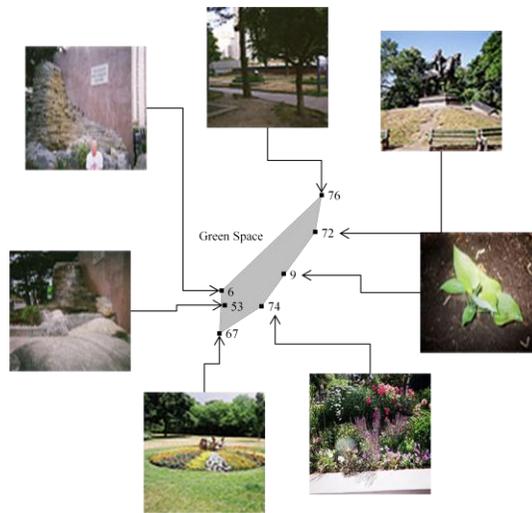


ST. JAMES TOWN INITIATIVE
Neighbourhood and Health

**Integration of Concept Mapping and Photovoice: Understanding Immigrant
Perceptions of Neighbourhood Influences on Health**



By

Nasim Haque, MD, DrPH¹
Scott Rosas, PhD²

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¹ Director, Community Health & SJT Initiative, Wellesley Institute

² Consultant from Concept Systems Inc.

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EXECUTIVE SUMMARY

Social scientists are increasingly exploring ways to converge different analytical approaches for better understanding and effectively using qualitative data for planning and decision making. To date, community-based researchers have used a range of participatory research methodologies such as photovoice and concept mapping to explore the relationships between neighbourhood characteristics (physical, social, environmental, and economic) and health and wellbeing. However, the use of multiple participatory methodologies to fully involve disadvantaged populations in the process of collecting, organizing, consolidating and interpreting data in meaningful ways has received much less attention.

This study is unique and the first of its kind to consider the use of photographs as the input material for concept mapping. The two participatory research techniques converged here are: (a) photovoice, a qualitative method where *individuals* provide insight into how they conceptualize their circumstances through photographic images and stories; and (b) concept mapping, a mixed-methods participatory technique where *a group* systematically organizes and represents ideas solicited by its members. This study establishes that these two techniques can be effectively used to engage disadvantaged participants in multiple ways throughout the process of project development, data collection, data analysis, and organizing the data (visual cues) into useful information for program planning and policy advocacy. The effective merging of these two participatory methods sought to maintain the visual nature of the photovoice project and enabled the creation of a visual display of how the participants and the group as a whole conceptualized neighbourhood factors that they perceived to implicate their health and well being. Additionally, the integrated approach was used to expand the sample size of the project in order to simultaneously confirm the initial findings of the photovoice project and build consensus around advocacy and action.

The results of this study highlighted the complementary nature of CBPR approaches, photovoice and concept mapping. The sequential integration of the results from the photovoice project with concept mapping extended the findings by systematically and rigorously building a consensus framework of health impacting factors in the St. James Town neighbourhood.

1. INTRODUCTION

A healthy community environment encompasses aspects of human health, disease, and injury that are determined or influenced by factors in the broad physical, economic and social environments. Growing evidence suggests that characteristics of the neighborhood in which one lives confer both risk and resilience for poor health outcomes over and above individual factors. A broad range of health outcomes has been considered in neighborhood research including indices of adult physical health¹⁻⁹ and mental health¹⁰⁻¹⁶ as well as child well-being¹⁷⁻³². However, in order to translate findings from such research into effective programs, better understanding of the mechanisms by which neighborhood conditions contribute to health are required.

In order to understand and improve the health and wellbeing of Canadian urban areas, there is a call for a greater emphasis in research and policy development on social determinants of health (SDOH) as well as community-based participatory research that incorporates people's lived experiences at the neighbourhood level³³⁻³⁵. Where people live can influence their health behaviours, the risks they are exposed to, and the opportunities available to them. The social, economic, cultural and environmental factors associated with urban areas can for example influence the choices individuals have regarding the food they eat, the recreational activities they participate in, their housing and their access to social support and economic resources^{36, 37}. The past decade has uncovered growing evidence of the impact neighbourhood level factors have on residents' health and wellbeing even when compositional factors such as an individual's socio-economic status are accounted for^{36, 38-44}.

Concurrent with the identification of neighbourhood factors impacting health and well-being, is the proliferation of community based participatory research (CBPR) models that have enabled a better understanding of the contexts in which these factors manifest. CBPR is modeled on the core principles of partnership, collaboration and information sharing whereby the research process brings individuals with a shared interest or common purpose together. The CBPR approach facilitates the engagement of community partners, who have firsthand knowledge and experience of the challenges and issues being explored, to build consensus and actions that represent the community involved. The ultimate goals of CBPR, through the process of bringing people with diverse skills and knowledge together, is to develop meaningful, responsive research to advocate for policies and interventions that effectively address the issues that were identified through the process. With the inclusion of community in the research process, the depth and relevance of findings are potentially greater as the outcomes represent the true needs and perceptions of the people who will ultimately be affected by the research process as well as the outcomes⁴⁵.

CBPR recognizes that "knowledge is power" and that transformative information comes in many different forms and from many valuable sources, not just 'expert' researchers and practitioners⁴⁵. CBPR is a valuable approach to research and community development because, on the one hand, it helps the researchers to learn from the lived experiences of the community and on the other hand, it can be a powerful capacity building process for the community involved through

opportunities for training, sharing, relationship building, and decision making. The approach encourages the community to identify issues that they want to address which in turn may generate interest and allocate greater resources among residents to initiate actions for bringing positive social changes in the community.

2. FOCUS OF THE STUDY

An extensive literature exists where community-based researchers have used a range of participatory research methodologies such as photovoice and concept mapping to explore the relationships between neighbourhood characteristics (physical, social, environmental, and economic) and health and wellbeing. However, the use of multiple participatory methodologies to fully involve disadvantaged populations in the process of collecting, organizing, consolidating and interpreting data in meaningful ways has received much less attention.

This study is unique and seeks to contribute to the existing literature on CBPR. The study establishes that two participatory research techniques: (a) photovoice, a qualitative method where *an individual* provides insight into how they conceptualize their circumstances through photographic images and stories; and (b) concept mapping, a mixed-methods participatory technique where *a group* systematically organizes and represents ideas solicited by its members, can be effectively used to engage participants in multiple ways throughout the process of project development, data collection, data analysis, and data organization (of visual cues) into useful information for program planning and policy advocacy. The effective merging of these two participatory methods sought to maintain the visual nature of the photovoice project and enabled the creation of a visual display of how the participants and the group as a whole conceptualized neighbourhood factors that they perceived to implicate their health and well being. Additionally, the integrated approach was used to expand the sample size of the project in order to simultaneously confirm the initial findings of the photovoice project and build consensus around advocacy and action.

3. STUDY CONTEXT

North St. James Town (SJT) is a central Toronto neighbourhood located in the northeast corner of Toronto's downtown core. About 14,666 people (resident estimates are higher at 25-30,000 people) occupy the community's 0.23 km² of land, almost all of whom live in 18 aging high-rise rental apartment buildings. Today, with 64,636 people/km², SJT is one of the most densely populated areas in Canada, and has a very diverse population. About 64% of SJT residents are immigrants; 26% of these arrived in Canada within the last five years, and the majority are visible minorities⁴⁶. SJT is home to many ethno-racial communities with over 50 languages spoken by a substantial proportion of the population⁴⁷. About 25% of residents in St. James Town have a university degree which is the same as the Toronto city average whereas the average household income in SJT is only \$32,539, almost half of that reported for Toronto (\$69,194)⁴⁸.

St. James Town provides an excellent context for this study because of the diversity of the neighbourhood as well as the challenges and opportunities present within this small geographic area. SJT is a convenient place for immigrants' establishing themselves in a new country, as it is

within walking distance of schools, community services, stores, and public transit. It is in close proximity to some of the city's wealthiest neighbourhoods, and the downtown core. These positive amenities make it similar to immigrant receiving neighbourhoods in other Canadian city cores. The neighbourhood also faces a number of challenges such as aging infrastructure, limited open space and potential safety concerns. Understanding the intersection between immigrant health and neighbourhood influences in SJT will shed light on neighbourhood influences on immigrants' health in other Canadian receiving neighbourhoods, and on the ways on which immigrants are successfully utilizing their neighbourhoods to promote their health and well being.

The concept mapping was carried out as a component of the larger five year initiative, the St. James Town Initiative, of the Wellesley Institute. The larger initiative is focused on the identification of social determinants of health (social, physical, and economic conditions) and examined whether these factors have a differential effect on the health and wellbeing of immigrants of different ethno-racial backgrounds residing in the neighbourhood. By design, the initiative was an inclusive process that engaged a disadvantaged population (immigrants) and working with them to explore the health issues they experience through their perceptions. Through the use of photovoice, underrepresented, marginalized residents were able to record and reflect their personal and community's strengths and concerns through photographs and storytelling. The participants were given four weeks to take photos of neighbourhood attributes that they perceived to be important for their health and wellbeing. Health was defined using the World Health Organization's definition of health. The photovoice report is available at www.sjtinitiative.com

4. METHODS

4.1. Methods Overview

Photovoice and concept mapping were sequenced to maximize the benefits related to participation, interpretation, and utilization. Photovoice was used as the primary mechanism for identification of key neighbourhood factors that influence immigrant residents' health and well-being. These factors were captured in photographic images and stories as part of an elicitation approach that specifically called for critical reflection by focusing attention on both the positive and negative aspects within the neighborhood. Concept mapping was used as a mechanism to create a forum for discussion, build consensus, organize the factors and move forward the photovoice work of the immigrant residents. The methodology was primarily chosen to build on the participatory nature of the project and to transform the visual cues into an interconnected framework which still represents the ideas that were captured in photographs while also portraying the relationships between all of the ideas. Additionally, the process enabled other neighborhood residents to engage in further discussions about the perceived importance of those factors and the potential for action to be taken to support or address the identified factors.

4.2. Photovoice

Photovoice is an arts-based CBPR process that engages people to identify, represent and convey specific issues present in their community through pictures⁴⁹. This technique uses qualitative and investigative methodology. Participants are trained to use cameras and storytelling to voice their experiences and concerns. Increasingly, arts-based research methods are being used in the health sector to explore and provide insights into health issues and service delivery because these approaches are adaptive, subjective and can be used to understand the effectiveness and perceptions of health and health care issues from the perspectives of clients^{50, 51}.

Photovoice is a powerful and inclusive methodology because it places control of the research in the hands of study participants from the onset. It enables underrepresented, marginalized people to record and reflect their personal and their community's strengths and concerns through photographs which generate dialogue, and share knowledge about important issues⁵². It has been used to engage and empower marginalized and disadvantaged individuals and communities who are frequently left out of decision making processes and have often been the subject of research without the benefit of having access to the information or even knowing the outcomes of the studies. This has led to understandable resistance to formal research and interventions in marginalized communities where people feel that they are the subject of research rather than active participants. Photovoice minimizes these barriers and engages vulnerable and marginalized individuals and communities in sharing their ideas, perceptions and life experiences, thus "shift[ing] control over representation and knowledge generation from those in positions of power to those whose perspectives are seldom seen or heard." (Israel et al., 2005, p. 328). Notable examples include the use of photovoice to understand chronic pain in older adults⁵³, and to understand the perceptions of health and healthy behaviour of adolescent parents⁵⁴.

The photovoice methodology not only gives marginalized people a voice, it creates an opportunity to raise collective awareness of issues and challenges that they have experienced. It is an approach that benefits research as it can be used to increase knowledge about people's perceptions and behaviours while creating a foundation for social change at the community level⁵⁵. By building the capacity of participants and by valuing their knowledge and experiences, photovoice can be used to advocate for change by promoting a critical dialogue that brings together planners and policymakers through actions such as community forums, exhibits and dialogues. This can ultimately promote and influence changes that will impact the people who have been involved in the process⁵⁰. The process is a credible and effective way for marginalized individuals and groups to "become advocates in their own lives and communities"⁵⁶.

4.3. Concept Mapping

The concept mapping methodology is an innovative structured conceptualization technique that provides a conceptual framework for how a group views a particular topic or construct of interest (Kane & Trochim, 2007; Trochim, 1989a). As a mixed-methods approach, concept mapping integrates familiar qualitative group processes with multivariate statistical analyses to help a group articulate and delineate concepts and their interrelationships. The concept mapping process

typically requires participants to brainstorm a large set of statements relevant to the topic of interest, individually sort these statements into piles according to the perceived similarity and rate each statement on some scale, and interpret the maps that result from the data analyses.

The analyses typically include a two-dimensional multidimensional scaling (MDS) of the unstructured sort data, a hierarchical cluster analysis (HCA) of the MDS output, and the computation of average ratings for each statement and cluster of statements. The resulting maps show the individual statements in two-dimensional (x,y) space with more similar statements located nearer each other, identifying how the statements are grouped into clusters that partition the space on the map. In addition, participants are led through a structured interpretation session designed to help them understand the maps and label them in a substantively meaningful way. The entire process is driven by the stakeholders themselves, ranging from initial brainstorming, to the eventual identification and naming of clusters of thought, to interpretation and application of the maps⁵⁷.

Concept mapping has been used with a number of topics associated neighborhood health and well being of neighborhood residents within a number of different disciplines. It has been used to address substantive issues in child welfare⁵⁸⁻⁶⁰, youth development^{61, 62}, mental health and substance abuse⁶³⁻⁶⁶, and health care⁶⁷⁻⁷⁰. More recently, concept mapping has been promoted as a useful participatory research method for public health researchers interested in generating hypotheses, further expanding theory, and establishing priorities for action⁷¹⁻⁷⁴. For example, concept mapping has been instrumental in exploring women's perceptions of the relationship between residential neighborhood factors and intimate partner violence^{71, 75}, conceptualizing and measuring specific barriers to racial/ethnic minority participation in medical research⁷⁶ and identifying contributors to health inequities and uncovering contextual factors previously unknown to public health planners⁷⁷. In each of these studies, community participants were actively engaged in defining and structuring the topic of interest.

4.4.Participant Recruitment

Immigrant residents who had participated in the photovoice project were invited to participate in the concept mapping workshops. At this stage other immigrant residents from the neighbourhood were also invited to participate in the project. The sampling was purposive and several methods were used to recruit new participants: (1) word of mouth; (2) through partner community organizations; (3) through the Initiative's extensive community contact email listserve. The inclusion criteria for participating in the project were: (1) age: older than 18yrs, (2) immigrant: arrived in Canada in the last ten years, (3) lived in North St. James Town for 6 months or more, (4) have some comprehension of the English language, and (5) have time to attend two workshops. Food was served and a small compensation was offered to each participant.

Three workshops were organized and for the convenience of participants these workshops were conducted on the weekends. Each workshop lasted between 2.5 to 3 hours. The first workshop was attended by the photovoice participants (n=17). The second workshop was attended by new participants who were immigrant residents from the same neighbourhood (n=24). The third workshop was organized to bring all participants together to review the results, agree on the final number of "clusters" or items representing conceptual domains, and agree on the labels assigned

to each “cluster”. This meeting also helped to yield a consensus group map which represented what they believed as a collective was the correct representation of their viewpoints.

4.5.Data Collection and Material

The data collection for the concept mapping process for this study was slightly different than those usually used in concept mapping. While concept mapping typically uses written statements as input for sorting and rating activities, the processes and analytic methods are not limited to the exclusive use of written ideas. If designed and structured appropriately, visual stimuli will conceivably work as well. For the second phase of the study, photographs from the photovoice project, taken by immigrant residents as descriptors of their neighbourhood that they perceived to have implications on their health and wellbeing were used. These photographs served as the foundation for the sorting and rating procedures. As a product of a previously conducted photovoice project, 77 photographs with a one to two sentence caption providing a context for the photograph was used as input and language was used as the “symbolic anchors” for those structuring the material. Photos offer a different set of cues or anchors for organizing. However, the inclusion of the captions with the photographs helped sorters to understand the context and viewpoint of the photographer. Because of the variety in these visual cues, it is possible that there may be great diversity in the structures from one sorter to the other.

4.6.Sorting and Rating Sessions

Two separate sorting and rating sessions were held with 41 neighborhood immigrant residents as participants. Sixteen participants attended the first session and 25 attended the second. Although there are no strict rules for the number of sorting and rating participants Trochim (1989a) has recommended a minimum between 10-15 participants. The sessions were designed to engage participants in the articulation of interrelationships among the concepts by having individual participants sort and rate each of the 77 photographs. Each of the project participants was given a numbered set of 77 photographs with a brief caption orienting the participant to the context of the photographic image⁷⁸⁻⁸⁰. The participants worked individually to sort the photographs into piles according to their similarity, that is, they were asked to decide which photographs, in their opinion, belonged together. Four major expectations guided the sorting process: (1) all photographs could not be put into a single pile, (2) all photographs could not be put into their own separate piles (although some photographs could be grouped by themselves), (3) photographs could not be placed in two piles simultaneously, and (4) there could not be any “miscellaneous” piles (any item thought to be unique was to be put in its own separate pile). After sorting the statements, each participant recorded the contents of each pile by listing the statement identifying numbers and creating a short descriptive label for each pile.

For the rating activity, project participants were asked to carefully consider each of the 77 photographs and rate each on two dimensions. First, all 41 participants rated each statement on a 5-point Likert-type response scale in terms of how important the image was to them and their family’s health and wellbeing, where 1=relatively unimportant (compared with the rest of the statements); 2=somewhat important; 3=moderately important; 4=very important, and, 5=extremely important. Because participants were unlikely to consider images of their neighborhoods that were totally unimportant with respect to health and well being, it was

stressed that the rating should be considered a relative judgment of the importance of each item to all the other items. The second rating was again set in a 5-point Likert-type response scale and focused on the potential for action to support or address the issue, where 1= no potential for action, 2=some potential for action, 3=moderate potential for action, 4=high potential for action compared to the rest, and 5=action already occurring. As with the importance rating, participants were asked to assess the potential for action to be taken relative to the other images in the set.

5. ANALYSES

A review of the sorted data submitted by the 41 participants revealed it to be complete, and all sorted data were included in the analysis. Nonmetric multi-dimensional scaling (MDS) was conducted using the sorted data to produce the concept map. Using the Concept System[®], MDS created a map of points that represented the set of photographs, based on the similarity matrix that resulted from the sorting procedure. MDS is based on the measurement model that assumes that the relative similarity of objects can be represented in terms of the relative distance between pairs of points⁸¹. Nonmetric multidimensional scaling is a multivariate analysis technique that takes any similarity (e.g., proximity) matrix and represents it in any number of dimensions as distances between the original photographs in the matrix. It takes a table of similarities (or distances) and iteratively places points on a map so that the original table is as fairly represented as possible. The output from the two-dimensional multidimensional scaling is a set of X-Y values that can be plotted in the form of a “point map”, as well as some diagnostic statistical information. A two dimensional map was chosen for its ease and interpretability⁸². In studies where solutions other than two-dimensional solutions have been examined, the two-dimensional solution has been found to be acceptable, especially when coupled with cluster analysis⁸³.

The sorted data from each of the 41 participants were entered into a matrix with 77 rows and 77 columns, corresponding to the 77 photographs. A value of 1 was assigned to a cell for those photographs sorted together in a pile (e.g., if photographs 2 and 26 were sorted into the same pile by Participant A, in Participant A’s matrix, 1 would be entered in the cell in which column 2 and row 26 intersected). A value of 0 was assigned to a cell for those photographs that had not been sorted together. Because an item was considered sorted with itself, the diagonal values of the matrix were equal to 1. The result was a binary symmetric similarity matrix for each of the 41 individuals. The individual sorted matrices were added together to produce a group similarity matrix. This matrix contained the same 77 rows and columns; however, instead of ones and zeros in the cells, the group similarity matrix included the number of participants who sorted the photographs together in a pile. Hence, values between 0 and 41 were possible. A value of 41 indicated that all participants saw the photographs in question as belonging together. Likewise, a value of 0 indicated that none of the participants saw the photographs as belonging together. Finally, the MDS analysis transformed the group similarity matrix into a rank-ordered table of distances between photographs. This table of similarities (or distances) was used to iteratively place points on a map so that the original table was as fairly represented as possible. The output consisted of a set of plotted X-Y values that formed a “point map,” with each numbered point representing a photographic image from the photovoice project.

Hierarchical cluster analysis (HCA) was the second analysis conducted using the Concept System software. This analysis was used to group photographs, as represented by points on the

map, into clusters that presumably reflected similar concepts. The approach used by The Concept System used the two-dimensional X-Y coordinate data obtained from the MDS analysis as input for the hierarchical cluster analysis and applied Ward's algorithm as the basis for defining the clusters⁸⁴. Using the MDS configuration as input to the cluster analysis in effect forces the cluster analysis to partition the MDS configuration into non-overlapping clusters in two-dimensional space. This technique grouped or separated the photographs on the map, such that photographs placed in the same cluster were in contiguous areas of the map. The end product was a "cluster map," which revealed how the photographs, as represented by points, were grouped. There are no specific, definitive criteria by which the final number of clusters can be selected. The procedure used in this example was to begin with a 15-cluster solution and successively increase and decrease the solutions by 1. The higher and lower solutions were examined and a decision made for each configuration as to whether the separation or merger of clusters appeared to adequately represent the data as stated, organized, and prioritized by participants. From a review of the different configurations, a 10-cluster solution was determined to be the best in preserving the most detail while offering the most substantive interpretation. There is no simple mathematical criterion by which a final number of clusters can be selected.

The rating data were averaged across the 41 participants for each item and cluster. The average ratings were overlaid on the point map to produce two types of importance rating output. A "point rating map" consisted of the original point map with the average rating per item displayed as vertical columns next to each point. A "cluster rating map" consisted of the cluster average ratings displayed as layers of each cluster.

6. INTERPRETIVE SESSION

Six participants volunteered to review the proposed cluster labels as well as offering any preliminary interpretative comments after the initial two workshops. Subsequently, the subgroup of 41 participants was reconvened in the third workshop to review and interpret the output produced by The Concept System. The results were represented by a large wall map with the photographs in clustered groupings for participants to visualize their work, review and comment. A guided tour of the map was provided, describing how the analysis constructed the map as well as the meaning of the proximal location of the points representing the photographs. Following the review of the map, a group discussion was held; with participants working cluster by cluster to recommend acceptable labels that captured the content of each cluster. Agreement of the labels among the participants was sought, and in those rare situations in which consensus among participants were not immediately reached, a possible label was suggested. Participants were invited to discuss their interpretations and suggest how the map might be used in the future.

7. RESULTS

A total of 41 neighborhood residents participated in the modified concept mapping process, held over two separate sessions. The age of participants who sorted and rated the photographs ranged from 18 to 75 years with a mean of 39.4 (SD = 14.2) years. Length of time in the community ranged from 1 year to 27 years, with a mean of 5.2 years (SD = 5.4 years). Nearly three quarters (n = 30; 73.2%) were female. Nearly all of the participants indicated they were born outside of

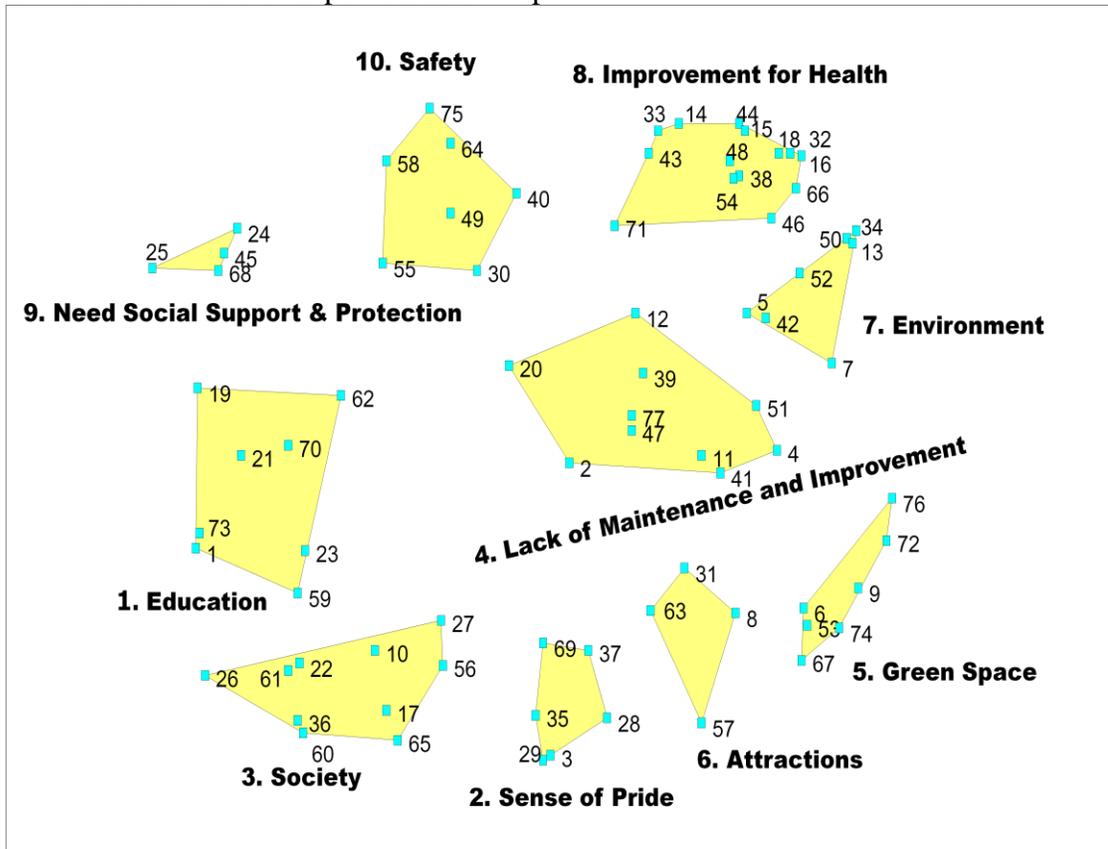
Canada (97.6%). More than half of the participants had completed a university program in their home country. Seventy percent indicated they were employed in either a fulltime job, one part-time job, or multiple part-time jobs. Participants reported a broad range of ethnic backgrounds, including Chinese, Filipino, Nepalese, Indian, Sri-Lankan, Tamil, Bangladeshi, and Somali.

7.1. Concept map

The MDS analysis of the similarity matrix converged after ten iterations, producing a final stress value of 0.27. The stress value is reported as part of the MDS analyses to indicate the goodness of fit of the two-dimensional configuration to the original similarity matrix. A lower stress value indicates a better fit and reflects a stronger relationship between the optimal and actual configurations⁸¹. In a study of the reliability of concept mapping, Trochim (1993) reported that the average stress value across 33 projects was 0.285 with a range from 0.155 to 0.352. Thus, the stress value found on this project was consistent with those found across numerous typical concept mapping projects.

The result of the two-dimensional solution of the MDS analysis was a sophisticated map of concepts representing several domains. The two-dimensional configuration of the 77 photographs represented by their numerical indicators is graphed in Figure 1. The distances among the points and clusters are fixed in MDS. However, the directionality of the map is subjective; the same map can be rotated in any direction without changing its interpretation. For example, there is no substantive meaning to the fact that the *Improvement for Health* cluster is at the top of the map and the *Sense of Pride* cluster is at the bottom. Location on the map is a function of perceived similarity. That is, the photographs that were most frequently sorted together are closer to one another than those that were seldom or never sorted together. Clusters of photographs are indicated by the shaded polygons in Figure 1. As with photographs, clusters that are closer together are considered to be more similar.

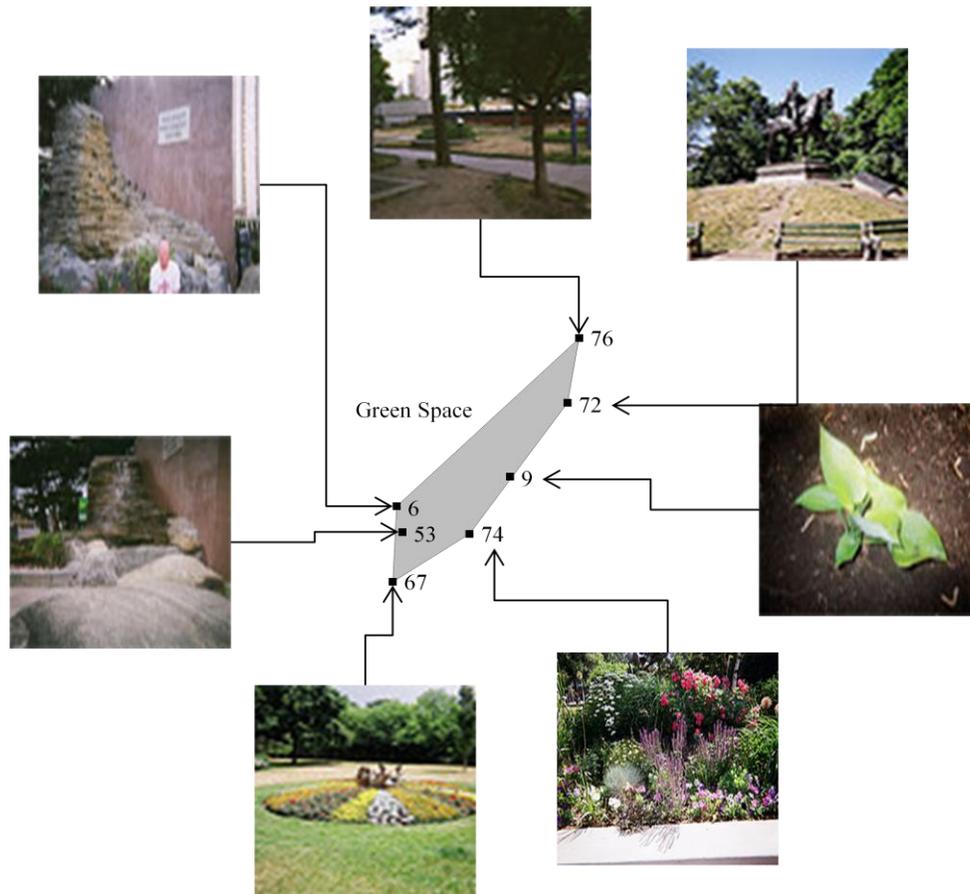
Figure 1. Final two-dimensional point-cluster map



Across the map, each photograph is marked by a point with the item identifying number located next to it. Figure 2 below shows one cluster, Green Spaces, as a representative example with its clustered photographs linked to their respective location on the map.

The captions on each photograph (not shown) are excerpts from each of the photo stories reflecting a neighbourhood attribute pointed out by the photographer. These captions were finalized with consensus of the newcomer residents working group. For example the caption for photo number 6 states: *This is a soothing sight for tired eyes, an effective distraction from the barren concrete jungle around. Many passers-by stop to admire the scenery and it is a welcome sign to visitors to the apartments. The government should get involved in beautification projects like this, as they provide a sense of pride in our community.* Similarly, caption on photo number 74 reads: *Every morning, I take a walk in Allen Gardens and enjoy the quiet and fresh air. Even in the winter, I can enjoy the greenhouses. There are not good green spaces in St. James Town. Seniors and kids cannot go far to find a good park. We need more green space in our community.* The concept of green spaces is clearly evident and appeared to be widely agreed upon by participants by virtue of the photographs sorted together and occupying the proximal location on the map. During the sorting session participants kept the captions into consideration while grouping similar ideas together.

Figure 2. Cluster: “Green Spaces” illustrating photos linked to their specific points

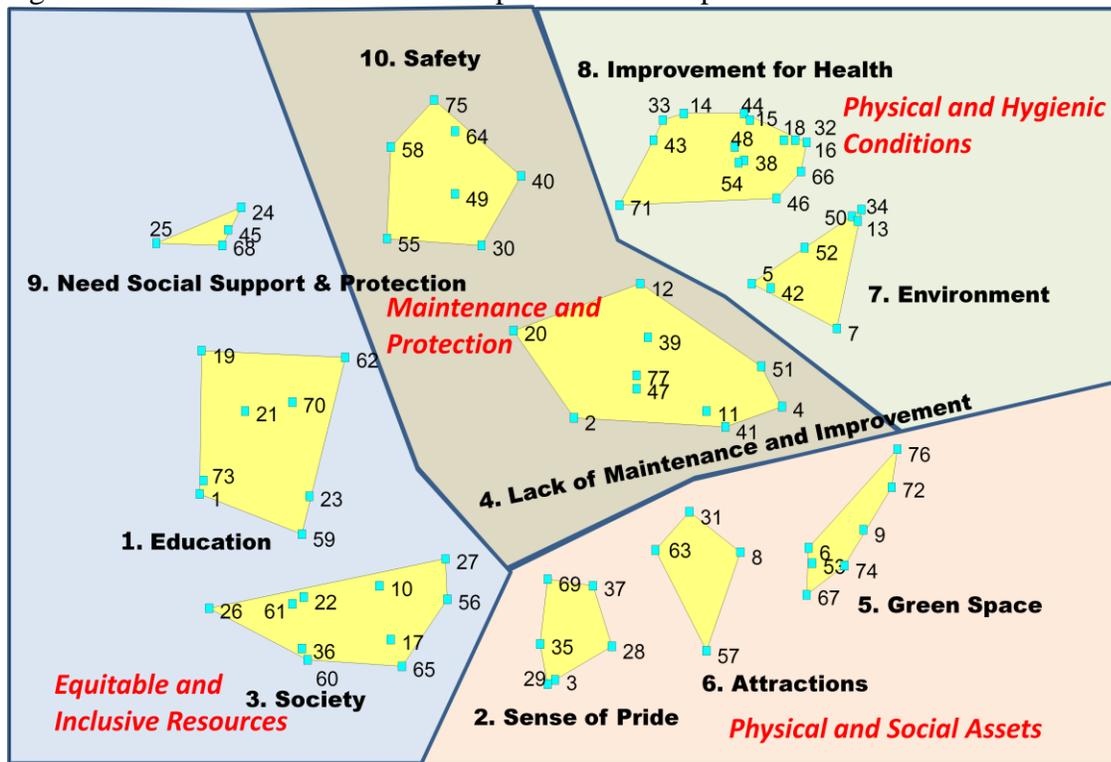


The current concept map software is designed to use written statements as input material. However, the complete map showing all ten clusters illustrating photographs linked to their respective points on each cluster is available on the SJT website www.sjtinitiative.com. One can click on a point and it will pull up a specific photograph in the context of the other points and clusters on the map.

For the purpose of action planning, the clusters represented in Figure 1 were further partitioned as illustrated in Figure 3 into four distinct groups of clusters or impact areas: (1) physical and hygienic conditions; (2) physical and social assets; (3) equitable and inclusive resources; and (4) maintenance and protection. The top part of the map (groups 1 and 4) contains the clusters: improvement for health, environment, safety, and lack of maintenance and improvement. These clusters contain photos with captions reflecting those neighbourhood characteristics that participants perceived to have negative implications on their health and wellbeing. Similarly, the lower portion of the map (groups 3 and 4) contains the clusters: green spaces, attractions, sense of pride, society, education, and need social support and protection, which contains photos and statements referring to those neighbourhood characteristics which are perceived to have positive impact on immigrant residents' health and wellbeing.

The partitioning (Figure 3) of the clusters can be used as a tool for program planning and policy information. The three impact areas; (a) Physical and Hygienic Conditions, (b) Lack of Maintenance and Improvement, and (c) Physical and Social Assets indicate that the actions needed to address the concerns are at the local level, i.e. at neighbourhood and/or city level. However cluster, Social Support and Protection (9) within the impact area, Equitable and Inclusive Resources indicate that the identified concerns need higher level interventions i.e. at provincial and national level. The interactive point cluster map with each point linked to its respective photograph and caption can be seen at http://sjtinitiative.com/concept_map/concept_map.htm.

Figure 3. Partitioned two-dimensional point cluster map

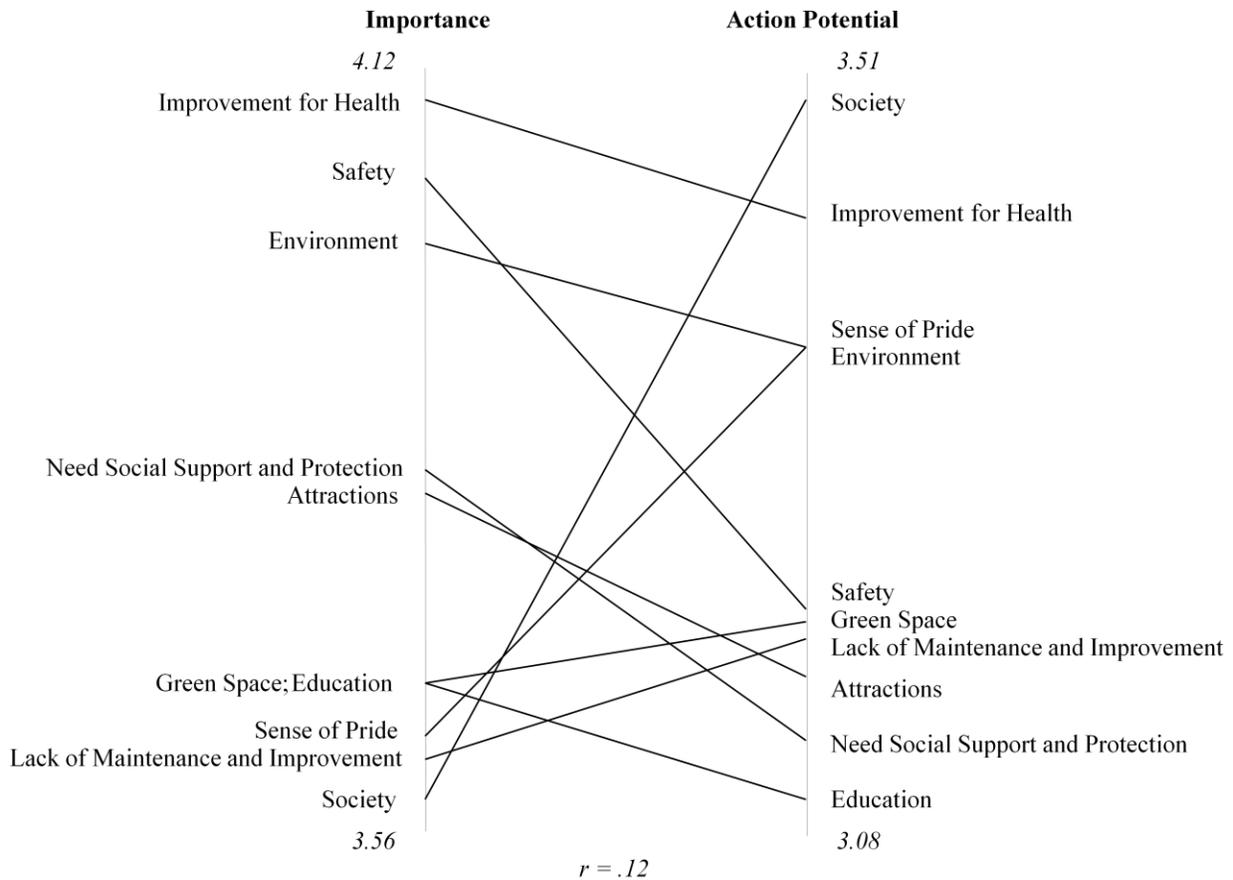


7.2.Importance –Action Potential Pattern match

Figure 4 summarizes the average ratings for each cluster and illustrates the level of agreement between its importance and its action potential as was perceived by the participants. The correlation between the ratings of importance and action potential is low, as evidenced by the relatively low r coefficient ($r = 0.12$). This finding is not surprising and reflects a cogent understanding on the part of the participants of the challenges associated with instituting changes within neighbourhoods to impact health and well-being. Collectively, this group of residents clearly understood the notion that simply because an idea or collection of ideas are viewed as important to the health and well-being of residents, does not mean there is a corresponding level of potential action. The cluster *Society* was ranked highest in terms of action potential but was ranked the lowest in terms of importance as shown on the pattern match graph. This finding suggested that although residents saw this cluster as the relatively least important in terms of its

impact on health and well-being, participants also viewed this set of items as having the greatest potential for action and change. Alternatively, residents rated the cluster *Improvement for Health* as the relative most important set of health impacting items, yet they also saw this cluster as having the next to highest potential for action. Because of the high value placed on this cluster by residents and the high degree of agreement for action potential, future steps toward action planning to address these issues is more likely to be widely accepted and buy-in secured by a greater number of individuals.

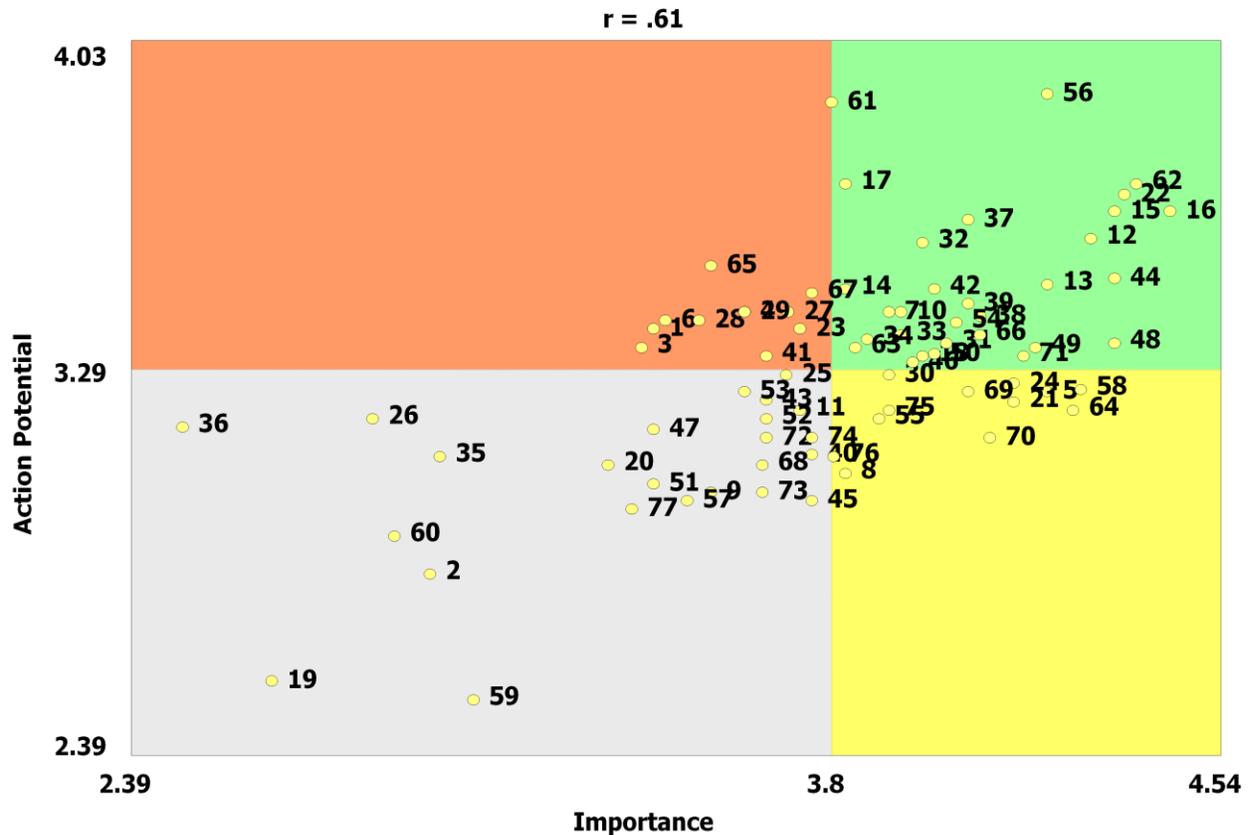
Figure 4. Pattern Match: Average Ratings of Clusters in terms of Importance and Action Potential



*Absolute values for ratings range from 1.0-5.0

Finally, each of the items was contrasted by the two ratings to reveal which items were rated above average in terms of relative importance and potential for action. The results was a smaller set of items, highly valued and perceived as actionable, that cut across clusters and enabled the group to narrow and focus their planning efforts. Figure 5 reveals a “go-zone” a bivariate scatter plot produced in the Concept System software that shows levels of agreement among the rating scales at the cluster level. The Go-Zone analysis was used to help the group identify areas that may warrant concentrated attention, provide strategic possibilities to address gaps, and consider the relative value of the ratings together on each specific idea.

Figure 5. Bivariate scatter plot of all items by importance and action potential ratings



8. DISCUSSION

This study is unique and illustrates how two participatory research techniques; photovoice and concept mapping can be effectively combined together to keep participants engaged throughout the process of project development, data collection, data analysis, data organization (using visual cues) into useful information for program planning and policy advocacy.

The photovoice technique was effectively used here to engage and generate interest among residents of a research resistant community. On one hand, the participants from the beginning of this project felt that they were in control of the project which in turn helped them to take ownership of the project. On the other hand, the process allowed researchers to keep participants specific on the topic that helped them to gather information on those neighbourhood factors that they perceived to affect their health and wellbeing in either positive or negative ways. In the second phase of the project, concept mapping was used for four reasons: (1) to maintain the participatory and visual nature of the project, (2) to determine if visual cues could be used instead of ideas generated through other means, (3) if at this stage other new neighbourhood

participants could be included in the study without compromising the study, and (4) initiate interest for action.

Ultimately, we were successful in engaging a diverse group of residents, some of whom had participated in the photovoice project and some whom were new to the research process, in the development of a sophisticated multivariate framework of factors that influence the health and well-being of residents. Moreover, the elements within this unique framework are represented by photographs, taken by residents and depicting actual conditions within the community, rather than abstract statements.

The value of integration of these methods is evident in three areas. First, from a participation standpoint, the use of photographs as input for the concept mapping process enabled full participation of neighborhood residents from very diverse cultural and linguistic backgrounds. The photographs served to communicate the variety of factors that impact neighborhood residents' health and well-being and provided a mechanism for reaching a common understanding of the presence of such factors. The visual images fostered a strong commitment to and completion of the concept mapping process, unencumbered by the challenges inherent in seeking consensus from a linguistically and culturally diverse group. We were able to identify and gauge understanding of complex ideas that impact neighborhood health on the part of the participants, despite the diversity in language.

Second, from an interpretive standpoint, the concept mapping results displayed a sophisticated multivariate framework of health impacting factors in the St. James Town neighborhood. This complex taxonomy is enhanced by the linkage to visual images that facilitate easy identification of the issue highlighted by residents. While interpretation within photovoice is not limited to each individual photograph, the concept mapping process systematically produced a framework where interrelationships between items were specified. Thus, the qualitative judgments made by participants as to how these factors, from their view are connected, were quantitatively specified and structured. While photovoice enabled residents to articulate an interpretive perspective of each photograph, the structuring of photographs in a framework of interrelated components enabled a higher level of interpretation and discussion. Rather than interpretation and meaning-making occurring at the level of each individual item, groups of items based on their relative similarity were considered in the context of other groups of factors. Movement away from a categorical view of objects or ideas towards one which views objects as differing in degree on multiple dimensions. As Judd and Kenny (1981) posit this emphasis on gradient of similarity is needed in building more specific pattern expectations⁸⁵.

Finally, from a use perspective, concept mapping facilitated greater utilization of the data originally collected via photovoice. Residents were able to clearly and accurately identify areas where value and potential for action intersected; yielding a consensus perspective that maximizes buy-in and support, thereby increasing the likelihood of success. Within these regions, policies and practices that promote neighborhood health and well being can be more readily recognized, relative to other areas of action.

9. Limitations of the study

Several limitations of this work are worth noting. This study is a snapshot of north St. James Town and characteristics of the neighbourhood may change over time. The data collected as part of this study is very context specific, and as such generalizability may be limited. While the processes and procedures described in this paper are replicable, the results are likely to differ across contexts and populations. Convenience sampling was used to generate ideas and for sorting and rating sessions, and it is possible that immigrants who opted to participate in this study differed from those who did not participate. However, the sample obtained appears to be representative of the racial/ethnic mosaic of the neighbourhood.

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