisher's Exact Test Section

	P1	P2
Proportions	0.363636	0.470588
Difference (D0 = P1-P2)	-0.106952	
Correlation Coefficient	-0.103418	

Hypothesis	Prob Level	Test Type	Calculation Method
Ho: P1=P2			D=P1-P2 for a table
Ha: P1<P2	0.333228	One-Tailed	Sum of prob's of tables where D<=D0
Ha: P1>P2	0.849792	One-Tailed	Sum of prob's of tables where D>=D0
Ha: P1<>P2	0.548464	Two-Tailed	Sum of prob's of tables where |D|>=|D0|

Counts Section

partnership \ clean_water	0	1	2	Total
0	12	0	8	20
1	11	2	17	30
Total	23	2	25	50

The number of rows with at least one missing value is 0

Row Percentages Section

partnership \ clean_water	0	1	2	Total
0	60.0	0.0	40.0	100.0
1	36.7	6.7	56.7	100.0
Total	46.0	4.0	50.0	100.0

The number of rows with at least one missing value is 0

Column Percentages Section

partnership \ clean_water	0	1	2	Total
0	52.2	0.0	32.0	40.0
1	47.8	100.0	68.0	60.0
Total	100.0	100.0	100.0	100.0

The number of rows with at least one missing value is 0

Table Percentages Section

partnership \ clean_water	0	1	2	Total
0	24.0	0.0	16.0	40.0
1	22.0	4.0	34.0	60.0
Total	46.0	4.0	50.0	100.0

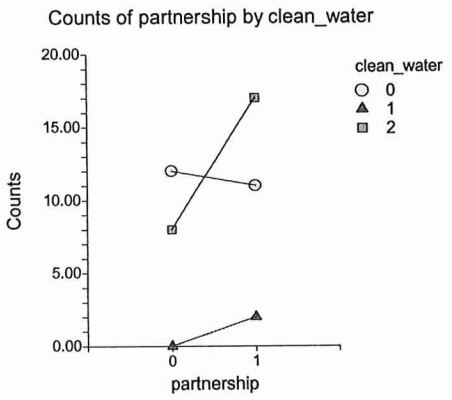
The number of rows with at least one missing value is 0

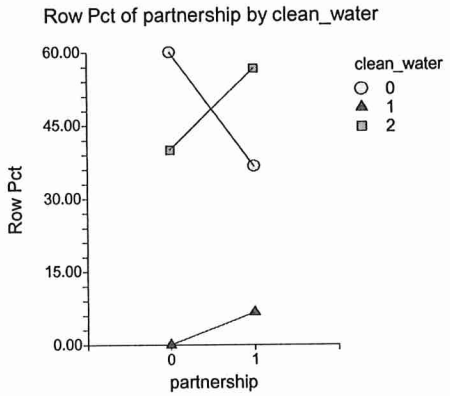
Chi-Square Statistics Section

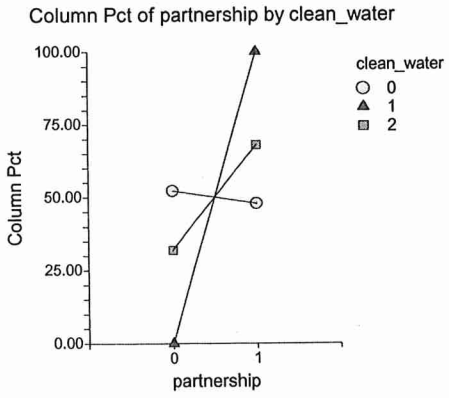
Chi-Square	3.420290	
Degrees of Freedom	2	
Probability Level	0.180840	Accept Ho
Phi	0.261545	
Cramer's V	0.261545	
Pearson's Contingency Coefficient	0.253034	
Tschuprow's T	0.219932	
Lambda A .. Rows dependent	0.050000	
Lambda B .. Columns dependent	0.160000	
Symmetric Lambda	0.111111	
Kendall's tau-B	0.101224	
Kendall's tau-B (with correction for ties)	0.195427	
Kendall's tau-C	0.148800	
Gamma	0.373494	

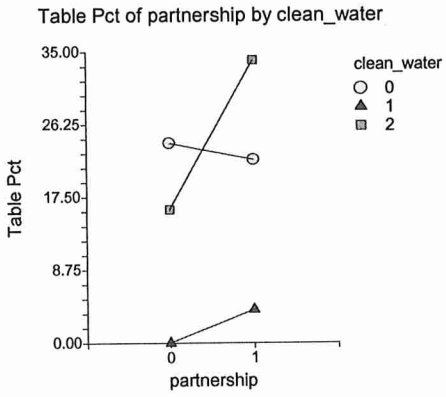
WARNING: At least one cell had an expected value less than 5.

Plots Section









Counts Section

partnerships \ education	0	1	Total
0	14	6	20
1	23	7	30
Total	37	13	50

The number of rows with at least one missing value is 0

Row Percentages Section

partnerships \ education	0	1	Total
0	70.0	30.0	100.0
1	76.7	23.3	100.0
Total	74.0	26.0	100.0

The number of rows with at least one missing value is 0

Column Percentages Section

partnerships \ education	0	1	Total
0	37.8	46.2	40.0
1	62.2	53.8	60.0
Total	100.0	100.0	100.0

The number of rows with at least one missing value is 0

Table Percentages Section

partnerships \ education	0	1	Total
0	28.0	12.0	40.0
1	46.0	14.0	60.0
Total	74.0	26.0	100.0

The number of rows with at least one missing value is 0

Cross Tabulation Report

Page/Date/Time 4 4/21/2008 2:04:11 PM
Database

Chi-Square Statistics Section

Chi-Square	0.277200	
Degrees of Freedom	1	
Probability Level	0.598542	Accept Ho
Phi	0.074458	
Cramer's V	0.074458	
Pearson's Contingency Coefficient	0.074253	
Tschuprow's T	0.074458	
Lambda A .. Rows dependent	0.000000	
Lambda B .. Columns dependent	0.000000	
Symmetric Lambda	0.000000	
Kendall's tau-B	-0.032653	
Kendall's tau-B (with correction for ties)	-0.074458	
Kendall's tau-C	-0.064000	
Gamma	-0.169492	
Kappa reliability test	-0.058394	
Kappa's standard error	0.110910	
Kappa's t value	-0.526498	
McNemar's Test Statistic	9.965517	
McNemar's Degrees of Freedom	1	
McNemar's Probability Level	0.001595	

Fisher's Exact Test Section

	P1	P2
Proportions	0.378378	0.461538
Difference (D0 = P1-P2)	-0.083160	
Correlation Coefficient	-0.074458	

Hypothesis	Prob Level	Test Type	Calculation Method
Ho: P1=P2			D=P1-P2 for a table
Ha: P1<P2	0.417963	One-Tailed	Sum of prob's of tables where D<=D0
Ha: P1>P2	0.804400	One-Tailed	Sum of prob's of tables where D>=D0
Ha: P1<>P2	0.744283	Two-Tailed	Sum of prob's of tables where |D|>=|D0|