# A first-time investigation of psychosocial inclusivity in design: inclusive supermarket design for older individuals

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**Abstract:** As a first-time investigation of 'psychosocial inclusivity' in design, this paper introduces and establishes the concept of psychosocially inclusive design, and explores it within the context of supermarket shopping for older individuals, as one instrumental activity of daily living. Inclusive design theory and practice have been predominantly concerned with issues of physical access, limiting its scope and relevance to the wider more complex psychosocial issues. Employing research triangulation and rigorous empirical investigations, this paper advances the fundamental understanding, extends the general research agenda, and pushes the current boundaries of inclusive design towards non-physical inclusion by identifying any possible psychosocial constructs. Four constructs including 'cognitive', 'emotional', 'social', and 'value' were identified in the context of supermarket shopping through ethnographic interviews; creative workshop; and observations conducted with a total of 58 older individuals. The results may play a crucial role in establishing the theoretical foundations to the concept of psychosocial inclusivity in design.

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## 1 Introduction

An ageing population with substantial disposable income and more active roles in society, coupled with an increasingly vocal community of people with disabilities, are leading to the increasing visibility of social isolation, inequality, and need for inclusivity beyond physical access (Hedvall, 2013; Nickpour et al., 2012; Gaver and Martin, 2000; Demirkan, 2007; Imrie and Hall, 2003; Demirbilek and Demirkan, 1998).

Inclusive design is one approach for addressing these issues and for moving towards greater diversity and equality (Da Silva et al., 2013; McCarron et al., 2013; Suzman and Beard, 2011; Stephanidis and Emiliani, 1999). As a design philosophy, inclusive design aims to provide better life opportunities for as many people as possible through the design of accessible products, environments and services (Coleman et al., 2007).

Whilst generally recognised as good practice, it can be argued that the application of inclusive design as a positive, responsible and holistic approach has been rather limited (Persson et al., 2015). It is now often argued that further exploration, evaluation and development is needed in order to achieve genuine and holistic inclusivity within our increasingly diverse and complex societies (Frye, 2013; Hedvall, 2013; Nickpour et al., 2012; Gaver and Martin, 2000; Demirkan, 2007; Imrie and Hall, 2003; Demirbilek and Demirkan, 1998). Furthermore, in the wider world of design, intangible aspects in areas such as *meaning centred design* (Giacomin, 2017; Verganti, 2013); *design for subjective wellbeing* (Jordan et al., 2017); *human centred design* (Giacomin, 2014; Brown, 2009); *experience design* (Hassenzahl et al., 2010; Pullman and Gross, 2004; Hekkert et al., 2003); *emotional design* (Norman, 2005); and *pleasurable design* (Jordan, 2002) have been well explored. However, the existing theory and practice of inclusive design still predominantly focus on accessibility and physical aspects of experience, thus there appears to be an opportunity for integrating further research which addresses the psychological and social aspects of inclusion. In this paper, these non-physical aspects of inclusivity involving psychological and social aspects are referred to as 'psychosocial inclusivity'. Lim (2018) suggests a definition of psychosocial inclusivity as "the provision of equal or equitable opportunities in design for a better quality of life for as many people as possible, considering both psychological and social factors" based on theoretically informed research. This paper adopts this as a working definition.

The notion of 'psychosocial' is usually described as a multidisciplinary and context-dependent concept. The term 'psychosocial' has been defined as "the close relation between psychological factors (emotion, behaviour, cognition) and the socio-cultural context" (Psychosocial Working Group, 2003). It has been used to enhance the individuals' quality of life and well-being (Andersen et al., 2014; Thirsk et al., 2014; Ruggeri et al., 2013; Vernooij-Dassen et al., 2010; Rodgers et al., 2005; Ruddy and House, 2005; Psychosocial Working Group, 2003; Cooke et al., 2001) since the 1950s, mainly in medical and psychiatry journals, and its usage has increased since the 1990s (Roseneil, 2014).

As the first step to explore the concept of psychosocial inclusivity in design, older individuals' supermarket shopping activity was selected as an ethnographic context in this study.

Older individuals are one of the key beneficiaries of inclusive design along with individuals with disabilities (Hedvall, 2013; Nickpour et al., 2012; Gaver and Martin, 2000; Demirkan, 2007; Imrie and Hall, 2003; Demirbilek and Demirkan, 1998). The United Nations (United Nations, Department of Economic and Social Affairs, Population

Division, 2017) refers to the older population aged 60 and over which were adopted to refer to the target group i.e. 'older individuals', alongside similar terms such as 'older person/people', 'elderly people', 'senior citizens' and 'older adults'.

Inclusive design is applied in various contexts such as the design of transport systems, services and facilities, education, products and goods, premises and built environment (Casserley and Ormerod, 2003). Within these contexts, practical implications for psychosocially inclusive design are often evaluated through instrumental activities of daily living (IADL). These are essential activities for independent living by humans (Spector et al., 1987), especially older individuals (Katz, 1983; Lawton and Brody, 1970). IADL include housework, preparing meals, taking medication, managing money, shopping for groceries or clothing, use of the telephone or other forms of communication, and transportation within the community.

Amongst those activities, shopping is one activity which is strongly influenced by both physical and non-physical aspects – an individuals' physical and health conditions, geographic availability (Ishikawa et al., 2013; Yakushiji and Takahashi, 2014; Aggarwal et al., 2014; Pettigrew et al., 2005; Chow et al., 2014; Rose and Richards, 2004; Aylott and Mitchell, 1998) and socioeconomic status (Ishikawa et al., 2017; Pechey and Monsivais, 2016; Ministry of Agriculture et al., 2014). Shopping is also frequently associated with other daily activities such as personal transportation, money management and preparing meals (Spector et al., 1987).

In addition, supermarket shopping for older individuals is considered to be one important contributor to independent lifestyle and choice of diet (Lang and Hooker, 2013; Thompson et al., 2011). Physical aspects of store environment such as queues at checkouts, parking access, accessibility of products on the shelves, and the availability of food products in appropriate sizes (Moschis et al., 2004; Hare, 2003; Hare et al., 2001; Goodwin and McElwee, 1999; Dychtwald, 1997; Moschis, 1992) have been discussed as critical issues that impact older individuals' supermarket shopping experience. While issues of physical inclusivity are evident, combinations of psychological, social, and health factors such as mental illness, social isolation (Davies and Knutson, 1991), entertainment (Tongren, 1988), the attitude of staff, and social interaction (Leventhal, 1997; Moschis et al., 2004) also affect the supermarket shopping experience of older individuals.

It has been suggested that shopping activity affects not only physical well-being, but also the psychological and social well-being of older individuals (Amarantos et al., 2001). These aspects of well-being are linked to quality of life, which is defined as "a multi-faceted concept comprised of subjective evaluations of material, physical, emotional and social well-being" (Felce and Perry, 1995). Since supermarket shopping involves a rich mixture of both physical and psychosocial considerations, it was selected as the ethnographic context for the current study.

The remaining sections of the study consisted of exploratory investigations performed in order to identify possible constructs or factors which contribute to the psychosocial inclusivity construct. Two research questions were established to achieve study purpose:

- Do psychosocial aspects affect older individuals' supermarket shopping experience?

- What are the possible psychosocial constructs that need to be considered for better inclusivity in individuals' supermarket shopping?

## 2 Methodology

### 2.1 Choosing methods for the study

This research conducted three empirical investigations which are the human centred design tools (Giacomin, 2014) including 'ethnographic interviews (semi-structured)' (Spradley, 2016), 'creative workshop' (Steen et al., 2011), and 'fly-on-the-wall observation' (Robson and McCartan, 2016). It can be expected that use of more than one method for collecting data (data triangulation) provides multiple perspectives and greater validity to enhance the degree of confidence and rigour in the results (Robson and McCartan, 2016; Denzin, 2017; Jick, 1979).

The ethnographic interviews were conducted in order to identify existing psychosocial constructs in older individuals' supermarket shopping based on their previous shopping experiences. From this, an initial list of psychosocial constructs was created.

The creative workshop was conducted in order to identify any undiscovered psychosocial constructs in the ethnographic interviews. The initial list of psychosocial constructs was updated in this stage.

Non-participant observation was conducted to identify any possible psychosocial constructs of the participants' real-world supermarket shopping experience which usually cannot be detected by verbal interactions such as interview and workshop discussions and in order to develop the findings of the two former methods. For this, the findings of the former two methods were used to create a checklist which helps researchers to not miss any existing psychosocial aspects identified in the former methods. Also, the former findings were used as an initial structure in the observational data analysis stage. A diagram of the complete research methodology applied is shown in Figure 1.

**Figure 1**     The research methodology
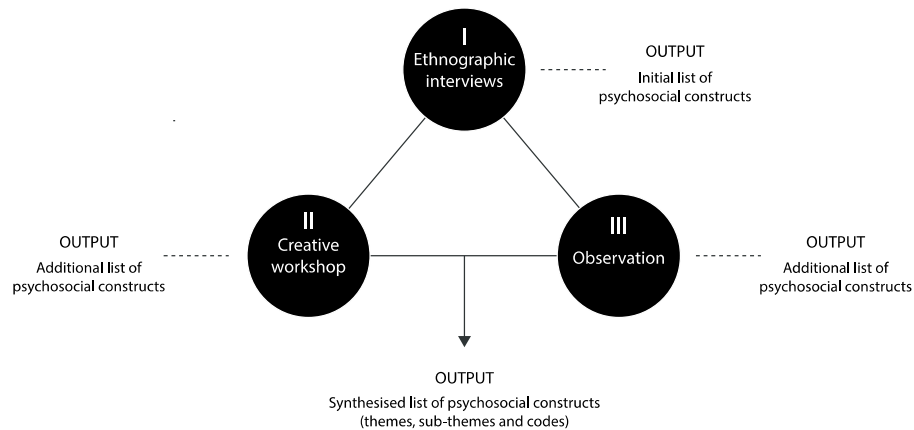


### 2.2 Sampling

Supermarket shopping reflects personal preferences and also links to the individuals' socio-economic conditions (Ishikawa et al., 2017). Table 1 presents the best-known

supermarket brands in the UK regarding the marketing distinction of high, middle, or low-cost supermarkets (Pechey and Monsivais, 2015). Their market penetration and number of stores are also provided for reference (USDA Foreign Agricultural Service, 2016).

**Table 1**      The best-known UK supermarkets categorised by target customers

| Category by cost | Supermarket | Market share (2016) | Number of stores (2016) |
|---|---|---|---|
| High-cost | Waitrose | 5.4% | 350 |
| | M&S | 4.3% | 914 |
| Medium-cost | Tesco | 28.2% | 3,493 |
| | Sainsbury's | 16.0% | 1,312 |
| | Asda | 15.6% | 626 |
| | Morrisons | 10.4% | 569 |
| | The Co-operative | 6.5% | 4,000 |
| Low-cost | Aldi | 6.2% | 620 |
| | Lidl | 4.6% | 630 |
| | Iceland | 2.1% | 864 |

In 2015, for example, over 99.7% of the UK households (n = 24,828/24,879) used medium-cost supermarkets such as Tesco, Sainsbury's, and Asda for their major shopping (Pechey and Monsivais, 2015). Further, these medium-cost supermarkets have more than double market share (76.70%) and number of stores (8,720) compared to those of other two categories.

Therefore, older individuals who shop at least once in a fortnight in medium-cost supermarkets were selected for the three investigations. A total of 58 participants were selected.

Table 2 provides the details and numbers of the participants involved in each investigation. A research ethics approval was granted by the research Ethics Committee of Brunel University and the University of Southampton. Prior to each investigation, information sheet, ethical and consent forms were provided.

**Table 2**      The three selected investigations and their variables

| Investigation | Total number of participants | Gender (M/F) |
|---|---|---|
| Background interviews | 31 | 10/21 |
| Creative workshop | 19 | 5/14 |
| Non-participant observations | 8 | 3/5 |

## 3    Data collection and analysis

### 3.1   Ethnographic interviews

#### 3.1.1  Ethnographic interview protocol

As the first investigation, ethnographic interviews were conducted with 31 old individuals in order to understand the old individuals' general daily lives including

lifestyle, routines, health, well-being and shopping behaviour. The aim of this investigation was to identify the existing psychosocial constructs so as to provide a basis for the later investigations (creative workshop and observations).

The interviews were designed as semi-structured and consisted of three sections: warm-up questions (general background and supermarket shopping style), lifestyle and habits (diet and behaviours), health and well-being (health and psychosocial aspects). The complete set of questions is available in the Appendix A.

Each interview conversation was audio recorded using a voice recorder and each interview lasted no more than 30 minutes. Each recorded interview conversation was transcribed to text by professional transcription team later.

### 3.1.2 Ethnographic interview data analysis

The interviews transcripts created from the above were analysed by two coders, including one final year PhD researcher in design and one design researcher with over 15 years of experience. The 'six phases of thematic analysis' (Braun and Clarke, 2006): familiarisation with the data; generating initial codes; searching for themes; reviewing themes; defining and naming themes; producing the report, was adopted for coding analysis process.

As the first step (familiarisation stage), five of the 31 transcripts were selected and analysed to create an initial structure. For this, the 'process coding' and 'domain and taxonomic coding' (Saldaña, 2015) were used to code and group the participants' comments based on their meaning and implications. The coded and grouped data were categorised, named, and collated into potential themes (patterns). In this initial stage, as many codes as possible were identified so as to avoid losing any possible psychosocial constructs for the later stage of data analysis.

NVivo software, which provides multiple combinational matrices of the data (Edhlund and McDougall, 2012), was used to analyse the rest of the interview data. The initial structure from the above stage was imported into the NVivo. The newly identified codes from the rest of interview data were named and categorised as new themes or under the existing themes of the initial structure according to their implications or meaning. The process adopted for the review of the final structure followed the recommendations (Braun and Clarke, 2006) of the '15 point checklist of criteria for good thematic analysis'

### 3.1.3 Findings from the ethnographic interview

The codes were combined and grouped under four main categories based on the meaning and implications of themes and codes: 'general background' (individual's socio-demographic characteristics, physical condition, etc.); 'shopping' (supermarket-related factors including store items, facilities and environments, surrounding facilities, etc.); 'psychosocial constructs' (any non-physical factors); and 'others' (accessibility, usability, efficiency, etc.). The results can be presented as a matrix chart in order to identify how each code in 'psychosocial constructs' category link to the particular codes in other categories, i.e., general background, shopping, and others using NVivo software. However, considering this paper is an initial step to identify psychosocial constructs in older individuals' supermarket shopping, the correlations between codes in psychosocial aspects and other categories will be studied in the future

research. Therefore, Table 3 presents solely the 'psychosocial constructs' category for convenience.

Three themes and 29 codes under the 'Psychosocial constructs' category. In this stage, the findings are still broad and general considering the interview questions covered not only older people' supermarket shopping but also their general life style. The themes are organised in alphabetic order and the codes are paganised based on number of occurrences. A complete set of the data analysis results including other categories i.e. General background, Shopping, and Others from the interviews is available in Appendix B.

**Table 3**      An initial list of psychosocial aspects identified from the ethnographic interviews

| *Category* | *Theme* | *Codes* | |
|---|---|---|---|
| Psychosocial constructs | Cognitive theme | Preference (25) | Reliability (9) |
| | | Health (19) | Independence (4) |
| | | Convenience (17) | Confidence (3) |
| | | Self-conscious (15) | Confusion (3) |
| | | Self-awareness (10) | Patriotism (1) |
| | Emotional theme | Satisfaction (with supermarket products and services) (22) | Sense of belonging (11) |
| | | Self-esteem (22) | Frustration (7) |
| | | Enjoyability (15) | Anxiety (4) |
| | | Happiness (14) | Tiresomeness (2) |
| | | | Safety (1) |
| | Social theme | Social relationship (17) | Public attitude (3) |
| | | Social activity (16) | Public awareness (3) |
| | | Social participation (10) | Support from others (3) |
| | | Public transportation (4) | Social service (2) |
| | | Generational difference (3) | Cultural difference (1) |

Note: Provenance of the numbers in the brackets: number of occurrences.

### 3.2   Creative workshop

### 3.2.1   Creative workshop protocol

A creative workshop was conducted with 19 older individuals (five males and 14 females), who predominantly use medium-cost supermarkets, and 17 design students as assistants. The design students supported the workshop by means of leading the discussion, note-taking and recording. A co-design approach was used for workshop protocol which is recognised as a useful human-centred approach by various businesses and organisations (Binder et al., 2008). Steen et al. (2011) stress that the co-design approach allows participants including potential users, researchers, developers, and designers to creatively participate in an activity. The workshop was conducted for three hours.

Twenty minutes introduction session was conducted to provide basic information of the workshop. The participants were broken into five groups, which were facilitated by three to four design students, in order to conduct three discussion sessions. Each

discussion conducted for 30 minutes, and the participants in each group were regrouped after individual session.

The main purpose of the sessions was to evoke participants' thoughts and emotions from their lived-experiences of supermarket shopping in order to identify any psychosocial issues appearing during participants' shopping. The assistants (design students) noted all issues which were identified.

After each discussion session, the participants shared identified issues and insights by creating post-it notes. Theses post-it notes were categorised into three themes including 'like' (positive aspects of the participants' shopping experience)', 'dislike' (negative aspects of the participants' shopping experience), and 'to be improved' (aspects be improved in the participants' shopping experience). These three categories were used to focus attention in this investigation. Figure 2 illustrates the actual creative workshop.

**Figure 2** Illustration of the creative workshop (see online version for colours)



### 3.2.2 Creative workshop data analysis

The identified insights from the above were initially analysed and clustered by five coders, (three final year design PhD researchers and two design researchers with over 15 years of experience). The thematic coding and process were adopted (Braun and Clarke, 2006; Saldaña, 2015) to analyse and categorise the participants' comments. The coded comments were then newly named, subdivided or merged into probable themes or sub-themes based on their meanings or implications. The identified themes and sub-themes were repeatedly reviewed by the five coders until full agreement was achieved.

### 3.2.3 Updated list of psychosocial constructs

Table 4 presents solely the updated list of 'Psychosocial constructs' category based on the ethnographic interviews and the creative workshop for convenience. The themes and sub-themes are organised in alphabetic order and the codes are paganised based on number of occurrences. A complete set of the updated list including other categories (general background, shopping, and others) is available in Appendix C.

**Table 4**      An updated list of psychosocial constructs based on the ethnographic interviews and the creative workshop

| Category | Theme | Codes | |
|---|---|---|---|
| Psychosocial constructs | Cognitive theme | Preference (69) | Reliability (12) |
| | | Convenience (47) | Confidence (8) |
| | | Health (40) | Independence (4) |
| | | Self-conscious (20) | Confusion (3) |
| | | Self-awareness (12) | Patriotism (1) |
| | Emotional theme | Satisfaction (with supermarket products and services) (42) | Sense of belonging (19) |
| | | | Frustration (9) |
| | | Self-esteem (44) | Anxiety (4) |
| | | Happiness (24) | Tiresomeness (3) |
| | | Enjoyability (19) | Safety (2) |
| | Social theme | Social activity (37) | Public attitude (5) |
| | | Social relationship (31) | Generational difference (3) |
| | | Social participation (17) | Support from others (3) |
| | | Public awareness (6) | Social service (2) |
| | | Public transportation (6) | Cultural context (1) |

Note: Provenance of the numbers in the brackets: number of occurrences.

### 3.3   Observation

### 3.3.1   Observational investigation protocol

Non-participant observations (fly-on-the-wall observation) were conducted to identify new psychosocial aspects and also to clarify the identified psychosocial issues from previous investigations by observing older individuals' real-time supermarket shopping. The criteria, i.e., aged 60 or over who mainly use medium-cost supermarket were adopted, and eight participants were recruited. The participants were asked to suggest the supermarket branch, date and time for observing their natural shopping behaviour. Information and consent forms were provided for both participants and the managers of the chosen supermarkets in advance. All the observations were conducted in London Borough of Hillingdon. The observations were performed by a single researcher so as to support the participants to shop comfortably as normal.

As a familiarisation step, an initial interview was conducted for approximately 30 minutes at the participant's home before each observation begin. Conducting the initial interviews allowed participants to become comfortable and familiar with the being observed and also encouraged them to shop as their normal routines. In the interview, the participants were asked regarding their backgrounds such as lifestyle, social activities, previous career, and their general shopping journey. A voice recorder was used to record the initial interviews. The complete set of questions is presented in the Appendix B.

After conducting the initial interview, the researcher was equipped with two digital video cameras (the second one is a spare), which is GoPro: HERO4 Session Action Camera, on both shoulder straps in order to record the participants' shopping journey. The participants were also equipped with an action camera to record any psychosocial

related incidents or aspects from their perspectives. The action cameras were equipped in the shoulder strap of a shoulder bag or backpack the participants and observer wore in order to not disturb participants' supermarket shopping. Figure 3 illustrates the observer and the participant with the action cameras. Also, the researcher made annotations by means of note-taking during the observations in order to avoid losing any possible data.

**Figure 3** Illustration of (a) the observer and (b) the participant with the action cameras (orange circles)



(a)                                                    (b)

The observation began from participants' outward journey to the chosen supermarket to identify any psychosocial aspects during the travelling to the supermarket such as the choice and experience of travel by taking public transportation, driving, or walking. In the supermarket, all the shopping experiences of the participants were observed for example any situations such as dropping items from the shelf, meeting other people, etc. For the same reasons as that of outward journeys, the participants' journeys from the supermarket to their home were also observed after participants completed their shopping. Each observation took approximately one hour. Figure 4 shows an illustration of the actual observation.

**Figure 4** An image of the observation conducted with two participants in Uxbridge (see online version for colours)

An after interview was carried out after completing the observation activity. The interview was conducted in each participant's home in order to seek further information and feedback. It took approximately 30 to 60 minutes. During the interview, the recorded video of participants' shopping journey was played in order to facilitate stimulate and recall their experiences. The participants were asked regarding their feelings, thoughts, and relevant behaviours in the situations observed during their shopping journey. For example, the questions included: 'Could you please tell me top three things you liked in your shopping journey today? And why?', and 'During the shopping, you had a chat with the lady at the pet section. Could you please describe this?'. The after interviews were also audio recorded using a voice recorder and then transcribed by the lead researcher.

**Table 5**      Identified themes and codes from the observational investigation

| Category | Theme | Codes | |
|---|---|---|---|
| Psychosocial constructs | Cognitive theme | Preference (125) | Confidence (13) |
| | | Convenience (87) | Familiarity (12) |
| | | Self-awareness of health (50) | Confusion (10) |
| | | Information (25) | Independence (6) |
| | | Self-conscious (22) | Fairness (4) |
| | | Helpfulness (17) | Patriotism (1) |
| | | Reliability (13) | |
| | Emotional theme | Satisfaction (with supermarket products and services) (90) | Frustration (16) |
| | | | Sense of belonging (22) |
| | | Self-esteem (47) | Tiresomeness (6) |
| | | Enjoyability (44) | Anxiety (4) |
| | | Happiness (25) | Embarrassment (4) |
| | | Pleasure (23) | Safety (2) |
| | Social theme | Social activity (48) | Public awareness (6) |
| | | Social relationship (42) | Support from others (5) |
| | | Socialising (inc. getting out) (26) | Generational difference (4) |
| | | Social participation (21) | Social service (3) |
| | | Public transportation (11) | Cultural factors (1) |
| | | Public attitude (9) | |

Note: Provenance of the numbers in the brackets: number of occurrences.

### 3.3.2   *Observational investigation data analysis*

The observational data analysis was guided by the responses of the initial and after interviews which helped to detect emotionally relevant events and priority issues. The initial and after interview transcripts were analysed by two coders, including one final year PhD researcher in design and one design researcher with over 15 years of experience. The participants' comments were coded and grouped based on their meaning and implications. Considering the data set of observation (interview transcripts) is same as that of the first investigation i.e. ethnographic interview, the data analysis methods and

process applied were the same. Several qualitative coding methods: domain and taxonomic coding, process coding, and NVivo software were adopted followed 'six phases of thematic analysis' (Braun and Clarke, 2006).

**Table 6**   Synthesised results from the three empirical investigations i.e. ethnographic interviews, creative workshop, and observations

| Theme | Sub-theme | Code (number of occurrences) |
|---|---|---|
| Cognitive | Cognitive judgement | Preference (supermarket products and services) (97) |
|  |  | Familiarity (45) |
|  |  | Helpfulness (supermarket products and services) (29) |
|  | Self-awareness | Self-awareness of age (97) |
|  |  | Self-awareness of health (56) |
| Emotional | Negative emotion (negative affect) | Frustration (28) |
|  |  | Self-consciousness (23) |
|  |  | Tiresomeness (annoyance and losing interest) (7) |
|  |  | Embarrassment (6) |
|  |  | Anxiety (4) |
|  | Positive emotion (positive affect) | Satisfaction (with supermarket products and services) (68) |
|  |  | Enjoyment (53) |
|  |  | Pleasure (46) |
|  |  | Sense of independence (1) |
| Social | Public attitude | Public awareness and language (23) |
|  |  | Generational differences (5) |
|  |  | Cultural differences (1) |
|  | Social activity | Hobbies (classes, clubs, etc.) (62) |
|  |  | Volunteering activities (24) |
|  | Socialising | Interaction with others in the supermarket (42) |
|  |  | Having guests (entertaining, hosting etc.) (8) |
|  | Socio-economic status (69) |  |
|  | Support and service | Support from others (16) |
|  |  | Social service (3) |
| Value | Happiness (37) |  |
|  | Life satisfaction | Sense of belonging (37) |
|  |  | Safety (2) |
|  | Self-esteem (61) | Self-confidence (19) |
|  |  | Self-satisfaction (18) |
|  | Social satisfaction | Trust and reliability (19) |
|  |  | Sustainability (9) |
|  |  | Fairness (6) |

Note: Provenance of the numbers in the brackets: number of occurrencess

### 3.3.3   Developed list of psychosocial aspects

Table 5 presents solely the list of 'Psychosocial constructs' category identified from the observations for convenience. The themes are organised in alphabetic order and the codes are paganised based on number of occurrences. A complete set of the data analysis results from the observations is available in Appendix E.

### 3.3.4   Synthesis of results from the three investigations

The analysed results from the above three investigations were synthesised by two coders (one final year design PhD researcher and one design researcher with over 15 years of experience) using thematic coding analysis methods: axial coding and NVivo software, which enhance the validity (Saldaña, 2015; Strauss and Corbin, 1998).

The common themes or sub-themes from the three investigations (ethnographic interviews, creative workshop, and observations) were merged or edited based on their implications and meanings. The individual themes or sub-themes were placed separately, and then combined, refined, discarded or placed in new themes or sub-themes. This process was repeatedly performed using NVivo software to compare different mixtures of the results in order to evaluate the analysed results. As the termination criteria, the '15 steps of checklist for thematic coding analysis' (Braun and Clarke, 2006) was adopted at the end of the analysis process.

Four main psychosocial constructs were identified. They were Cognitive theme, Emotional theme, Social theme, and Value theme. Table 6 presents the four main themes along with their associated subthemes. The frequency of occurrence presented in Table 6 was extracted from the combined thematic coding database of the three investigations. The themes and sub-themes are organised in alphabetic order and the codes are ordered according to their frequency of occurrence. The results pertaining to the concept of psychosocial inclusivity and the discussion of their interpretation are presented in the next chapter. The overall summary of the complete set of synthesised results from the three empirical investigations is provided in Appendix F.

## 4   Results

### 4.1   Cognitive theme

The 'cognitive' theme consists of two sub-themes which are 'cognitive judgement' and 'self-awareness'. The codes of each sub-theme were presented in Table 6.

'Cognition' is a broad and over-arching concept which is considered to be of high importance in various areas of application (Messick, 1994; Lazarus, 1991). Cognition is generally defined as "the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses" (Oxford English Dictionary, 2017a). In this study, Messick's (1994) definition of 'cognitive styles': "characteristic modes of perceiving, remembering, thinking, problem-solving, and decision making, reflective of information-processing regularities that develop in congenial ways around underlying personality trends" was used to describe the cognitive theme. The 'cognitive theme' categorised all those considerations and comments which expressed the older individuals' thinking, attitude, and behaviour during their shopping experiences. The most frequently mentioned codes by the participants were preference of supermarket

products and services (n = 97); self-awareness of age (n = 97); and self-awareness of health (n = 56). Indicative examples of participant comments include:

> [Preference] "Yes I got a later date on it. […] If I got the one it's gonna be expired by tomorrow, I would only use part of it, and it's going off a bit before I consume that, so I always hang around for the one with the most time left on it […] Yes, I only use even top 300 ml top like that I only ... that allows me five days. […] If it's few days left before it's expired, it's not very nice. It's gonna be passed expire date." (Male, 72)

> [Self-awareness of health] "I have a heart condition so I do need to watch my fats. I try to be careful with that, but other than that no I'm fine. Keep low on the salt if I can, I find that difficult, I'm a savoury person rather than a sweet one, much prefer savoury food to the sweet stuff." (Female, 80)

### 4.2 Emotional theme

'Emotional' theme included two sub-themes which are 'positive emotion' and 'negative emotion'. The codes of each sub-theme were presented in the Table 6.

'Emotion' is a broad over-arching concept, hence a lack of consensus on the definition of the term emotion in the existing literature (Mulligan and Scherer, 2012; Cole et al., 2004; Kleinginna and Kleinginna, 1981; Chaplin, 1962). In this paper, the definition of emotion proposed by English and Ava (1958): "a complex feeling-state accompanied by characteristic motor and glandular activities; or a complex behaviour in which the visceral construct predominates" was used. Within this definition, 'emotional' theme referred to senses or feeling related themes and codes caused by participants' circumstances, mood, or relations with others. The most noticeable emotions encountered during the supermarket shopping by the participants were satisfaction with supermarket products and services (n = 68); enjoyment (n = 53); pleasure (n = 46); frustration (n = 28); and self-consciousness (n = 23). Examples of specific comments include:

> [Satisfaction] "I like the bargain. And finding everything I am looking for is exactly in the same place it was in last week. That's quite satisfactory […] Well, when they move things. […] when you find an assistant, they are all very very helpful, really nice. They spend time to help you." (Female, 81)

> [Enjoyment] "Oh, quite often! I mean today we didn't, no chatting today at all. I didn't see anyone I knew, and I didn't see anyone else to speak to … oh we often do … especially, perhaps about cat food […] we are all doing the same things, we know what we are doing. And I will talk about it because we do." (Female, 80)

> [Pleasure] "Uhm well, I enjoy going there physically because often especially in the winter, the sun is going down, and the so very nice sky, and the yes they got the trees there and as I said little leaves coming out from the bottom, and they are so pretty." (Female, 81)

> [Frustration] "I mean I'll drive around here to go shopping and bits. But I don't enjoy it. So I'd rather go on the train if I go anywhere. Um, I think there's a bit of an old age thing really. […] I'm, not losing my confidence but I'm, I'm very, I'm not slow but I don't know. I just feel that I, I could cause an accident because perhaps, no, I don't know. Anyway, I don't, I don't enjoy it anymore so." (Female, 74)

[Self-consciousness] "I usually try to go at times when I know there's not going to be a lot of people there. Everybody's got to shop but it is difficult and I've got a fairly big scooter that I take over to [Supermarket A]." (Female, late 60)

## 4.3   Social theme

The 'social' theme included four sub-themes: 'social activity', 'sociallising', 'socio-economic status', 'public attitude' and 'support and service'. The codes of each sub-theme were presented in the Table 6.

Kaslow et al. (2007) have suggested the definition of 'social theme' as "physical environment, external stressors, family environment, interpersonal relationships, social support and isolation, role models, social expectations, value system, sociocultural factors, and culture". Social factors strongly affect human well-being and quality of life (Larson, 1996) and have interdependency with mental, emotional, and physical factors. In this study, 'Social' theme included any activities, services, support, public attitude and awareness which can affect older individuals' behaviour, thought, and feeling in their social life. The most frequently mentioned codes by the participants were socio-economic status (n = 69); hobbies (n = 62); interaction with others in the supermarket (42); volunteering activities (n = 24); and Public awareness and language (n = 23). Indicative examples of participant comments include:

[Socio-economic status] "I go to [Supermarket A] because I think they are better value in terms of price." [Male, 72]

[Hobbies (classes, clubs, etc.)] "Tomorrow there is my coffee morning group. Yesterday, I had to miss my scrabble group because it was my granddaughter's graduation in the Sussex. […] Tuesday is different scrabble group. Monday is I call a day off. Sunday, I go to a church in the morning, and friend comes to see me most Sunday afternoon." [Female, 80]

[Interaction with others in the supermarket] "I don't want to do online shopping because I like to go and see things and people." [Female, 80]

[Volunteering activities] "Since retirement, I tried to get involve to various activities mainly sort of volunteering activities." [Male, 72]

[Public awareness and language] "But it just makes it easier for the general public as well. Because it's difficult when you're in there on a scooter for them to get around you, and very often they don't see you. I mean I wear a lime green jacket which you'll see when we go over. And very often people, they'll walk into me and they'll say, 'Oh, sorry! Didn't see you there.' And my scooter's quite big as well!" [Female, late 60]

## 4.4   Value theme

The 'value' theme included four sub-themes; 'life-satisfaction', 'happiness', 'self-esteem', and 'social-satisfaction'. The codes of each sub-theme were presented in Table 6.

Saura et al. (2008) and Zeithaml, (1988) argued that 'value' is a multi-faceted and wide-spanning concept used in fields as diverse as ethics, physics, mathematics, music, chemistry, business, and marketing. Diener and Suh (1997) have proposed three bases that can identify what is valuable or not to an individual. The three bases are judgement of satisfaction, continuous choice, and judgement with reference to cultural norms or

value system. In this paper, the Oxford English Dictionary (2017b) definition was used as reference: "principles or standards of behaviour; one's judgment of what is important in life". Within this definition, participants' feelings and thoughts about themselves, their experiences of shopping, and general life were extracted and detailed in this theme. The most frequently raised codes were sense of belonging (n = 37), happiness (n = 37), self-confidence (n = 19), and trust and reliability (n = 19). Indicative examples of participant comments include:

> [Sense of belonging] "[…] I always try to go to the counter to see people I know that I recognise would be pleased to say you know "you've had a haircut, nice today." "did you have a nice holiday?" or maybe it's 5 o'clock evening, "you are going home soon are you tired?" […]" (Female, 85)

> [Happiness] "Going to the supermarket with my partner is the happiest thing" (Female, 73)

> [Self-confidence] "It is easy to use the self-checkout machine. […] Yes, I know that other old people have difficulty to use it, but we don't have any trouble. It's convenient" (Male, 75)

> [Trust and reliability] "If you shop carefully at Supermarket A, a lot of their stuff is not much more expensive, and you get quality […] Supermarket B has quality but Supermarket B isn't as reliable as Supermarket A" (Female, 70)

## 5    Discussion

Two research questions were addressed in this study:

a    Do psychosocial aspects affect older individuals' supermarket shopping experiences?

b    What are the possible psychosocial constructs that need to be considered for better inclusivity in shopping?

These research questions were answered through three empirical research methods: ethnographic interviews, creative workshop, and observations. The psychosocial aspects of supermarket shopping of older individuals which emerged from the analysed data were named Cognitive, Emotional, Social, and Value themes.

### 5.1    Psychosocial constructs

#### 5.1.1    Cognitive theme

The results suggested that the shopping experience of older individuals is influenced by several cognitive factors which were found to involve two sub-themes of 'cognitive judgement' and 'self-awareness'.

The results confirmed *preference of supermarket products and services*, *familiarity* (Pechey and Monsivais, 2015; Vyth et al., 2010; Vannoppen et al., 2002; Arora and Stoner, 1996) as codes of the sub-theme 'cognitive judgement' as noted by previous researchers.

However, 'self-awareness of one's age and health' and 'helpfulness (supermarket products and services)' which had not been specifically identified by previous researchers, was identified and confirmed as an additional sub-theme. The identified sub-themes and codes are the important determinant in the older individuals' supermarket

shopping regarding a choice of supermarket branch, product, or service. The sub-themes and codes are linked and affected to/by other themes (i.e., social, emotional, and value). In one instance, one of the participants made the choice of supermarket brand based on awareness of her health condition, public attitude (social theme), and satisfaction of supermarket service (emotional theme).

### 5.1.2  Emotional theme

The results suggested that the shopping experience of older individuals is influenced by not only physical factors but also emotional factors (e.g., feelings of frustration, self-consciousness, and pleasure).

Existing literature on supermarket shopping highlights emotional reaction as an important factor mostly considered for marketing purposes by supermarkets. Ambler et al. (2004) stress the importance of emotional reaction as one key driver for consumer decision making.

This study noted a richer spectrum of considerations by identifying the positive and negative emotions experienced by shoppers during their supermarket shopping activities. An illustration of this was the one of the participants who stressed negative emotions of Self-consciousness and Embarrassment in the process of borrowing a mobility scooter in the supermarket. The older shopper had to que at customer service for a considerable amount of time and also had to speak to security in order to rent a mobility scooter and its key. In this case, the supermarket aimed to improve accessibility, usability, and convenience for shoppers in supermarket through providing mobility assistance. However, the old shopper experienced feeling embarrassed, uncomfortable, self-conscious, and also psychosocial exclusion, due to the unnecessary and complex process of renting a scooter. This suggests that focussing solely on physical aspects of inclusivity in supermarkets can lead to negative emotional experiences for the older individuals.

### 5.1.3  Social theme

The results suggested that the shopping experience of older individuals is affected by 'social' theme (e.g., choosing stores, transportation, supermarket products and services, feeling positive or negative emotions, and gaining motivation for shopping). The social theme which can be categorised under four sub-themes of social activity, socio-economic status, public attitude, and support and service.

The results confirmed 'Socio-economic status' as an important social factor as identified previously in the literature (Pechey et al., 2013; Appelhans et al., 2012; UK Department for Environment, Food and Rural Affairs, 2012; Giskes et al., 2010; Darmon and Drewnowski, 2008; Aylott and Mitchell, 1998).

However, a number of social related sub-themes 'social activities', 'public attitude', and 'support and service', were also identified through the investigations, possibly for the first time. Several participants emphasised how their shopping experiences were significantly affected or mainly driven by social factors on various occasions e.g. spending time with partner, shop for neighbours who are physically unable to shop, or going to supermarket to meet or see people. This highlights the social prominence of supermarket shopping experience and why design for social inclusivity beyond physical access should be a key consideration.

### 5.1.4 Value theme

The results suggested that the shopping experience of older individuals is affected by certain values (happiness, life-satisfaction, social satisfaction, and self-esteem) which have a crucial influence. For example, feelings of 'happiness' when going to a supermarket with a partner or seeing the sunset on the way back home from shopping appear to be difficult to separate from the specific shopping events and interactions. It can be explained that individuals' subjective wellbeing and happiness can be enhanced by services and products which support life narrative (Jordan, et al., 2017).

The results re-confirmed 'life-satisfaction' and self-satisfaction as already identified in the literature. Literature supports the correlation between shoppers' well-being and their shopping experience at supermarkets and malls (Grzeskowiak et al., 2016; Wagner, 2007; Lavin, 2005). Also, satisfaction with the state of health is seen as one of the constructs that affect older individuals' shopping behaviour (Ishikawa et al., 2017).

However, results from this study suggested additional sub-themes including 'happiness', 'self-esteem' and 'social-satisfaction' as relevant values. Several new codes for each sub-theme were also identified. Participants implied satisfaction with their life or society through their shopping experiences (e.g., feeling a sense of belonging by engaging with others in their shopping experience, choosing fair trade products, or having trust in products and services in the supermarket). This highlights the link between certain values and quality of shopping experiences and that considering older shoppers 'core values' could lead to better shopping experiences for them.

In addition to considering each psychosocial construct (i.e., cognitive, social, emotional and value) individually, the data collected during the current study suggests the need for evaluating the constructs due to the correlations between codes. This is because many statements collected as part of the research involved joint concept, with codes from two or more themes being used to describe the same thought, desire or need. This is particularly important when designing for psychosocially inclusive shopping experiences so as to adopt a holistic, connected and convergent approach. Therefore, the current findings can be developed as a complete set of model, framework or toolkit by conducting further investigations so as to be used for designing psychosocially inclusive supermarket for older individuals.

### 5.2 Contribution to knowledge

This paper has two main contributions to knowledge:

a  enhancing the knowledge of psychosocial inclusivity in supermarket design for older people by establishing its current relevance and importance

b  suggesting constructs for psychosocial inclusivity in supermarket design for older individuals.

### 5.3 Strength

The strength of this study can be explained by its *originality*, *significance* and *rigour*.

- *Originality:* in the design of older people' supermarket shopping, the previous understanding of psychosocial inclusivity was somewhat limited. This paper has highlighted the current limitations of older people's supermarket shopping and has

proposed the related constructs of psychosocial aspects in older people's supermarket shopping on the empirical investigations.

- *Significance:* in the context of older people' supermarket shopping, the concept of psychosocial aspects was explored through this paper. It can be argued that the paper can play a significant role in expanding the notion of psychosocial aspects in supermarket design for older people' better shopping experience.

- *Rigour:* the paper was thoroughly designed using three empirical methods which involved an appropriate number of participants. Data triangulation approach was applied so as to enhance the rigour of the study.

### 5.4   *Limitations*

In this study, there are methodological limitations which are the sampling and data collection. There was a gender imbalance in recruiting participants [male: 18 and female: 40 (Table 2)]. It can be explained that female shoppers consider supermarket shopping more important than male shoppers do (Mortimer and Clarke, 2011). Furthermore, the total number of study participants (N = 58) could be viewed as a relatively small sample. However, Robson and McCartan (2016) empathise that there is not one particular sample size as various factors are to be considered in research design. In this paper, a research triangulation approach was applied in order to achieve the greatest potential validity from the relatively small sample size.

The scope of this study was limited to shopping experiences of older individuals. Considering the concept of inclusive design is wide, other key contexts of inclusive design beyond shopping need to also be considered and investigated for thoroughly exploring the concept of psychosocial inclusivity in design. The current findings provide only initial constructs for extending the concept of inclusive design but can only be considered a first, preliminary step.

## 6   Conclusions and future work

### 6.1   *Conclusions*

Despite the established importance of inclusive design in various contexts, current understanding of inclusive design is rather limited in its application (Persson et al., 2015). This is partially due to lack of understanding of psychosocial aspects in design. In this paper, the supermarket shopping of older individuals was selected as a first context for exploring the nature and role of psychosocial inclusivity. The explorations were performed through adopting three human centred design methods with a total of 58 older individuals: ethnographic interviews (n = 31), creative workshop (n = 19), and observations (n = 8).

Several psychosocial aspects in older individuals' supermarket shopping were identified through these investigations using thematic analysis, under four major constructs: 'cognitive', 'emotional', 'social', and 'value' (Table 6). Further sub-themes and codes were also identified and categorised into these major themes based on their meaning or implications. Several psychosocial aspects can be found in the existing literature, although specific details of the four constructs are not well established in

previous research. This is possibly explained due to psychosocial aspects being less visible and explicit, and thus more complex and challenging in terms of definition, measurement and improvement.

The findings of this paper suggest:

a   the importance of psychosocial inclusivity in older individuals' supermarket shopping

b   a partial list of constructs for psychosocial inclusivity in design that can be extended through further studies.

### 6.2   Future research

This paper is part of a research project which aims to explore the concept of psychosocial inclusivity in design (Lim, 2018). The investigations in this paper were conducted to cover the psychosocial aspects of supermarket shopping for older individuals. When considering diverse contexts of inclusive design, however, additional contexts are needed to provide universal validity and practicality of the results.

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## Appendix A

*Ethnographic interview questions for the ethnographic interview*

| Phase | | Question |
|---|---|---|
| Phase 1: Warm-up questions | 1 | Could you briefly introduce yourself (and your partner) in terms of your family, previous career, friends, social activities, habits and lifestyle? |
| | 2 | How many grocery shopping trips have you had in the last 2 weeks? How many different shops have you visited for your groceries in that time? Why did you choose to visit these stores? (e.g., supermarket shop, convenience store, local grocer, baker, butcher, and discounters) |
| | 3 | If you could change one thing about the supermarket what would it be? |
| Phase 2: Lifestyle and habits | 1 | Do you enjoy cooking? |
| | 2 | What do you eat on a typical day? (breakfast, lunch, dinner, snacks) |
| | 3 | Have you eaten out in the last fortnight? If so, how many times? (e.g., lunch club, restaurant, invited to friend/family) |
| Phase 3: Health and well-being (+cognitive age) | 1 | How has your health in general been in the last year? |
| | 2 | You suggested before that you have no long-term illnesses or disabilities, is this correct? OR You told the other researcher that you have (arthritis, high blood pressure etc.), how does this affect your daily life? |
| | 3 | How old do you feel at the moment? |
| | 4 | How old do you think others perceive you to be? |
| | 5 | What age do you think you are most like based on the activities you do and how active you are? |
| | 6 | How old do you think you are based your interests? |
| | 7 | If you could be any age, what age would you most like to be? |

## Appendix B

*Identified themes and codes from the ethnographic interviews*

| Category | Theme | Codes | |
|---|---|---|---|
| Psychosocial constructs | Cognitive theme | Preference (25) | Reliability (9) |
| | | Health (19) | Independence (4) |
| | | Convenience (17) | Confidence (3) |
| | | Self-conscious (15) | Confusion (3) |
| | | Self-awareness (10) | Patriotism (1) |
| | Emotional theme | Satisfaction (with supermarket products and services) (22) | Sense of belonging (11) |
| | | | Frustration (7) |
| | | Self-esteem (22) | Anxiety (4) |
| | | Enjoyability (15) | Tiresomeness (2) |
| | | Happiness (14) | Safety (1) |
| | Social theme | Social relationship (17) | Public attitude (3) |
| | | Social activity (16) | Public awareness (3) |
| | | Social participation (10) | Support from others (3) |
| | | Public transportation (4) | Social service (2) |
| | | Generational difference (3) | Cultural difference (1) |
| General background | Health | Health detail (18) | |
| | | Mobility (10) | |
| | | Diet behaviour (25) | |
| | | Physical condition (26) | |
| | Family | Family relationship (25) | |
| | | Family support (12) | |
| | Background (28) | | |
| | Personal and social activity (18) | | |
| | Behaviour (13) | | |
| | Ability or skill (3) | | |
| | Knowledge and experience (3) | | |
| | Surrounding environment (1) | | |

*Identified themes and codes from the ethnographic interviews (continued)*

| Category | Theme | Codes | |
|---|---|---|---|
| Shopping | Accessibility | Accessibility of Aisle (2) | Distance (7) |
| | Affordability (9) | | |
| | Facilities | Surrounding facilities (toilet, café etc.) (8) | Store atmosphere (6) |
| | | | Self-checkout (3) |
| | | Trolley (7) | |
| | Items | Variety (22) | Locating items (5) |
| | | Quality (12) | Visibility (4) |
| | | Portability (7) | Portion size (1) |
| | Service | Staff (6) | Fairness (2) |
| | | Queueing (3) | Hours of use (1) |
| | Shopping behaviour | Frequency (12) | Online shopping (2) |
| | Surrounding atmosphere (2) | | |
| Others | | Accessibility (19) | Simplicity (1) |
| | | Efficiency (6) | Speciality (6) |
| | | Helpfulness (4) | Sustainability (2) |
| | | Information (6) | Usability (13) |

## Appendix C

*Updated themes and codes based on the ethnographic interviews and the creative workshop*

| Category | Theme | Codes | |
|---|---|---|---|
| Psychosocial constructs | Cognitive theme | Preference (69) | Reliability (12) |
| | | Convenience (47) | Confidence (8) |
| | | Health (40) | Independence (4) |
| | | Self-conscious (20) | Confusion (3) |
| | | Self-awareness (12) | Patriotism (1) |
| | Emotional theme | Satisfaction (with supermarket products and services) (42) | Sense of belonging (19) |
| | | | Frustration (9) |
| | | Self-esteem (44) | Anxiety (4) |
| | | Happiness (24) | Tiresomeness (3) |
| | | Enjoyability (19) | Safety (2) |
| | Social theme | Social activity (37) | Public attitude (5) |
| | | Social relationship (31) | Generational difference (3) |
| | | Social participation (17) | Support from others (3) |
| | | Public awareness (6) | Social service (2) |
| | | Public transportation (6) | Cultural context (1) |

*Updated themes and codes based on the ethnographic interviews and the creative workshop (continued)*

| Category | Theme | Codes | |
|---|---|---|---|
| General background | Health | Physical condition (60) | Health details (28) |
| | | Diet behaviour (52) | Mobility (17) |
| | Family | Family relationship (45) | Family support (17) |
| | Personal and social activity (45) | | |
| | Background (30) | | |
| | Behaviour (23) | | |
| | Knowledge and experience (4) | | |
| | Ability or skill (3) | | |
| | Surrounding environment (1) | | |
| Shopping | Accessibility | Distance to store (9) | Accessibility of Aisle (2) |
| | Affordability (14) | | |
| | Facilities | Surrounding facilities (Toilet, café etc.) (13) | Store atmosphere (7) |
| | | | Self-checkout (3) |
| | | Trolley (12) | |
| | Items | Variety (29) | Visibility (5) |
| | | Quality (20) | Location of items (4) |
| | | Portability (8) | Portion size (2) |
| | Service | Staff (9) | Queueing (3) |
| | | Fairness (3) | Hours of use (2) |
| | Shopping behaviour | Shopping Frequency (18) | Online shopping (2) |
| | Surrounding atmosphere (8) | | |
| Others | | Accessibility (36) | Information (5) |
| | | Usability (27) | Speciality (6) |
| | | Efficiency (12) | Sustainability (6) |
| | | Helpfulness (7) | |

## Appendix D

*Initial and supporting interview questions*

| Phase | Question |
| --- | --- |
| Phase 1: Initial interview | • Could you please briefly introduce yourself in terms of your family, previous career, social activities and relationships, habits and lifestyle? |
| | • Which supermarket do you usually go for shopping and why? |
| | • Could you please briefly describe your shopping journey? |
| Phase 2: Supporting interview | *Questions based on the observations:* |
| | • e.g., While you were in the supermarket, the supermarket was quite crowd and noisy. Did it affect your shopping? If yes, how and why? |
| | • e.g., You used self-checkout machine at the end of the shopping. Please tell me anything you thought or felt about the using self-checkout machine. |
| | *Common questions:* |
| | • Could you please tell me top three things you do not like from the shopping journey today? And why? |
| | • Could you please tell me top three things you like from the shopping journey today? And why |

## Appendix E

*Identified themes and codes from the observation*

| Category | Theme | Codes | |
| --- | --- | --- | --- |
| Psychosocial constructs | Cognitive theme | Preference (125) | Reliability (13) |
| | | Convenience (87) | Familiarity (12) |
| | | Self-awareness of health (50) | Confusion (10) |
| | | Information (25) | Independence (6) |
| | | Self-conscious (22) | Fairness (4) |
| | | Helpfulness (17) | Patriotism (1) |
| | | Confidence (13) | |
| | Emotional theme | Satisfaction (with supermarket products and services) (90) | Sense of belonging (22) |
| | | Self-esteem (47) | Frustration (16) |
| | | Enjoyability (44) | Tiresomeness (6) |
| | | Happiness (25) | Anxiety (4) |
| | | Pleasure (23) | Embarrassment (4) |
| | | | Safety (2) |

*Identified themes and codes from the observation (continued)*

| Category | Theme | Codes | |
|---|---|---|---|
| | Social theme | Social activity (48) | Public attitude (9) |
| | | Social relationship (42) | Public awareness (6) |
| | | Socialising (inc. getting out) (26) | Support from others (5) |
| | | | Generational difference (4) |
| | | Social participation (21) | Social service (3) |
| | | Public transportation (11) | Cultural factors (1) |
| General background | Health | Physical condition (61) | Health detail (28) |
| | | Diet behaviour (45) | Mobility (17) |
| | Family | Family relationship (50) | Family support (19) |
| | Personal and social activity (54) | | |
| | Knowledge and experience (9) | | |
| | Ability or skill (4) | | |
| | Surrounding environment (1) | | |
| Shopping | Items | Variety (54) | Labels (7) |
| | | Quality (36) | Portion size (inc. item size) (6) |
| | | Price (30) | Fairness (4) |
| | | Locating items (17) | Expiry date (2) |
| | | Portability (17) | Packaging (2) |
| | Facilities | Surrounding facilities (toilet, café, etc.) (34) | Self-checkout (5) |
| | | | Aisle (4) |
| | | Trolley (25) | Shelves (4) |
| | | Checkout (7) | Sign (4) |
| | | Disability facilities (7) | Induction loop (1) |
| | Service | Staff (25) | Disability service (5) |
| | | Offer (8) | Hours of use (5) |
| | | Online shopping (6) | Delivery (3) |
| | | Queueing (6) | |
| | Store environment | Interior and layout (17) | Crowd (4) |
| | | Atmosphere (7) | Temperature (1) |
| | | Cleanliness (4) | |
| | Shopping frequency (22) | | |
| | Distance to stores (14) | | |
| | Weather (2) | | |
| Others | | Accessibility (53) | Practicality (13) |
| | | Usability (52) | Visibility (7) |
| | | Efficiency (33) | Sustainability (6) |

# Appendix F

*Synthesised results of three investigations regarding supermarket shopping*

|  | Theme | Codes | |
| --- | --- | --- | --- |
| General background | Health | Diet behaviour (64) | Health detail (29) |
|  |  | Physical condition (61) | Mobility (26) |
|  | Family | Family relationship (53) | Family support (19) |
|  | Personal activity (54) | | |
|  | Sociability (49) | | |
|  | Knowledge and experience (9) | | |
|  | Ability or skill (4) | | |
| Shopping | Items | Variety (58) | Labels (10) |
|  |  | Price (incl. value of items) (46) | Portion and item size (8) |
|  |  |  | Packaging (2) |
|  |  | Quality (46) | Fairness (4) |
|  |  | Locating items (21) | Expiry date (2) |
|  |  | Portability (17) | |
|  | Service | Staff (43) | Disability service (6) |
|  |  | Information (35) | Hours of use (5) |
|  |  | Offer (12) | Delivery (4) |
|  |  | Queueing (7) | |
|  | Shopping behaviour | Price comparison (52) | Online shopping (8) |
|  |  | Frequency of visit (30) | Size comparison (4) |
|  |  | Diet behaviour (8) | Hours of visit (2) |
|  | Facilities | Trolley (25) | Aisle (5) |
|  |  | Checkout (9) | Sign (4) |
|  |  | Shelves (9) | Induction loop (1) |
|  |  | Disability facilities (8) | Lift (1) |
|  |  | Self-checkout (8) | |
|  | Store environment | Interior and layout (20) | Cleanliness (5) |
|  |  | Atmosphere (8) | Crowd (5) |
|  |  | Distance to supermarket (8) | Temperature (1) |
|  | Surrounding facilities | Car park (11) | Café (7) |
|  |  | Public transportation – bus and taxi (10/3) | Toilets (4) |
|  |  |  | Parking machine (2) |
|  |  | Other shops (bakery, butcher shop, etc.) (8) | Seats (2) |
|  |  |  | Location of supermarket (1) |
|  | Weather | Bad weather (4) | |
| Others |  | Convenience (179) | Accessibility (111) |
|  |  | Usability (161) | Visibility (14) |
|  |  | Efficiency (132) | Practicality (30) |