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**Collaborative and Social Interaction within Groups of Patrons in  
Academic and Public Libraries: Implications for Digital Libraries**

**A study submitted in partial fulfilment  
Of the requirements for the degree**

**Of**

**Master of Computer Science**

**At**

**The University of Waikato**

**By**

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## Abstract

This Master's thesis investigates patrons' information-seeking behaviour in physical libraries. Information available to meet patron's information needs, and constraints that limit the use of this information have been examined by a number of researchers in the last few years. However, there is a dearth of literature on the information-seeking processes, including the act of selecting books from shelves, and the kind of social interaction that may occur between patrons attending the library in groups. To address this gap we identified in the literature, this thesis used a qualitative method to investigate the behaviour of patrons when visiting libraries, and the way patrons within groups treat each other from the time they enter the library until they leave. 83 groups were observed in both public and academic libraries, totalling 217 participants. The observations and analysis of the study results increase our understanding of collaborative behaviour, group characteristics and other influential factors, such as location, time, physical environment, ambience and layout of the library. Our study also compared the findings with some previous work on similar concepts. Most findings highlight possible implications of social and book interaction in digital libraries, and emphasise the need to support more group collaboration among users of Digital Libraries, without limitations of shared time or location.

**Keywords:** collaborative information behaviour, social interaction, digital libraries.

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# Chapter 1: Introduction

## 1.1 Motivation

This thesis explores how groups of participants use physical libraries. We<sup>1</sup> wish to examine their behaviour and identify possible factors that influence their behavioural patterns and book decisions. From these observations, we aim to draw conclusions in how to best support groups of users of Digital Libraries (DLs).

### Studies in physical libraries and bookshops

A number of studies have already explored the behaviour of people selecting books in libraries and bookshops. For example, Timpany, et al. (2012) observed that most pairs of patrons go directly to a library section, without first consulting a catalogue. They were found to collaborate as to increase the chances of selecting the appropriate book. Conversely, Buchanan and McKay (2011) found that most patrons in bookshops did not open the books when making purchase decisions. This seems to indicate that the environment may affect the communication and interaction activities of the patrons. A number of influential factors have been identified, such as location, time, physical environment, ambience and layout. The physical appearance of books is also an important factor in the selection process, as demonstrated by Stelmaszewska and Blandford (2004). Moore (1995) found that children follow a routine or a pattern when interacting with books, and that they focus on book characteristics (e.g., colour or size) more than other factors. Children preferred to select the first related book on the shelf instead of browsing and selecting the most satisfying book to suit their needs. Studies by Hinze et al. (2012) and McKay et al. (2012a) observed a wide range of adults seeking books in libraries, and found that covers are important, as readers make decisions based on the perceived age of the book. Furthermore, factors such as the position of the shelves or lack of sorting space can adversely affect the book selection process (Hinze et al, 2012). Moreover, search techniques used in bookshops and libraries were found to differ.

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<sup>1</sup> On recommendation of the supervisor, this thesis uses “we” in reference to the author. This does not mean to indicate in any way that the work reported in this thesis has not been executed by the author alone. All coding, analysis and write-up are the work of the author.

## Studies in Digital Libraries

Searching for books in Digital Libraries does not support the kind of browsing activity that physical libraries allow for. Search in DLs requires the user accurately specify their search target, as this data is encoded in the DL metadata. Inaccuracies in the search data a patron provides can complicate the search and raise concerns about the reliability of the search (Renda & Straccia, 2005). Inaccuracies in the metadata provided has also been found to inadvertently affect a patrons search success (McKay et al. 2012). Furthermore, the presentation of documents in digital libraries can be frustrating because each user faces the task alone and lacks the support and company of peers as Digital Libraries do not support the notion of groups of patrons. Cunningham et al. (2013) has shown that DLs lack the aspect of group collaboration, and users of DLs do not have the support and assistance of other users who can provide feedback and comments on the content of their search. They concluded that more developments need to be done and new applications need to be introduced to support group collaboration in DLs.

## Individual vs group

In a previous study, we observed that readers usually visited bookshops in groups, and did not always have a definite idea of where to begin their search but instead engaged in casual browsing (Alqurashi, 2013). By doing so, patrons were not always accurate or efficient in their book selection, but they still enjoyed the bookshop experience. Patrons were observed to engage in social interaction and searched collaboratively for books, held discussions and gave advice and feedback on books. However, we note a scarcity of literature on academic or public libraries as places for socialising or leisure. Most observational studies have conducted in physical libraries focused on the *individual* information-seeking behaviour of patrons. Trager's study (2005) discussed the bookshop café as a social space, demonstrating that readers in bookshops began their searches in an informal, casual manner, and treated bookshops as social places.

Capturing collaborative searching and social interactions in physical libraries could lay the foundation for enhanced interface functions and features in digital libraries that support group collaboration and interaction among users. There appears to be a further gap in the literature, as little research exists on the support

of group interaction in Digital Libraries and so far little discussion of the challenges facing the implementation of such social aspects into DLs has occurred.

## **1.2 Focus of this thesis**

This thesis aims to address the lack of studies focusing on groups of patrons in physical libraries. We describe here our observational study that followed groups of patrons to three Public Libraries in Hamilton, New Zealand, and the academic library of the University of Waikato. We sought to examine the differences and similarities between the book selection processes of groups in a variety of locations. We also considered some aspects that have not previously been discussed in sufficient depth, such as the efficiency of group patrons' contribution in searching and selecting information resources, and their collaborative behaviour. This thesis further explores possible implications for digital libraries, particularly in synchronous and asynchronous interactions between groups of users.

In analysing our study observations, we use descriptive narratives of the information-seeking processes of groups of patrons to gain insight into their book selection approaches. Analysing patrons' interactions with books, shelves and each other within a group can help identify the patrons' priorities, motivations and strategies in their search activities. Such analysis also acknowledges the social aspects of academic and public libraries.

In particular, three research questions are explored in this thesis with regards to groups of patrons in public and academic library experiences:

1. What search strategies do people use when they visit a library in a group?
2. What social interaction can be observed between group members in public libraries? Are they similar to those observed in academic libraries?
3. What conclusions can be drawn from group observations in libraries for the design of digital libraries?

The questions addressed in this project and reported in this thesis offer a number of benefits. First, the findings from such a qualitative study could benefit programmers interested in developing interactive DLs and eBooks. Second, the

study could promote some suggestions that provide a social space for digital group users to enjoy accessing information and spending time with others.

### **1.3 Prior work and publications**

This thesis is an extension of work begun in the researcher's Postgraduate Diploma Thesis (Alqurashi, 2013). Elements of this prior work and parts of the research presented in this Master's thesis have already been published (reverse order list):

- Annika Hinze, Hayat Alqurashi, Nicholas Vanderschantz, Claire Timpany and Saad Alzahrani: "Social Information Behaviour in Physical Libraries: Implications for the design of digital libraries", *Proceedings of the Digital Libraries 2014 (joint conference of ACM/IEEE Joint Conference on Digital Libraries (JCDL 2014) and International Conference on Theory and Practice of Digital Libraries (TPDL 2014))*, to appear
- Cunningham, Sally Jo ; Alqurashi, Hayat ; Hinze, Annika ; Vanderschantz, Nicholas ; Timpany, Claire ; Heese, Ralf : "Browsing and book selection in the physical library shelves" Working paper 2/2013, University of Waikato, Department of Computer Science, 2013
- Timpany, Claire; Alqurashi, Hayat; Hinze, Annika; Cunningham, Sally Jo; Vanderschantz, Nicholas "Shared browsing and book selection in an academic library ", Working paper 5/2012, University of Waikato, Department of Computer Science, 2012

### **1.4 Outline of the thesis**

This thesis consists of six chapters and an appendix. Chapter 1 provides a brief background and introduction on information-seeking behaviour and social interaction between group users in public and academic libraries and bookshops. The importance of the study, its methodology, a problem statement, and the research questions are contained within Chapter 1. Chapter 2 provides a review of related work. Chapter 3 presents the methodology employed in the research, the

rationale for qualitative research, the strategies the researcher followed in selecting participants, the type of data collection method/s used in the research, and explains how the data was analysed. Chapter 4 separately summarises the data collected in public and academic libraries, and provides the study results relating to patrons' motivations, in line with the themes that emerged from the observation. This chapter also discusses those findings. In Chapter 5, user group interaction is presented, along with analyses of the existing work on group collaboration in DLs, and the relationship of this existing work with the current study's findings. This chapter also discusses the study's findings in this area. Chapter 6 concludes by addressing the limitations of the study. It suggests areas for future research, and offers recommendations. The appendix provides the raw data from the observations.

## **Chapter 2: Related work**

### **2.1 Overview**

This chapter reviews the literature on selecting and browsing books in physical and digital libraries. The review addresses patron behaviour and processes they follow while interacting with each other and their environment. The chapter begins by addressing how patrons interact with library shelves, and gives a general idea of book selection in physical and digital libraries (Section 2.2.). We then review the literature that pinpoints the social and collaborative aspects of libraries, respectively (Sections 2.3 and 2.4).

### **2.2 Book selection behaviour in physical and digital libraries**

Book selection behaviour in physical and digital libraries has been widely considered in the recent literature. Studies have focused on book selection strategies in academic and school libraries and bookshops, highlighting the physical features that can influence readers in making decisions in their book selection. This section provides an overview of studies done in physical libraries, bookshops and digital libraries.

#### **2.2.1 Academic libraries**

Timpany et al. (2012) observed how readers in university libraries find books. Their focus was on how books are selected from physical collections, and what interactions occur between patrons when they work together in browsing for books. The participant observations were conducted anonymously, and patrons were observed for five to 45 minutes. The researchers were able to observe interaction and patron behaviour from the time the patrons entered the library to when they left. The study found that most patrons access sections of the library directly, without considering the library catalogue. They observed how small groups (usually pairs) of patrons collaborated on finding the most appropriate books. They usually selected a book from the shelf, and then looked at the spine and the title. Typically at least one of a pair of patrons interacted with the books (e.g., reading spines, touching, pulling books).



Hinze et al. (2012) suggested that the environment plays an important role when selecting books in physical libraries. They observed that when the space for searching is small and shelves are not comfortably positioned, the book selection process will be adversely affected

Brand-Gruwel et al (2005) compared novice and expert techniques for selecting books. They concluded that experts and beginners widely differed in the skills they used to search for information, employing different patterns like strategizing, accessing, evaluating and synthesis. The authors hypothesized that experts use prior information skills to locate information, and that this affects both information-searching and information-seeking attitudes.

### **2.2.2 School libraries**

Reutzel and Gali (1998) examined the physical library book selection behaviour of school children. They found that most students follow the same pattern, focusing on a books' key characteristics more than any other factors. Students are often already familiar with the school library environment, which subconsciously affects their process of selection. The study observed that school students usually retrieve a book from the shelf, read the cover and title, flip the pages, read inside the book and peruse the illustrations. However, external and internal limitations may affect school students' selection process: For example, the physical characteristics of the books may influence the way children select them. The authors also stressed the importance to study the selection process of patrons in different settings.

Moore (1995) studied elementary students on how they select, interact with and retrieve information from a physical library, using their cognitive skills. Twenty-three grade six students were examined via interviews, as well as being observed while undertaking assigned tasks. The students first checked the catalogue and numbers, and went to the respective shelves. They selected the first relevant book that appeared in their search, instead of browsing through all results. The titles were used to find matches with their subject. Only some students used alternative terms to select books. The study concluded that a few factors might help successfully locate the most relevant materials in library, such as identifying the required information and keywords, considering questions asked and a deep understanding of the library setting. The study concludes that if the questions are

clearly stated, the chance of getting relevant information increases for the students. This study did not examine difficulties that arise from selecting search terms, meaning that it cannot be determined how successful the students' information expression was.

### **2.2.3 Bookshops**

Buchanan and McKay (2011) observed the selection strategies used by bookshop patrons. Their results showed that when readers search in bookshops, they usually have information about the author, book title or publication details. A book's physical quality, such as colour, thickness and so forth was used by a small number of customers to make book selection decisions. The study also discovered that some shoppers did not even open the books when making their purchase decisions as noted by other researchers. They observed how these findings affect the levels of understanding of the information seekers.

### **2.2.4 Digital libraries and eBooks**

McKay et al. (2012b) examined how readers make decisions about shortlisted books after examining the metadata information presented in the shortlist. McKay et al.'s study used data from Swinburne University in Melbourne, and focused on three main categories: the way readers review books, how much time they spend searching for a book and how characteristics of a book are examined. The findings highlight how eBook collections are used. The cover page is the biggest factor influencing the selection of a book. Many readers also used the index, bibliography or concluding sections. The amount of time spent making decisions differed; some users spent five to ten minutes browsing, while others spent much longer. The study explained that when readers choose books after a thorough search, they are more likely to read the books, in contrast to those who spend less time. In most cases, readers only studied the first three pages, then moved on. In other cases, they returned to previous chapters, in the case of eBooks. This was not observed for physical books.

Furthermore, Buchanan and McKay (2011) studied several online bookstores, such as Amazon, to attain better information about the searched for material. This study used bibliographic details, and reported that the publisher, author and year of publication are used as non-title bibliographic data. When this information is

used for searching, it helps the user find the appropriate book. It was also found that some users searched for books according to thickness and colour.

The process of selecting books is also very different in DLs compared to physical libraries. For example, Hinze et al. (2012) observed how DLs do present different issues compared to physical libraries. When one searches in DLs, infinite number of results are produced. Furthermore, users can rearrange their digital shelves according to their interests. It was observed that DLs have to provide information on cover image, contents, usage history and pictures within the books so that the selection process can be productive. Such information is a key to the success of the DL system.

McKay et al. (2012a) have demonstrated that the interface of the books plays a vital role in book selection, from cover to searching options. The researchers examined elements common to books that were instantly explored or rejected. They also found that the interface design of the book is very likely to affect book selection. Furthermore, McKay et al. observed that the bibliographic data seems to affect the information behaviour of the user. For example, the number of pages and the Library of Congress code. The study further indicated that because the cover elements play an effective part in book selection, it is important to remove of inconsistencies, so that the desired pattern of interaction with books can be encouraged.

In another study, McKay (2011b) investigated digital library users' preferences in the information-seeking process. She observed that it seemed much easier for users to utilise Google to locate library sources than to use complicated digital sources. The study revealed that most users begin a search by using Wikipedia and/or Google for less authoritative sources. After some time, users then search for more authoritative sources; but when conducting online searches, users generally rely on chance, as they cannot scan the options in the same manner as in the physical library.

McKay et al (2011a) also investigated how patrons use eBooks in academic libraries. The study investigated the in-book navigation, raw use and document triage practices. This study referred to several scholars who had examined the behaviour of users' interaction with digital systems via a transaction methodology

of log analysis. The interaction with online systems includes library catalogues, search engines, digital library sources and DLs. The data gathered demonstrates that reading and browsing behaviour is different when fewer pages are viewed, with pages read more sequentially. Although there is difference in the way users interact with scholarly work (articles) and books, the attitude is the same towards both materials. For example, consumers flip pages more often, use the structure of the document for navigational purposes and read pages backwards. In both situations, readers begin reading from the start, and continue by flipping pages. However, browsing attitudes are different from reading behaviour. This study also explained that readers' behaviour towards using an eBook for academic purposes and reading scholarly articles is similar.

McKay et al (2004) explored the use of two types of classifiers for browsing Greenstone Digital Library, analysing issues a user is likely to face when searching online, and how the problems can be removed to satisfy customers. They recommended three approaches: (1) a self-organising, map-based browsing facility; (2) a browsing system based on search; and (3) the addition of a thesaurus in Greenstone's browsing and searching system. The new system enables consumers to 'combine browsing and searching in keeping with both the literature on information-seeking behaviour and the user experiments carried out as a part of the work done for this investigation' (McKay et al., 2004, p. 294). If such enhancements are added to the system, consumers will have more flexible options for browsing digital data. These supports for search are specific to digital libraries, and no similar support exists for physical libraries.

### **2.3 Collaborative searching in physical and digital libraries**

*Collective information-seeking* is a set of activities that a group of patrons may use for making decisions about books or allocated resources (Rouse & Rouse, 1984). Users of physical bookshops and libraries have an advantage that users of DLs do not have: physical environments allow for group collaboration. Collective information seeking in physical environments refers to many users visiting a library at the same time, using research material collectively.

We found that studies typically took one of two approaches in identifying information seekers. Some presented seekers of information as individuals (Brown, 1991), while others emphasised the cooperation between information seekers (McDonald & Ackerman, 1998; Koschmann & Stahl, 1998; Twidale & Nichols, 1998). Collective searching does not only focus on information sharing, but also includes actions such as informal seeking, consulting, peer influence and the use of others' (Talja, 2002). Talja considers collaborative and collective seeking as natural processes and to be as common as individual seeking.

There has been research on the development of DLs, in order to satisfy the needs of group users. Providing a collective sharing forum may be the most effective way of commencing group collaboration in DLs, where users have the ability to open direct communication with each other, help each other and provide support for the searching process (Renda & Straccia, 2005). Further, users can benefit from each other's suggestions and recommendations on how to narrow and refine a search. The comments and feedback of others can enable users to work together, as if in a group. Pearson et al. (2012) suggested diverse forms of collective group reading, such as reading in different places at the same time, reading for performance, recitation or reading individually in the context of a big group task. They indicate that:

“Most of the group members pre-read material, but in every group reading, at least one member had not pre-read the material. In either of the groups, the unprepared readers were not consistently the same person. The texts were, nonetheless had typically already been read by half or more of the reading group. This contrasted with the library groups, where most group members, and on approximately half the occasions, all, had apparently not encountered the text before”. (Pearson et al. 2012)

Location in a physical bookshop or library gives users the opportunity to interact or collaborate with others. When users search libraries by working in groups, the search processes may potentially become quicker and simpler, and yield better results. The same applies to bookshops. The recommendations and references of peers, teachers and librarians can save time, by narrowing searches

for resource material. In an earlier study, we observe that library searches are usually elaborate, to the extent that users prefer to search collaboratively (Alqurashi, 2013). Further, group members conduct searches by dividing tasks between them. For example, it was noticed in one group that one member physically removed books from the shelf, another undertook a catalogue search, and others browsed the books. Users in the same group exchanged information by communicating, especially asking for feedback. We concluded that when patrons visit a bookstore it becomes a social experience for them, because the time they spend talking and socialising is greater than that spent searching for books. At times, users were certain of the location of the books they were looking for, while at others they wandered around looking at other reading material.

## **2.4 Social interaction in physical libraries**

Griffis and Johnson (2013) stressed the importance of investigating other uses of libraries to increase their relevance to society and ability to meet their users' needs. Creating a place for people to meet and interact may be beneficial in building a social environment and change people's perspective of public libraries as a place for only storing resources and information.

Leckie and Hopkins (2002) also indicated that public libraries can be a place for informal social interactions to occur, as community members of different ages and from different ethnic and economic backgrounds can meet, interact and work together for the good of their communities. Furthermore, Vårheim (2009) found that public libraries can serve as social meeting places, as well as places of information. They also contribute to building trust among people, through the learning process, which can create trust in people (Audunson et al., 2007; Vårheim, 2007b; Vårheim et al., 2008). Comprehending the role of libraries within the community, and considering the public library as a physical place of information as well as a social place, can be advantageous to meeting their users' needs (Karen, 2007). Karen identified that while librarians have been aware of the social functions that libraries can play, the mission statements of most public libraries focus on educating the public and do not acknowledge the social aspects.

The use of physical space in academic and public libraries has been a topic of debate among researchers. For example, they have questioned the way library

buildings are designed (Bryant et al., 2009). Comparisons of social and communal activities in academic libraries have also been undertaken (Ross et al., 2009). Ross et al.'s study found that traditional *communal* academic libraries are not the same as *social* academic libraries (i.e., those that provide additional spaces for social interaction). The social model envisions libraries in which students work simultaneously, communicate and collaborate with each other, to exchange knowledge. They found that adding social services and functions, such as information commons, cafés, and group study facilities or art galleries, creates spaces that invite cooperative work. Gayton (2008) discussed whether non-traditional library services—such as information commons, social spaces and cafés—are adding to or detracting from the communal spirit of academic libraries.

Traditional academic libraries are not only book warehouses, but also a social place for people to interact and exchange knowledge. However, Freeman (2005) argued that academic libraries were never designed with user aesthetics in mind, having ‘been designed first and foremost as places to collect, access, and preserve print collections’. Ross et al. (2008) introduced the notion that the traditional academic library is dying. They also observed that some academic libraries were redesigned to respond to the changing circumstances by installing social spaces such as cafés, theatres and museums, or by developing information commons and cooperative group study spaces. These different responses to the problems facing academic libraries are rooted in the idea that academic libraries are not just storage facilities. Restricting academic libraries to this purpose could lead patrons to rely too heavily on electronic resources, due to their constant accessibility, which may indeed lead to the death of the academic library as it currently exists.

We believe the development of new, innovative models of the academic library may be justified. Historically, academic libraries were not only places offering intellectual resources, but also places that offered a space for those resources to be seriously discussed. The rise in DLs could make academic libraries dispensable, as patrons would not have to enter them to access resources. However, many people still visit them anyway, to enjoy the social experience of meeting and interacting with other people engaged in similar studious activities.

## **2.5 Social interaction in DLs**

In our earlier study, we observed that social interaction is instrumental in browsing and searching for books, whether in a bookstore, library or DL (Alqurashi, 2013). Group collaboration was found to be efficient when searching for books in physical bookshops and libraries. Communication and exchange of material helped patrons divide their search and gain access to detailed information. Varied groups interact while searching in bookshops and libraries. The mode of accessing material through DLs is increasing at an unprecedented rate, due to the fact that DLs offer unlimited access with continuous availability at minimal cost.

The lack of interaction and inability to exchange data is considered the largest limitation of DLs. This could be resolved by developing tags and pointers, discussion and chat windows to enable users to comment and receive feedback about books and resource materials. Social interaction would make the browsing experience easier, and will encourage more users to use DLs. Including graphics and annotations, as well as generating more vocabulary instructions could further improve DLs and satisfy users' needs (Cunningham et al, 2013).

The building of a digital library should be studied carefully, in order not to eliminate the indispensable features of physical libraries. Many proposals for DLs remove interaction and social exchange, focusing narrowly on technical mechanisms of information search and access. This is unnecessary, as efficacious mechanisms for interaction and social exchange within the system could be provided. The social world should not be removed from these systems (Acherman, 1994), as this enables a sense of community, which should not be lost. Social mechanisms are useful in information access.

## **2.6 Summary**

The previous sections present a brief discussion of related work that focused on information seeking behaviour in both physical and electronic libraries. In Table 1, some interesting findings are summarised in order to highlight the information gaps in these reviews that indicate areas in which further study is required. Six main discussion categories can be identified from some of the related work



1. Book interaction behaviour: factors and features that influence patron's decision about books (e.g., book covers, sampling, and title).
2. Searching/ browsing behaviour: serendipitous discovery and browsing through the bookshelves in order to compare between books.
3. Collaborative interaction: any sort of activities accrued between patrons such as group reading or search together.
4. The use of library space: use library services and facilities and the whole discussion of the way that libraries should be designed.
5. Social interaction: activities that are not related to books (e.g., library as third place, chatting and spending time in the library and so on).
6. Information seeking behaviour: "the ways individuals seek, evaluate, select, and use information" (Wilson, 2000).

The study	Library Types				Methodology					Observed sample		Focus points					
	Physical				Observation and record video	Observation	Interview and observation	Interview	survey	Groups	Individual	Book searching behaviour	Searching/browsing behaviour	Collaborative interaction	The use of library space	Social interaction	Information seeking behaviour
	Academic libraries	School libraries	Bookshops	Public Libraries													
Timpany et al. (2012)	x					x				x							
Gayton (2008)	x								x	x							x
Ross et al. (2008)	x								x								x
Bryant et al.,( 2009)	x								x	x							x
McKay (2012b)	x				x	x				x	x						
Hinze et al. (2012)	x							x			x	x					
Reutzel and Gali (1998).		x				x					x	x					
Moore (1995),		x				x		x			x	x					
Buchanan and McKay (2011)			x		x	x					x		x				
Cunningham et al. (2013)			x			x					x						x
McKay et al. (2012a)					x	x					x	x					
Leckie and Hopkins (2002)				x					x								x
Vårheim (2009)				x					x								x
Brand-Gruwel et al. (2005)					x	x											x
McKay (2011b)					x	x					x						x
McKay (2011a)					x	x					x						x
McKay et al.(2004)					x	x					x						x
Talja, (2002)					x				x				x				
Renda & Straccia, (2005)					x								x				
Pearson et al. (2012)					x	x					x			x			

Table 1: Summarizes the main findings of the related works (x means support for feature, empty cell means no support)

From Table 1 we can see that book selection behaviour has been widely considered and discussed in different environments, including bookshops and public, academic or school libraries. Our discussion of these papers in the previous sections has highlighted that these studies have focused on a number of aspects, such as selection strategies, physical attributes and features that can

influence book decisions, browsing and searching interaction between patrons and bookshelves. However, we note that most of them focused on individuals rather than group's patrons.

Only two studies in physical environments observed groups: Timpany et al. (2012) aimed at observing groups in academic libraries (but most of these were in fact pairs of patrons), and Cunningham et al. (2013) observed group of patrons in bookshops and public libraries. All studies that discussed physical libraries and bookshops seemed to have specific target types of patrons (such as students, children, or teachers). Cunningham et al, (2013) observed collaborative interaction between patrons in bookshops and looked to the possible implications for digital environments. This is somewhat similar to what we are aiming to achieve in our research. However, we focus on public and academic libraries and try to address different aspects of collaborative and social interaction between patrons in both environments, while noting the specific group structures (e.g., families or groups of equal peers). Pearson et al. (2012) focused on collaborative group reading in a digital environment and emphasised that group collaboration are not supported in DLs.

When we turn to digital libraries and eBooks, most of the studies we discussed focused on Information-seeking needs, information-seeking behaviour and book searching process. They addressed some common approaches used by digital users and indicated searching and browsing patterns followed by users. They were mostly looking for possible enhancement and development in new browsing systems that support the information-seekers and their unlimited communication. Moreover, all but one focused on *individual* users.

This Master's thesis addresses the gaps identified in the literature. We will investigate more about the *collaborative social and book interaction behaviour within groups of patrons* in public and academic libraries acknowledging group compositions (e.g., parents with children, family groups, or groups of peers). We will observe the communication between the patrons in a group and the interactions of patrons with bookshelves. We hope that this will provide us with an overview of information seeking behaviour in groups, which may assist in developing new ideas about possible implications for digital libraries.

## **Chapter 3: Methodology**

### **3.1 Introduction**

This chapter outlines the methodology and procedures of the study. It details how the data was collected, the strategies chosen, the sample for the study, and how the data was analysed and evaluated to answer the research questions.

### **3.2 Using a qualitative method**

Creswell (2009, p. 4) defines *qualitative research* as “a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem.” Our study uses qualitative methods to observe participants in libraries and to analyse the observation data. In an earlier study (Hinze et al., 2012), patrons were only observed briefly (for about two to three minutes), and then interviewed by the researcher. The interviews offered patrons the opportunity to summarise their search and browsing behaviours from the unobserved portion of their library visit. In this thesis we observed anonymous participants over longer periods, from their entrance to the library until the time they left. The lengthier observations allowed deeper investigation of patrons’ interactions, approaches and book selection behaviour, or, sometimes, their decision to leave the library without a book.

A qualitative research method was considered appropriate for investigating the experience of group patrons’ interaction within public and academic libraries. This observation can help us obtain answers for the study’s research questions. The lengthier observations enable investigation of the patrons’ interaction, as well as their approach and book selection behaviour, or, alternatively, their decision to leave the library without a book.

### **3.3 Data collection procedure**

The study was conducted at one university library and two public libraries, all located in Hamilton, New Zealand. Selecting groups of two or more patrons was the only criterion for the observation. All browsers’ activities within the libraries were recorded, such as interaction with bookshelves, in both the fiction and non-fiction sections, and social communication between group members and other

browsers. Participants were of different ages, but no unsupervised children were observed. Each of the observations was done by one researcher who also took manual notes. All observations used here were done by two researchers (Laura Phillips and Hayat Alqurashi), one of whom is the author of this Master's thesis. All data was coded by the author and analysed in an Excel spread sheet. The observation took place both on weekends and working days, in the mornings, afternoons and evenings. We created a classification scheme according to Glaser et al.'s (1967) grounded theory analysis.

Because of time constraints, and because not very many groups seemed to frequent the academic library when we did our observations, we observed twelve groups at the Waikato University Library and then decided to additionally analyse a subset of a sample of participants observed previously in the same library: two groups from March 2013 and five groups from December 2012, so the total was 17 groups. In the public libraries, 42 groups were observed by Hayat and 24 by Laura, totalling 66 groups. More details on this will be discussed in Section 3.4.

### **3.3.1 Strategies for participant selection**

As previously mentioned, the only criteria for the observation was the selection of groups of two or more patrons. Typically, there was diversity in group age and the use of the physical environment, as the study focused on two different types of libraries. Thus, the first phase of the research process was to identify the characteristics of participants, which divided into two age groups:

- Adult and children in public libraries;
- Only adults in academic libraries.

In terms of the use of physical space, different activities were observed in public libraries, such as using the Internet, conducting meetings and participating in children's events. However, in the academic library, browsing shelves and using the online catalogue were the only observed activities. In the public libraries it was hard to determine whether patrons would interact with the bookshelves after using library facilities, so they were followed until they left. In the academic library it was an easier to observe whether participants wished to interact with the bookshelves or not.

### **3.3.2 Data analysis procedures**

The data was coded and analysed after the data collection period. The researcher aimed to identify behaviour patterns. The data analysis procedure was guided by the method outlined in Glaser et al. (1967). The analysis of the data underwent several steps:

1. The first step was to give each participant an alphanumeric ID, in which the first letter was the first letter of the observer's name, and the number a running number through all observed patrons. For example, H17 meant that the number 17 was allocated to a patron observed by the researcher Hayat, hence the letter 'H'. Patrons observed in the public libraries were additionally labelled by the letter "p" and patrons in the academic library received an addition "a". This way we can identify that Hp17 was being observed by Hayat, and located in one of the public libraries.
2. The second step was the organisation and preparation of the data for analysis. Every group was examined, and transcripts were prepared of the interactions between group members within the libraries.
3. The third step involved the analysis of the textual data with a coding process. All data was then read through to make general sense of the information, and to create initial categories or themes for analysis.
4. The fourth step was to use the coding process, generate a description and produce graphs and tables to gather the data in a readable manner.
5. The fifth step was to decide upon ways to 'advance how the tables and graphs will be represented in the qualitative narrative' (Creswell, 2009, p. 189), and discuss themes and quotations from the data.
6. The final step was to interpret the data, to determine whether the findings of the study confirmed previous information or diverged from it.

### **3.4 Participants details**

Eighty-three groups in total were observed, 66 in the public libraries, and 17 in the academic library (see Figure 1). Overall, 180 visitors in public library were observed—57 women, 41 men, 44 girls, and 38 boys. The groups comprised of 12 groups of only female patrons, 46 groups of male and female patrons, and eight groups of only male patrons. Group size ranged from two to ten (43 groups of

two, 13 of three, five of four, two of five, one of six, one of seven and one of ten). Fifty-six groups consisted of adults and children, and ten groups were adults only.

In the academic library, 17 groups were observed, totalling 37 people (23 females, 14 males). These groups comprised of seven groups of female patrons, six groups of male and female patrons, and four groups of male patrons. Group size ranged from two to four (15 in groups of two, one of three and one of four).

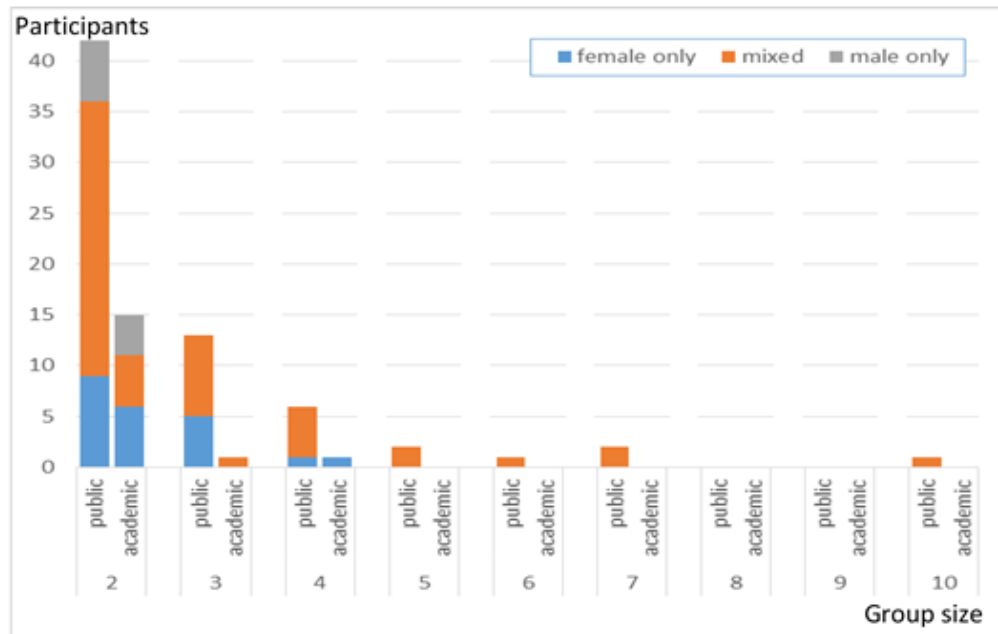


Figure 1: Group size in library observation

The estimated age of observed patrons in the academic library ranged from 20 to 27 (see Figure 2). All were students at undergraduate or graduate level. In public libraries, most participants were aged 30 to 40. The second highest age group was between 40 and 50. It was found that the ratio of participants in the age groups of 50 to 60, 60 to 70 and 70 to 80 was low, compared to other age groups. Participants in the age group 20 to 30 were comparatively higher in their visits to public libraries.

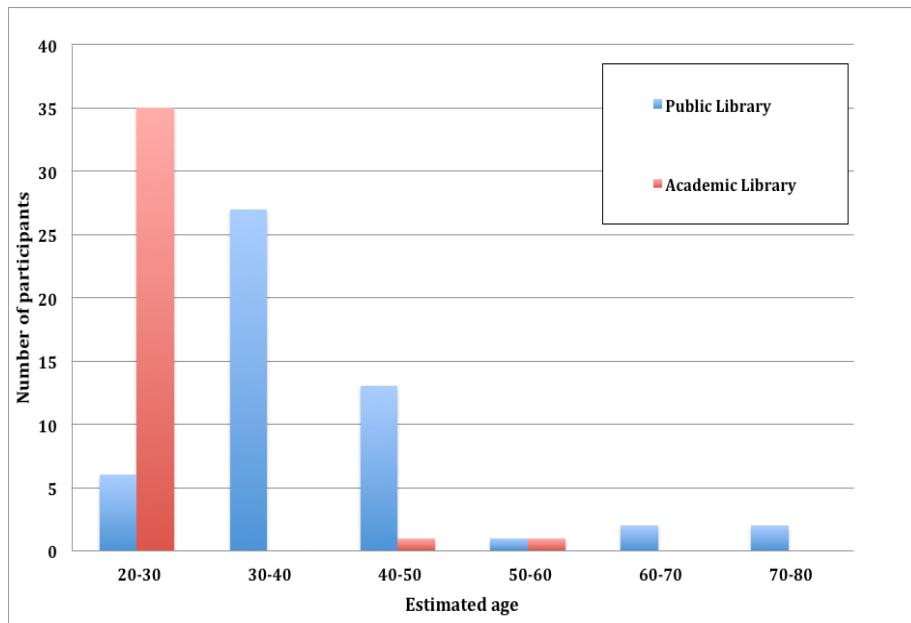


Figure 2: Estimated age of observed adults

Public libraries are considered a social place, so a number of children were observed. The estimated age of the children observed (in the public library only) is shown in Figure 3

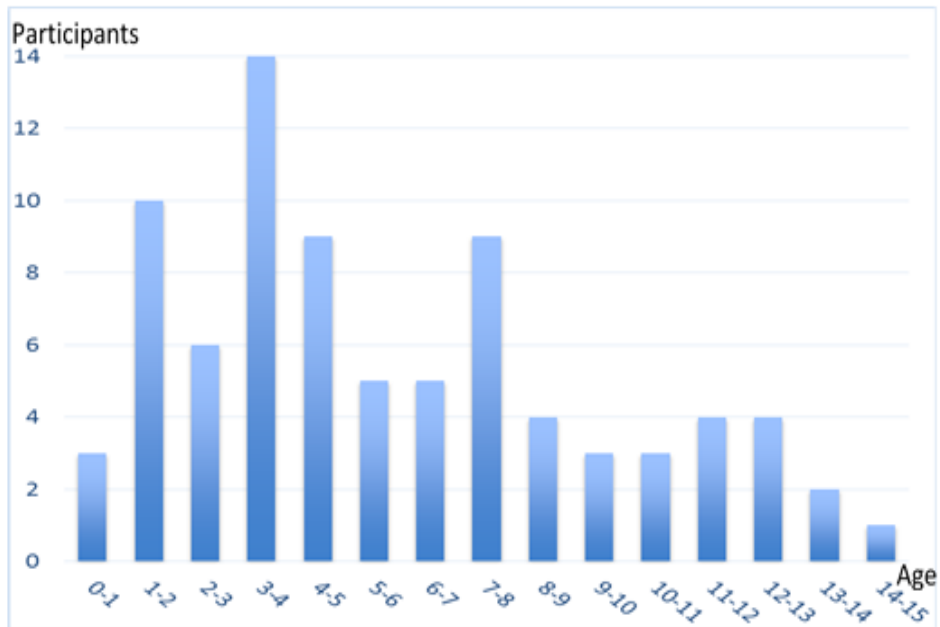


Figure 3: Estimated age of observed children

We observed more female patrons than males in both the public and academic libraries. This reflected on the patrons visiting the libraries at the time, and does not indicate a preference by the researchers. A total of 101 female visitors (adults and children) and 81 male visitors (adults and children) browsed the public libraries, and 23 female and 14 male visitors browsed the academic library. The groups with children may or may not have been families; however, for ease of readability we refer to these adult and child groups as families.

### 3.5 Duration of visits

In most cases, patrons were observed from the time they entered the library until when they left, but when this was not possible we observed groups already present in the library, and followed them to the point where they completed their visit and left (with or without books). The duration of the observations in the public libraries varied from zero to 180 minutes, with a mean of 26 minutes. The duration of the observations in the academic library varied from two to 29 minutes, with a mean of 11 minutes (see Figure 4).

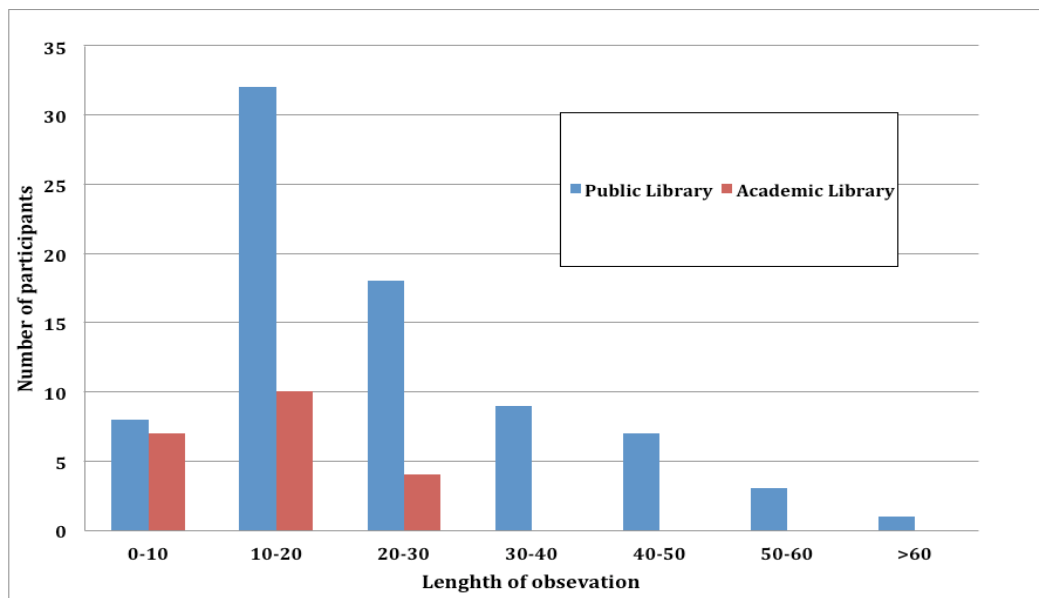


Figure 4: Length of observations (in minutes) and number of participants



### **3.6 Categories or themes of analysis**

After the observations, the data was coded using Excel. Coding method has been defined by Auerbach and Silverstein (2003) as “a procedure for organising the text of the transcripts, and discovering patterns within that organisational structure” (p. 44).

To address the study questions, data was analysed according to the narrative information collected in each type of library, meaning that in public libraries, for example, families were observed, while in the academic library all participants were adult. The data was sorted into broad themes, categories and subcategories.

#### **3.6.1 Academic library**

The researchers sought to record each patron’s movement within the group and predict the purposes behind some of their actions. It was evident from the initial observation that group members affected each other’s decisions. Highlighting the physical features and preferences that affected users’ final decisions about books helped us to understand their selection behaviour. To identify the social interactions between groups in physical libraries, we categorised the narrative information into five classifications:

- Action: group patrons collaborated to explore the shelves and select useful information resources, simplifying the decision-making process. A variety of actions was observed between groups, such as reading aloud, showing/ pointing at books or content, talking about books, looking over shoulders, pointing to shelved items, texting/talking to someone on the phone, discussing books, reading together, questioning progress, reporting activities, reading together, searching together and chatting.
- Purposes: readers’ approaches in a physical library typically depend on the purpose behind their visit. We determined five purposes: company and assistance, looking for a particular book, looking for a useful book on a specific topic, spending time together and sharing experiences and knowledge.
- Book decisions: information used for book decisions, such as title and spine, cover, and flipping through.

- Share tasks: this involved search strategies among individuals within the group.
- Using library space for reading: this involved reading books inside the library, and using library space.

### **3.6.2 Public library**

Similar concepts have been observed in public libraries, so we used the same categories for analysing the data as that used in the academic library. However, the public libraries included mixed adults and children groups, so it was important to examine whether adults can affect children's book decisions. It was observed that family groups have different patterns when approaching bookshelves. We classified book decisions into seven categories:

- Parent offers options to child;
- Parent chooses books;
- Child chooses books;
- Requests for assistance;
- Child left alone to choose books;
- Choice based on cover;
- Child not interested in books.

The sociability of public libraries will be discussed, in terms of use of library space for meeting friends, participating in social events, spending time and casually chatting.

### **3.7 Summary**

This chapter explains the methodology used in this study and the strategies applied to participant selection. Observation was the procedure chosen to collect the data, in order to provide a space for patrons to behave normally without interference. By doing so, library users' interaction could be observed. This chapter also explains the coding and analysis process.

## Chapter 4: Results

### 4.1 Overview

This chapter presents the results of our study, structured into several areas: reasons for visiting the library for members of a group (presented in Section 4.2), book selection behaviour (Section 4.3), observed interactions between group members (Section 4.4), and each participants' activities within the library (Section 4.5). Each of the sections compares between the observed participants' behaviour patterns in academic and public libraries.

### 4.2 Reasons for visiting the library

To reason about the observed patron behaviour and in the absence of participant interviews, we tried to deduce from the observed group behaviour the reasons or motivations for their library or bookshop attendance. Based on the observed participant's actions, five main reasons were identified, which are explored subsequently:

- **Sharing experiences and knowledge:** a number of readers interacted with books, discussed information and exchanged knowledge.
- **Spending time:** participants attended physical libraries as a social environment, or a place to pass time.
- **Looking for a useful book on a specific topic:** readers searched the collection with the aim of finding potential resources on a defined topic. However, in public libraries, a further category was added: looking for useful books with no defined topic.
- **Looking for particular book:** readers visited academic and public libraries with a specific goal, which was to find a particular book.
- **Company and assisting:** readers assisted their group partners in locating a desired book on the bookshelves, or provided company for other patrons, with no defined aim behind the visit.

### 4.2.1 Academic library

Figure 5 presents a summary of our observations of the purposes or intentions of the patrons' visits for the 37 academic library patrons examined in this study. The following paragraphs describe the participant's actions according to each of these five categories, starting by the most popular one. The purpose of each visit was deduced from our observation and thus describes the overarching activity that the patrons were engaged in.

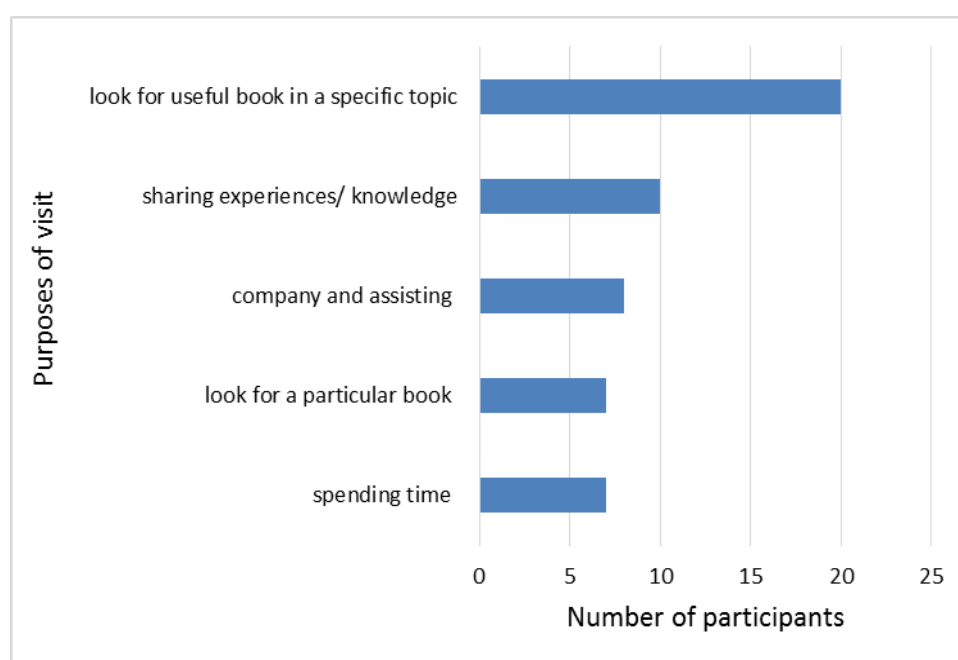


Figure 5: Purpose of visits to the academic library

#### 4.2.1.1 Looking for a useful book on a specific topic

As most academic library users are students at undergraduate or graduate level, it was unsurprising that 20 patrons out of observed 37 patrons seemed to have a specific aim for their visit, which was looking for books on a particular topic (see Figure 5). Almost 9 patrons used the online catalogue, while others went directly to the bookshelves. It appears that users had a definite task in mind, and had come in a group together to search for books related to their study or research. One group (Ha1 female and Ha2 male) is a typical example for patrons who were observed visiting the university library for the shared purpose of finding a useful book:

Ha1 and Ha2 were already searching the catalogue before the observation. They have an assignment sheet, from which

Ha1 reads aloud and Ha2 searches the catalogue. They go to the shelves, pointing out books; half pull them out, and look to the shelves from a distance. Ha1 looks to the paper and pulls book out, reads the cover and puts it back. They both look to the shelves from a distance and return to the catalogue. They read the assignment sheet together and flip the paper, talking while standing next to the catalogue. Ha2 searches the catalogue and Ha1 looks to the screen and the paper. They return to the shelves and look to the number of the section at the top. They look to the spine of the books. Ha2 pulls a book from the middle, shows it to the women. It appears that they have found what they want. They talk together, and then leave the library without any book.

#### **4.2.1.2 Sharing experience and knowledge**

Ten of the 37 participants in the academic library were observed discussing books, which we see as a form of sharing experiences and knowledge. For instance, while they explored the shelves and selected books, one patron explained information for his/her partner, although that did not always lead to selecting books. One couple (female Ha34 and male Ha35) talked, read and explained some information from a book, but left the library without selecting any books. The following describes their interactions:

Ha34 came to the library with her friend. She was sitting on the floor before the observation. Ha34 was reading some papers to Ha34 while he searched the shelves. They both discussed the books they needed. Ha34 stood up and looked to the book that Ha34 was holding and talking about. She sat on a chair and pulled the book from eye level. The book contained photos. She flipped through the book and showed Ha34, then closed it and put it on her lap. She again talked to Ha34 about his book, who read some information to her. She returned the book and picked another from the same shelf, flipping quickly from the middle. She returned it. Ha34 pulled a book from an upper shelf and read the first page,

then showed Ha34 the title. He read some information, and illustrates an idea to her, before returning the book. He moved next to her and looked to her book, then looked to the shelves and again to his friend's book. They stopped for a while and discussed the information. He moved to the shelves on the other side, took out a book and opened it from the middle, showing Ha34. He quickly flipped through the book, stopping on some pages and reading the information to Ha35. He closed the book and talked to Ha35, then opened the book again, read it and returned it to the shelf. The pair left the library without a book.

#### **4.2.1.3 Company and assistance**

For eight of the observed patrons in the academic library, the reason for visiting an academic library seemed to be to give company and assistance to another patron. Those who came for such purposes chose to either read the online catalogue notes for their partners, in order to assist them find the required books, or walked through the shelves and held books for their partner. Groups of two females (Ha26 and Ha27) were observed, one searching for books, the other walking and holding her partner's books. The following describes the observation of this pair:

Ha26 has a paper note and moves between sections. It appears that Ha27 does not want to search. She looks at her mobile. Ha26 puts her finger on books while looking to her paper note. She pulls books out, looking at the cover, and gives them to her friend to hold. She moves to different sections, looking at the note, pulling books from a lower shelf, looking to the first page, showing her friend and giving the book to her. Ha27 looks at the shelves. Ha26 pulls books from different locations, flip through them and gives them to her friend. She puts her finger on a book and pulls another from the shelf, puts it on the table, sees the first page, shows it to her friend and gives it to her. They go back to the first location. Ha26 takes a book, looks at the first page and gives

it to her friend. She looks from a distance, checking the note. She bends her neck, pulls a book from a lower shelf, opens it at the beginning, sits on the floor, looks to the index, then opens it at the middle and returns it. Ha27 sit on a chair. Ha26 pulls a book from an eye-level shelf and returns it. They both leave.

#### **4.2.1.4 Looking for a particular book**

As seen from Figure 5, seven patrons appeared to visit the library to find specific books. Although some knew exactly what they were looking for, others asked a librarian for assistance. It was not difficult to predict that a male couple (Ha5 and Ha6) visited the library looking for particular books. Although they used the online catalogue and asked for assistance, it appears that they had problems determining the location of the books.

Ha5 and Ha6 stood on one of the tables in the library, searching on their personal laptop. They had a book with them. It appeared that they searched an eBook while reading and talking together. They asked a librarian for assistance, and then went together to the catalogue. The librarian searched and talked, discussing what she was doing with them. Then they went with her to the shelves, found a book and took it. They had a note that included some book titles. They both pointed at the book in the middle. Ha5 pulled a book out and took it. Ha6 pulled a book out then returned it. He pulled a book from eye level, read the spine and returned it. Ha5 pulled a book out, flipped through it, showed his friend some pages and continued to flip pages. Ha6 pulled a book down, looked at the spine and then the cover, and took it. Ha5 pulled a book down to look at the spine, then put it back, looking at books without pulling them down. They talked while searching. Ha6 pulled another book down, showing the cover to his friend and flipping through it, pointing to some content and discussing it. Ha5 looked to the shelves, from low to high. Ha6 continued reading the same

book and look to the shelves. He sat on his knees, pulled another book down, read the cover and returned it. He repeated the action with a different book. Ha5 pulled a book down, showed it to his friend and returned it. They left the library.

#### **4.2.1.5 Spending time**

From observing patrons in the academic library we detected that the space was not only used for book searches, but also for spending time with friends and passing time between lectures. Those who came for this purpose were found that they might interact with the shelves without defined ideas. This was clear from body movements and the interactions between group members. A male couple (Ha7 and Ha8) talked in front of the online catalogue for 19 minutes, and then left the library without touching or interacting with the bookshelves.

One searched the catalogue and the other looked, but they took no notes, only talking and discussing. Ha7 looked to his mobile phone, comparing it with the online catalogue, then left the catalogue and used the mobile. He might have been searching for books on his mobile. They talked next to the catalogue and searched again. They looked to the mobile and searched again. They talked together and then left, without searching on the shelves.

#### **4.2.2 Public libraries**

Our study observed patrons in three public libraries in Hamilton: Hamilton Public Library, Garden Place Library and Hillcrest Library. Overall, 180 participants and 66 groups were observed. The observation was somewhat limited, due to the low number of group users visiting the academic library compared to the public one. Therefore, some group interactions that occur in academic libraries could have been missed. Nevertheless, patrons seemed to have similar types of reasons for visiting public libraries as they had shown for the academic library. Figure 6 summarises the main purposes for visiting the public library starting by the most popular one, and we can see similar patterns, the number of people engaging in each pattern differ from those observed in the academic library.



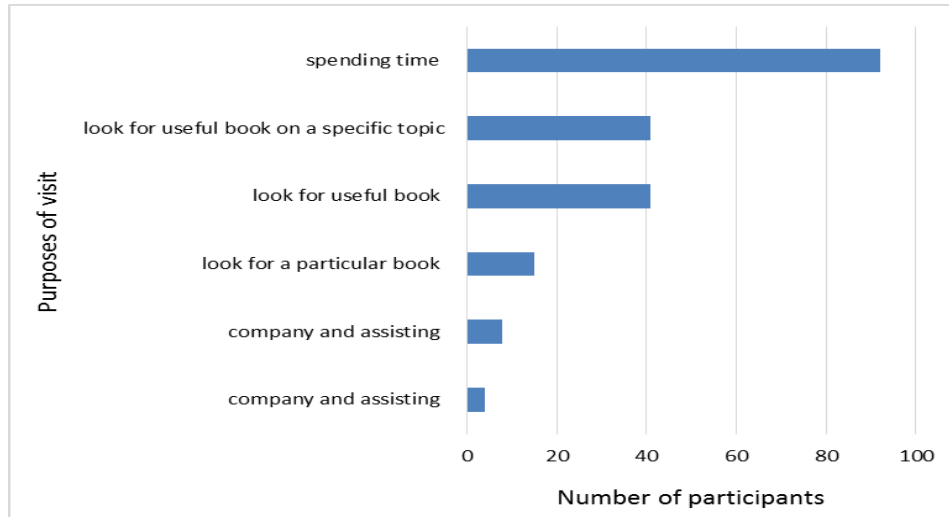


Figure 6: Purpose of visits to public libraries

#### 4.2.2.1 Spending time

Spending time together was quite an obvious purpose for 92 patrons attend the library for organised activities. A group consisting of a female (Hp39) and her son (Hp40) are the best example of this:

They enter the library and the boy asks his mum if he can play on the rocking horse. They sit at the table and play with a puzzle. The boy plays on pillows, and afterwards they both leave. They do not touch or interact with books.

Another example of patrons who visited the library for spending time and enjoy the public library experience was (Hp77, and Hp78)

Hp78 pulls book and walks then come back and pulls another one and put them on the floor, she goes to play. Mum (Hp77) pulls books flips them put them back. The girl plays with big ball. They both join the activity and listen to a story. They left the library before the activity finish with no book.

Other patrons passed time in the library waiting for a friend or an outside appointment. Hp69 and Hp70 seemed to have such purpose:

Hp69 and Hp70 entered the library together and go directly to second floor, they find a table to sit. She opens her iPad

and put her laptop on the table. Hp70 uses his mobile then they both left.

#### **4.2.2.2 Looking for useful books on a specific topic**

Forty four patrons in the public library seemed to have a defined topic in mind. They seemed to search the collections to find useful resources on a topic. During the observations, they examined shelves, cocked their heads to read book titles and authors, pulled books off the shelves and flipped pages. Finally, they made a decision about the books. The pair discussed below (female Hp31 and male Hp32) went through several steps to make their final decision about the right books, but they kept searching in one section from the time of their arrival until their departure, especially the male:

They enter the library together but each searches in a different location. Hp31 goes away to other shelves, while Hp32 searches in the 'world languages' section. He flips books in the returned items trolley. He walks, pulls book from shelves, and opens books to begin reading. While holding this book, he pulls another book from the shelf. Hp31 approaches with no books and stands next to him. Hp32 gives her the two books, flips through them and walks. Hp32 flips through a book on the shelf and does the same thing several times. He pulls a book down, shows it to Hp31, looks to the cover and takes it. They both search in same location. Hp31 looks at the covers and spines. Hp32 pulls a book down and shows it to her companion. They talk together and she takes it. Hp32 looks from the lower to upper shelves, putting his finger on the spine. Both pull books down, flip through them and return them. Hp32 looks on from a distance. Hp31 shows him the cover of one book. He takes it and goes to the first floor to talk to customer services. Hp31 sits on a chair and reads one of the books. He returns and gives her the book. He looks to the shelves and pulls

books down, spending time reading the introductions and the last page, then returning them. They leave.

#### **4.2.2.3 Looking for useful books**

41 of the 180 participants walked between different sections, viewed the shelves and selected interesting to them based on covers or whether they were bestsellers, returned items, and so on. From these actions we concluded that those users were not looking for a specific book or one on a specific topic. The following example of this group (male Hp48, female Hp49, son Hp50) illustrates the situation:

Hp48 returns books, and then both father and son go to the fiction section, pull a book out, flip through it and read some pages before returning it. The father pulls another one out, reads some pages and takes it. The boy plays around him, half pulling books out, looking to the cover and putting them back. He does the same with four books. He pulls another book down, looks at the front and back covers and takes it. Hp50 goes to the kid's section, brings a book and shows it to his dad. His dad takes it, flips through it and gives it back to him. The dad walks and sees a magazine on a table. He sits and reads some pages from it, then goes to the shelves, pulls down another magazine, flip through it and reads some pages. Hp50 goes away and comes back with a different book, shows it to his dad and says 'this is a new one', then goes to play with a girl. The dad continues to read the magazine, looks to his watch, continues reading, and then returns it. He goes to DVD section, pulls one out, looks to the shelves, then puts it back, puts his finger on the DVDs, walks, pulls out two DVDs, looks at the covers and returns them. He talks to a woman next to him. I realise afterwards that she is his wife. The boy asks his dad to go and take one CD, and then asks him to come and see the CDs. His dad goes with him, looks, then returns again to DVDs, looking from a distance and talking to his wife. The boy brings a CD and

takes it. At the same time his mum pulls out a story for the boy and takes it. They leave with three books for the father, one for the boy, two DVDs, and one book for the mother.

#### **4.2.2.4 Look for a particular book**

15 of patrons have visited public libraries looking for books in particular. They either used the catalogue to assist them or went directly to the shelves to find them. The example of Lp1 and Lp2 is describing this purpose.

They search shelves for Thomas the tank engine books. The child calls out the whole time, "I want Thomas". After searching the shelves they ask for librarian assistance. The librarian shows them the correct shelf, and then the child is left to choose books while the Lp1 goes to the adult book section.

#### **4.2.2.5 Company and assistance**

From the actions of eight readers we identified their purpose as accompanying other patrons. These patrons were either seated at a table reading magazines while their partners searched for books, or walked between shelves, flipping through books and carrying them for their partners. Hp37 (male) is an example of this kind of purpose:

They go directly to the fiction section. Hp37 pulls magazines down and sits at a table to read. Hp38 goes to the recently returned items shelves, pulls book down, looks at the covers and takes one. She walks to a different location, flips through books on the shelves without pulling them down, and keeps walking. She pulls a book down, looks at the back cover and then returns it. She pulls another one down, looks to the cover and returns it. She pulls another one down, looks at the front page and takes it, doing the same with another book. Hp37 puts the magazine back. Hp38 looks at the bestseller shelves. They leave.

#### 4.2.2.6 Sharing experience and knowledge

During our observations in the public library, we did not notice many interactions similar to those that occurred between participants in the academic library, such as sharing information and knowledge. The exception were two groups: one pair, and another group of five patrons. This does not mean that patrons of the public library are uninterested in exchanging information or experiences, but that at the time of this observation we did not witness many participants behaving in this way. Hp57 and Hp58, two male members of groups of five, are an example of this purpose:

Hp57 and Hp58 sit at a table flipping through a book about sport. The book contains many basketball players' photos. The men flip through the book, talking about their names and when they began playing. The book contains information about each player. Hp57 and Hp58 both hold the book. Hp57 reads it. Hp58 pulls the book away and reads. They point at the images. Hp57 pulls the book away to read again. Hp58 uses his mobile phone.

#### 4.2.3 Comparison of the reasons for visits to academic and public libraries

The observed participants seemed to follow one of six reasons for visiting libraries. The types of patterns we identified in public and academic libraries were similar (see Figure 7).

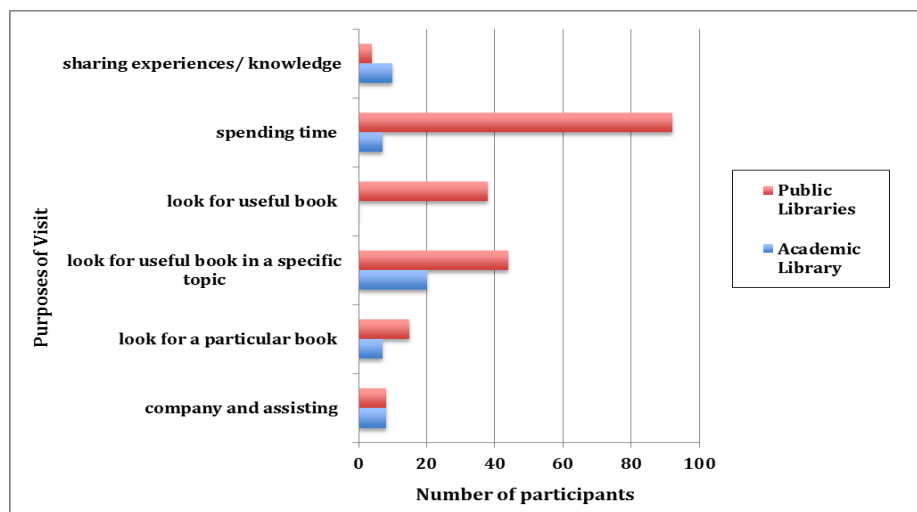


Figure 7: Purposes for visiting public and academic libraries

However, participants' priorities for visiting libraries were found to be different. For example, spending time was the most common reason for public library patrons, while looking for useful books in a specific topic was the highest reason at the academic library. Further, a number of participants in the public libraries walked between different sections, flipping books and looking for interesting books. Conversely, most academic library patrons were either looking for particular books, or for books useful for a defined topics.

### **4.3 Action/interaction between group members**

We aimed to observe patrons' selection techniques and strategies in order to understand how they treat member of the group other while interacting with bookshelves and selecting books. Group patrons were found to collaborate to explore the shelves and select useful information resources, potentially simplifying the decision-making process. We used the same list of activities as Cunningham et al. (2013) to classify the observed behaviour. These distinguished several aspects of interactions, including patrons reading aloud to each other, showing book content, talking about books, looking over each other's shoulders, pointing to shelved items, texting or talking to someone on their telephones, questioning progress, discussing activities, reading and searching together and chatting.

We observed that participant of different groups behaved differently – i.e., not all group dynamic were the same. Some patrons preferred to search independently of other members of the group, while others checked every movement with their peers, e.g., by showing books they found. Showing books or content to each other, discussing books, reading and searching together and chatting were some of the actions observed. As a result of their collaboration, readers in several cases appeared to make decisions about books together. From the captured narratives, we aimed to identify whether there were similarities or differences between individuals' interactions within groups in the academic and public libraries. Moreover, we sought to determine if and how the physical environment affected participants' actions. It is important to mention that the number of observed

participants in the public library was greater than the number observed in the Waikato University Library, as reported earlier, which might somewhat skew the results.

### 4.3.1 Academic library

The type of interactions between patrons in the academic library is best described through the term ‘group collaboration’. Talking about books, searching together, pointing to shelved items, showing/pointing to book content and reporting what they are doing within the groups were the most recorded interaction activities in our observations, illustrating how patrons search collaboratively in front of bookshelves (see Figure 8).

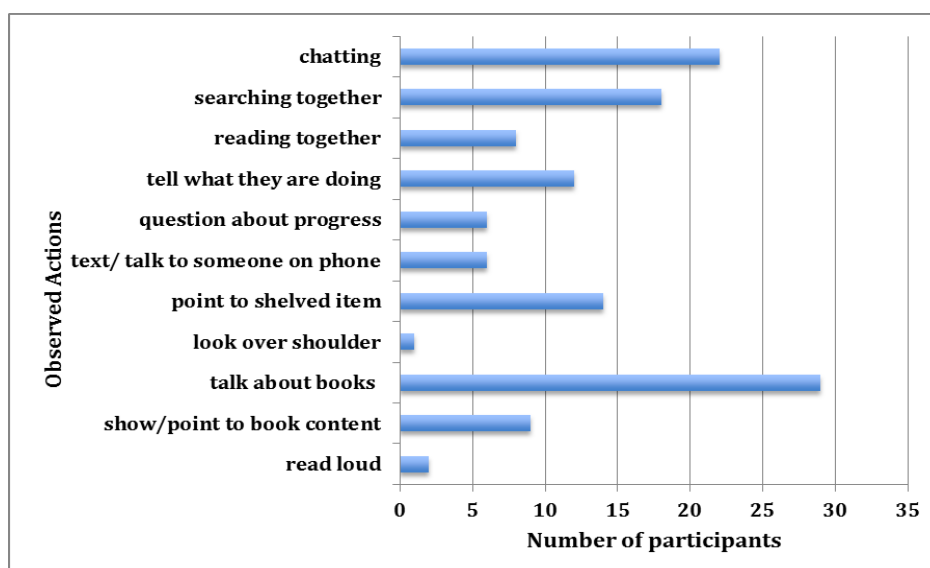


Figure 8: Interaction in patron groups

Twenty-nine out of 37 patrons talked about information related to the books. For instance, Ha1 and Ha2 walked between the online catalogue and the bookshelves several times, holding an assignment sheet. They were discussing available books that could assist them with their research (see Section 4.2.1.1). 18 patrons searched together side-by-side, eight read together while searching. Further, 14 patrons pointed to shelved items as a way of checking the spine of the book, or showing the books to their partners. Other interaction activities—such as looking over each other’s shoulders, texting or talking to someone on a telephone

and questioning progress—were observed between group members, although the observed group in the academic library was small.

Although library users’ activities appeared related to books more than social interaction, they indulged in casual talk and discussed things other than books. Ha24 and Ha25 were two participants from a group of four who attended the library after Ha22 and Ha23 had finished searching. They stood next to the shelves and talked for some time before leaving:

Each patron searched in a different location. Ha22 moves to her friend’s section. Ha23 walks and looks at shelves, and sits on the floor. Ha22 sits next to her and pulls out three books, taking them without flipping through or opening them. They leave and return with two other girls, Ha24 and Ha25. They all go to the same section. Ha22 shows one of the girls the cover of the books. They talk in front of the shelves for some time, then leave

#### 4.3.2 Public libraries

Figure 9 illustrates the most common actions undertaken by patrons in public libraries. 82 out of 180 participants searched and browsed bookshelves side by side.

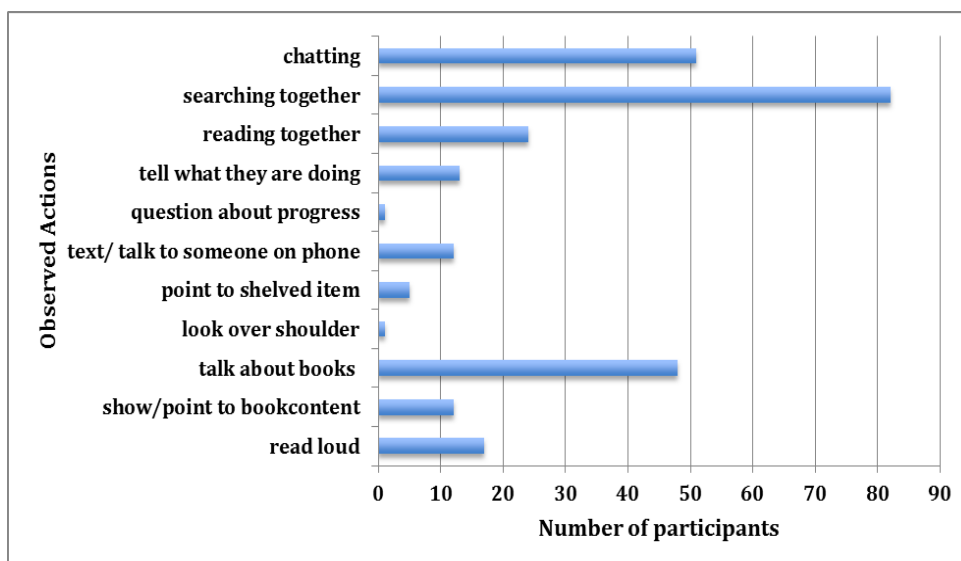


Figure 9: Interaction in patron groups in public libraries



This could be because of the sociability of the environment: participants consider the public library a place for gathering and spending time together. The next most commonly observed activity was that of the 51 patrons, who spent time chatting with the group or with other visitors about life, children and food. For example, the couple (Hp24 female, Hp25 male) participated in children's activities and conversed with other parents:

The mother goes directly to the CD shelves and gets three CDs. They all join the event and participate with other families, especially Hp24, who talks to another women next to her about their children. Hp25 also talks with different women, while the girl plays around. Hp25 uses the computer for some time. Hp24 goes to the returns box and drops some books inside. The same woman with a boy talks to them, and they all leave together while talking.

Forty-eight patrons conversed about books, including the content, the authors, images or related ideas. Additionally, there were several interactions that repeatedly occurred among users within the group, including showing book content, looking over each other's shoulders, pointing to shelved items, texting or talking to someone on a telephone, questioning progress, talking about activities, reading together and reading aloud to each other, especially parents who sit on the sofa reading stories to their children. The following example discusses Hp87 and Hp88:

They are sitting on the sofa. Hp87 reads and the girl listens. Hp87 finishes reading and asks the girl if she wants to choose another. The girl chooses one, looks to the cover and gives it to her mum to read. She finishes and places the book next to another on the sofa, and asks the girl to bring another story. The girl brings one, the mother reads but this time the girl plays around. Hp87 continues reading. She finishes it and the girl goes to choose another book. She is very excited about the cover of the book, but the mother says: 'it's too long, go and bring a different one!' The girl chooses another, gives it to her mother, who gets a call and says: 'we have to

leave now, we can only read one book.’ She starts to read and the girl plays on the pillows. She finishes the story, puts it next to another book on the sofa and leaves.

### 4.3.3 Comparison of group activities in academic and public libraries

Most of the commonly observed interactions between groups members were the same in both types of libraries (see Figure 9). For example, the three most observed actions between participants were chatting, searching together and talking about books. The reason for higher numbers to be observed for the activities in the public libraries than the academic library is that we observed more groups in the public libraries. Reading aloud was reported in public libraries (particularly by families) much more often than in academic libraries. Conversely, pointing to shelved items and questioning progress were observed more in the academic library more (see Figure 10).

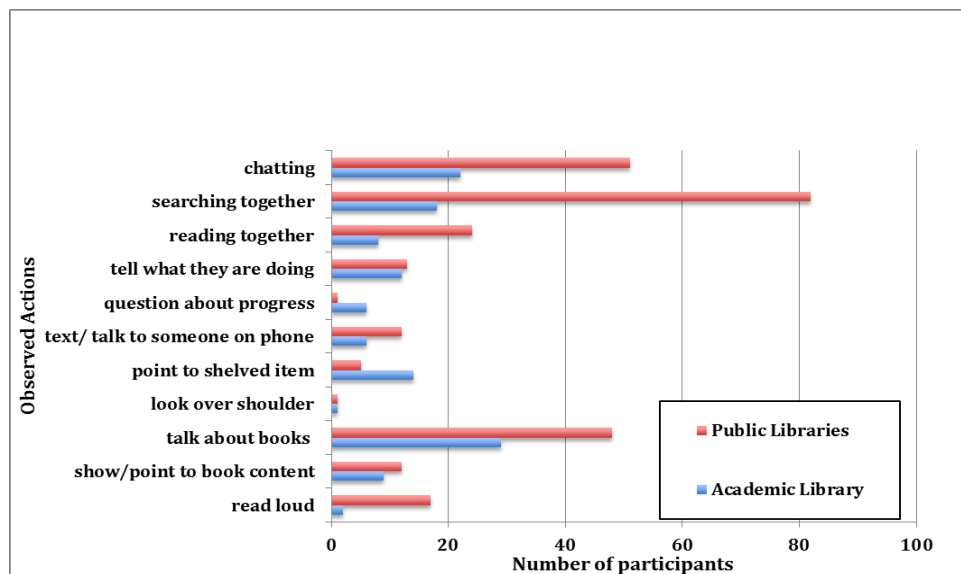


Figure 10: Interaction in patron groups in public and academic libraries

## 4.4 Actions performed by each participant

As book selection behaviour in libraries can differ between individuals, Hinze et al. (2012) have compared the book selection behaviour of people in the same group. Thus, we also aimed to observe how participants divided their tasks to achieve their objectives. Individuals within the group divided tasks as a type of search strategy to access information and locate the required books. Sometimes it was easy to identify such strategies in our observations, especially in the academic

library, but in other cases we had to make assumptions based on what could be observed from the participants' approach. During the selection process, participants appeared to attempt to either search independently or collectively. This section will specify any special sharing tasks between group patrons in both types of libraries.

#### **4.4.1 Academic library**

Six different search approaches were identified as used by readers in the academic library (we will discuss each of these in turn subsequently):

- One patron searches the online catalogue while the other watches;
- One patron searches the online catalogue while the other writes notes and reads them during the search;
- One patron holds an online catalogue while the other patron searches;
- One patron finishes his/her tasks then assists the other patron;
- One patron looks at eye- and upper-level shelves, while the other patron looks at lower level shelves.

The results for each of these are discussed below.

##### **4.4.1.1 One patron searches the online catalogue while the other watches**

Collaborating with a group in the library can be beneficial. There is no need for everyone to undertake the same task at the same time. Eleven groups out of 17 used the same technique: one patron searched the online catalogue while the other watched. They either discussed books or searched silently:

Ha7 searches the catalogue and Ha8 looks. They do not take any notes, only talk and discuss. Ha7 looks to her mobile phone and compares it with the online catalogue, then leaves the catalogue and uses the mobile phone. She appears to search on her mobile phone. They talk next to the catalogue and search again. They look to the mobile phone and search again, talking together and then leaving without searching the shelves.

#### **4.4.1.2 One patron searches the online catalogue while the other writes notes and reads them during the search**

Participants who searched the online catalogue used different techniques. Four groups out of 17 decided to perform in the following manner: one patron searched the online catalogue and talked to his/her partner, while the other wrote notes and read them while interacting with bookshelves. The example of Ha14 and Ha15 describes this technique:

Ha14 and Ha15 use the online catalogue. Ha14 searches and Ha15 writes notes. They both go to the shelves. Ha14 points to books without pulling them out. Ha15 reads the notes and pulls a book out to give to her friend. Ha14 flips through it quickly and reads some pages. Ha15 pulls another book out, flips through it and returns it. They walk and look at the shelves without touching them. Ha14 reads the note while moving to a different location. They both look from a distance. Ha15 points to a book in the upper shelves and looks at book spines. Ha14 sits on the floor to browse the lower shelf. She looks at the notes and books without touching them. Ha15 flips the pages of books on the shelves, and Ha14 pulls out a book, looks at the cover and puts it back. She keeps pulling books out, flipping the pages and putting them back. They talk together while searching. Ha15 takes the notepaper and moves between shelves without touching. Ha14 stands on a chair to look at the upper shelves. Ha15 pulls out a book, flips the pages, takes it out, pulls another book down, opens it and reads some pages. Ha14 points to some content in the book and talks. Ha15 returns the book. Ha15 continues pulling out book, flipping pages and returning them. Ha14 pulls a book out, flips the pages and takes it. They continue looking at shelves at the eye and upper level and talk together. They both return to the catalogue. Ha15 searches and Ha14 writes. They then return to the same section. They walk to a different section Ha14 points to books. Ha15 looks. I lost them for some time, and

then located them again. They have five books. Ha15 puts all books on a chair and sits on the floor, pulling out books, flipping the pages and returning them.

#### **4.4.1.3 One patron holds an online catalogue while the other patron searches**

In different examples, one participant held the catalogue notes while searching the collection, and the other searched the shelves by occasionally looking at the notes. Ha36 (female) and Ha37 (male) both entered the library and used the catalogue as an assistance tool that led them to achieve their goals. They then divided the tasks between them:

Ha36 pulled out a book, looked at the cover page and put it back. She had a paper note; apparently she used an online catalogue. She pulled out another book, gave it to the boy without reading or flipping through it. She pulled out different books, flipped through them and returned them. She did the same with three different books. She looked to the shelves from low to high, pulled a book out and flipped through it, then returned it. She pulled out another book and gave it to the boy without flipping through it. Ha37 pointed at the books without pulling any out, then half pulled one out, looked at the cover page and returned it. He took the paper note from the girl, went to the online catalogue, searched it and returned to the shelves. He looked at the lower shelf, pulled out a book and held it. Then they left.

#### **4.4.1.4 One patron finished his/her tasks, and then assisted the other patron**

After selecting their books, readers in three groups out of the 17 turned to assist their partners to search the collection. During this process, patrons also found books for themselves while assisting their partners. Ha32 collaborated with his friend, looked at his online catalogue notes and found a book for himself instead of finding one for his partner:

Ha32 is one of two friends who came to the library. He went directly to the required section and walked from the beginning of the section to the end, looking at the eye level

of the shelf without touching or pulling out any books. Then he stopped and took one book out and put it in his hand, without reading or flipping through it. After, he went to talk with his friend and help him find his required books by looking at his mobile phone and searching on the shelves. During this process, he found a book for himself and took it without flipping through it. He left the library with two books.

#### **4.4.1.5 One patron looked at eye- and upper-level shelves, while the other looked at the lower level shelves**

One of the reported distribution tasks that participants used to simplify their search process was dividing bookshelves. Five observed groups out of the 17 searched in this manner: one patron searched on one or two shelf levels, and the other on different levels. For example, Ha6 sat on the floor and looked at the lower shelves, while her partner Ha7 stood and looked at the books at eye level and above.

#### **4.4.2 Public library**

Observed groups in public libraries were not only adults. As mentioned in Chapter 3, some groups also contained children. Group interaction and collaboration between adults was slightly different to that between adults and children. This section discusses the book selection process and actions performed by each participant within the groups in the public libraries.

##### **4.4.2.1 Adult with adult**

Two search activities were observed between groups of adults:

- One patron searches the online catalogue while the other watches;
- One patron finishes tasks then assists the other patron.

##### **4.4.2.2 One patron searches the online catalogue while the other watches**

Ha3 and Ha4 walked among the bookshelves and the catalogue several times. Ha4 searched the online catalogue and Ha3 looked. They talked and pointed to the screen.

Sometimes each searched independently then discussed with each other.

#### **4.4.2.3 One patron finishes tasks then assists the other patron**

They enter the library together but each searches in different locations. Hp32 searches in the 'world languages' section. He flips through a book in the returned items trolley. He walks and pulls out a book, opens it and starts to read. While holding this book, he pulls out another. Hp31 comes and stands next to him, holding a book. Hp32 gives her the two books. She flips through them and walks. Hp32 flips through books on the shelves, repeating the action many times. He pulls out a book and shows it to Hp31. He looks at the cover and takes it. They both search in the same location. Hp31 looks at the covers and spines. Hp32 pulls a book out and shows it to her. They talk together and she takes it. Hp32 looks from the lower to the upper shelves, and puts his finger on the spine. Both pull books out and flip through them, then return them. Hp32 looks on from a distance. Hp31 shows him the cover of one book. He takes it and goes to the first floor to talk to customer services. Hp31 sits on a chair and reads one of the books. He returns and gives her the book. He looks at the shelves and pulls out books. He reads the introduction and the last page and returns it. They leave.

#### **4.4.2.4 Adults with children**

In forty eight family groups, four search interactions were observed:

- Parent assists child to search the online catalogue; finds useful resources for schoolwork;
- One patron finishes tasks, then assists the other patron;
- Parent helps one child then moves to another;
- Parents give instructions and children follow.

#### **4.4.2.5 Parent assists child to search the online catalogue; finds useful resources for schoolwork**

Using an online catalogue might be a confusing task for children, so some parents assist their children. In the example below, Lp12 searched the catalogue while Lp11 held the paper for her:

Lp11 (male) and Lp112 (female) use the library catalogue to look up encyclopaedias. The child has a sheet of paper with homework instructions. After encyclopaedias are selected, the pair sit at a table to the far end of the children's book section. The parent encourages the child to use the index to look up key words. When the child encounters difficulties, finding no successful word searches, the parent suggests alternatives. The child records important facts in a workbook.

#### **4.4.2.6 One patron finishes tasks, then assists the other patron**

Participants in the public libraries were also observed performing similar actions to academic library users. One patron finished his/her task, and then assisted their partner. Hp55 is 12 years old. She selected her books, then helped her younger sister:

I was busy after I saw them. Then I met them at 11:51. Hp54 and Hp55 each had six books from the children's section. At 11:50, their mother came to the library with Hp56. She returns some books, then uses the catalogue. Hp55 helps her younger sister find books, but she did not get any. They both go to their mother while she uses the catalogue, then the girls go back to the shelves. Hp55 looks at the novels. Hp56 plays around. Hp54 walks between the DVDs and the CD shelves, looking without touching. Hp55 shows Hp56 a book, then returns it and each searches in a different location. The mother searches in the fiction section, in the recently returned items, then goes to the girls to talk to them. Hp56 comes with book, and before they leave she runs to get a book from the novels shelves. They all go to the customer service desk and then leave.



#### **4.4.2.7 Parent helps one child then moves to another**

In many cases, parents have been observed assisting their children in direct or indirect ways. Lp47, Lp48 and Lp49 are a family group. The mother tried to help the oldest child, then moved to youngest one.

The parent and the oldest child browse shelves while the youngest child runs around the library shelves, picking up any book with an interesting cover. One parent finishes helping the oldest child, then begins picking up after the youngest. The oldest child collects 10 books from the shelves by thumbing through pages and reading the back cover blurbs. The oldest then suggests books that she had previously read to the youngest child. 'Look at the Nutcracker and his moustache!' she says. While the parent looks for more books, the children play in the library and look through a tube hole in a couch, lying on their tummies on the floor.

#### **4.4.2.8 Parent gives instructions and children follow**

A form of indirect assistance that parents used was giving instructions to their children while interacting with the bookshelves. The group consisting of Lp44, Lp45 and Lp46 is an instance of such an action between participants.

The parent gets the children to use the library catalogue to search for their book names and topics. Once selections have been made, the parent gets the children to write down the library reference book numbers to find them on the shelves.

### **4.5 Book decisions**

One of the challenges that library users face is making a decision about the right book to select. Many potential factors affect the decision-making process for library users, such as the book cover, title, and spine of the book or partner advice. Regarding the similarity between the environment in public and academic libraries, participants in both locations may have different perspectives on book

selection. This section highlights points of convergence and divergence in the selection process.

#### 4.5.1 Academic library

The study revealed four main elements for selecting books: covers with flipping pages, partner advice, title and spine for online catalogue users and cover only (see Figure 11). Thirteen patrons out of 37 looked to the covers of the books, but did not choose one solely based on that, rather flipping pages backwards, forwards and from the middle. Sometimes they read some pages, then decided to select the book. The second most common selection assistance used was partner's advice. Ten participants appeared to make their final decisions after talking to each other. Phrases such as 'it looks interesting' and 'I think it is useful' were heard, especially within groups who came to search for resources for group work.

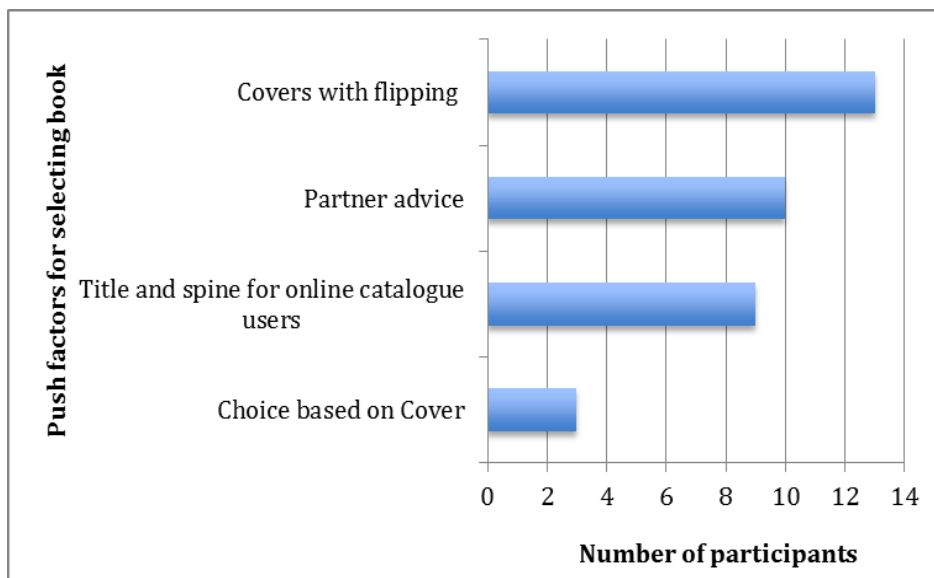


Figure 11: Book decision in the academic library

#### 4.5.2 Public libraries

In public libraries, the situation is somewhat different. 11 patrons made the decision after flipping through the books. However, in these cases it appeared that there were no determined hints for choosing resources. Patrons moved between sections, looked at bookshelves, flipped through books without pulling them out, or pulled them out and flipped through them, then either put them back or selected them (see Figure 12).

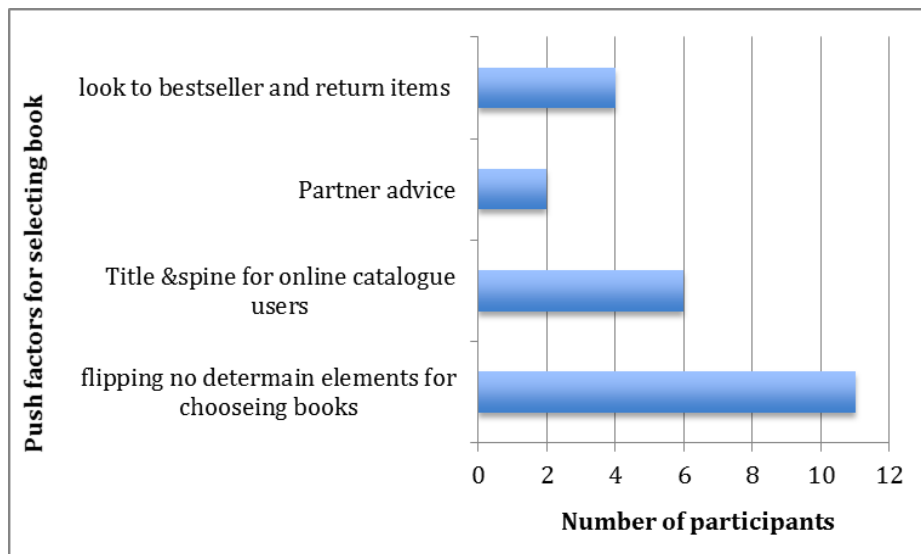


Figure 12: Book decisions in public libraries

It was difficult to determine their exact aim, or what they were looking for. Six participants who used the online catalogue relied on the title and the spine of the books to make their selections. Four patrons preferred to choose books from bestseller shelves and recently returned items section, possibly because they wanted to save time and select the more popular options. Only two participants followed their partners' suggestions.

#### 4.5.3 Public libraries (family groups)

Figure 13 reports a variety of push factors for family groups selecting books from public libraries. Seventeen children chose books for themselves; some were directed by their parents to select books that are not too hard or easy. For example, when Hp47, four years old, chose a book and showed to her mother, Hp46, she said: 'it is too hard for you'. Another mother, Hp114, asked her son, Hp115, to choose a different book because the one he chose was not for his age,

saying, ‘it is for a baby’. Conversely, four children selected their own books, CDs and DVDs and from their behaviour it appeared that they were familiar with layout of the bookshelves. Four parents chose books for their children first, then searched for their own books. This seemed to serve the purpose of amusing the children while the parent conducted their own search. Additionally, parents regularly offered suggestions and options to the children as form of an assistance. They showed them books and asked if they were interested or not in the options. Not only did parents supply options, but children did between themselves. In one instance, a girl offered an option to her youngest sister:

The parent and oldest child browse shelves while the younger child runs around the library shelves, picking up any book with an interesting cover. Once the parent has finished helping the oldest child, she begins picking up after the youngest. The oldest child collects 10 books from the shelves by thumbing through the pages and taking time to read the back blurb. She then suggests book options that she had previously read to the youngest child. ‘Look at the Nutcracker and his moustache!’ While the parent looks for more books, the children play in the library space and look through a tube hole in a couch, lying on the floor on their tummies.

Nineteen groups appeared to make their selection decisions based on the covers. This applied especially to children who were interested in images and colourful covers.

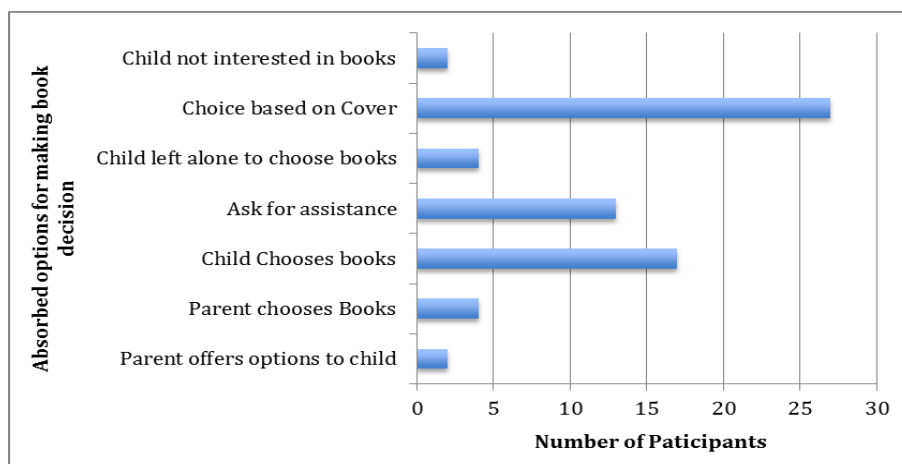


Figure 13: Book decisions in public libraries (family groups)

## 4.6 Using Library Space

Reading together is one of the collaborative activities that group participants were observed to do. 10 of 17 observed group patrons in the academic library used the floor, as most tables were far from the shelves, and couches were not available (see Figure 14). However, one group was observed reading books at a table, and another tried to find a place for them all to sit but all tables were in use. In the public libraries, almost half of the groups used the couch to read. Parents sat on the couch, reading stories aloud to their children. Other participants preferred to sit next to the bookshelves, so they were able to pull books down while sitting at tables. Sitting on the floor was the option for five of 66 family groups, especially those with very young children (one or two years old). By doing so, children were able to play with cushions, while the parents read stories and pulled books from book bins. Reading stories does not necessarily mean that books were then issued. 47 % of the groups (7/17 groups at the university library, and 52/180 at the public libraries) issued a book during their library visit, and 15 per cent of the groups issued an audio book (all at the public library, and all groups that included children).

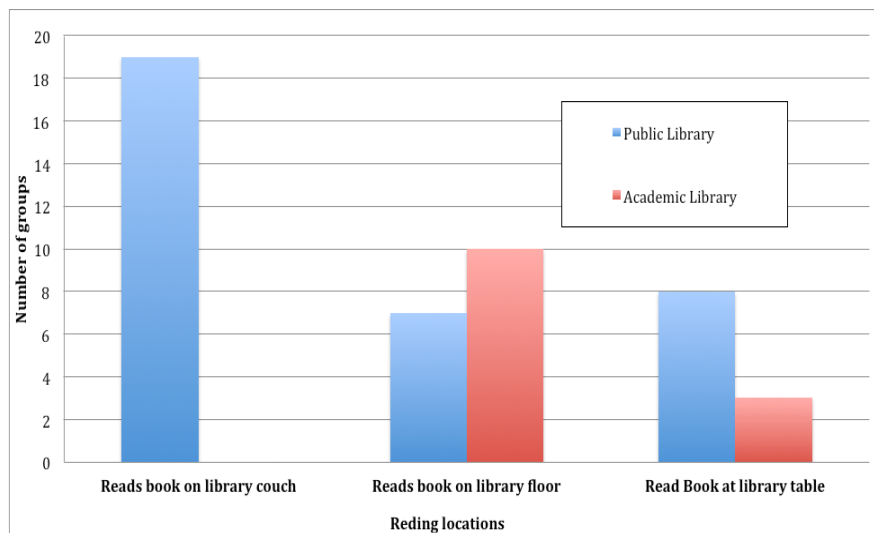


Figure 14: Use of library space

## 4.7 Summary

This section first summarises the patron behaviour during book decisions making, and then gives a brief summary about the patrons' social and search interaction with each other.

### Book decisions

Patrons in academic and public libraries have a commonality in the way they interact with each other, but such interactions differ in nature and context. In the academic library, the search process appears more thoughtful and planned. By dividing search tasks between group members at public libraries, participants do not have certain selection strategies or methodologies. Although participants in both settings have similar motivations for their visits, the priorities are different. Spending time was the most reported reason in public libraries, while in academic libraries, users looked for useful books on a specific topic. In addition to that, book decisions were made independently in some cases, and in others by requesting assistance from a librarian (mostly in an academic library), or from adults (mostly in public libraries). By looking at participants in both public and academic libraries, in fact, there are two main differences between a patron who chooses books by themselves and the other who ask for assistance in public and academic libraries.

#### 1. User chooses books

- **Public libraries:** Adults search and choose books by themselves, talking to their group members in some cases and independently in others. For family groups, 20 parents chose books for their children, while 35 children were left to choose books, with some offered suggestions from their parents. Seventeen children were left alone to select books.
- **University library:** All patrons searched by themselves independently or collectively, to select their required books. However, in two instances, patrons were looking to their partners while they searched, and they did not even touch the bookshelves.

## 2. Ask for assistance

- **Public libraries:** Fifteen patrons asked for assistance, either from their parents or from customer services.
- **Academic library:** All patrons searched bookshelves without asking for assistance. Most used the online catalogue, then consulted the shelves. One group out of 37 asked for assistance from librarians.

Figure 15 summarises the factors and features that influenced adults to make their book decision were similar in both environments. For example, adult patrons in public and academic libraries used the title and the spine of the book for making the decision. They also give advice to each other within the groups about their books selecting. However, in public libraries, adult patrons used bestseller and return items shelves, which did not exist in the academic library in the same way. Furthermore, although, adult patrons in both public and academic libraries flipped through books to make their final decision, in the public libraries adult patrons seemed not to apply specific criteria for choosing books, while in academic library they seemed to have specific criteria for their selection.

On other hand, in public libraries we observed family groups to use different selection processes especially when we talk about children. In most cases children was very interested in book covers more than any other elements. Parents also looked to the covers but they were more conscious about suitability of the book in terms of their age and level. Parents also offered suggestions for their children as a sort of assistance.

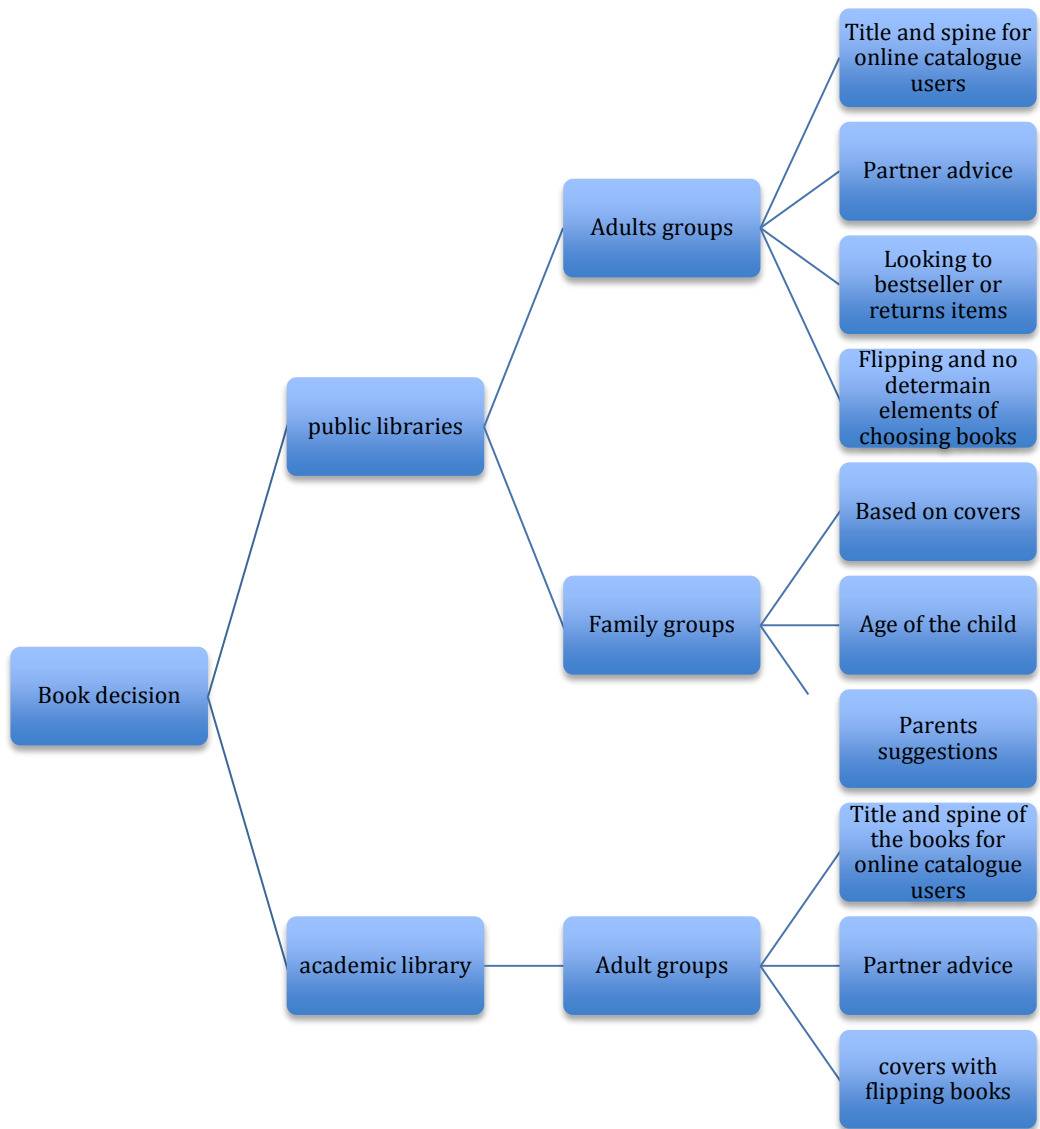


Figure 15: Analyzing book decisions in public and academic libraries



## Social and search interaction

Moreover, there are also two main differences have been noted between public and academic libraries in terms of social and search interaction behaviour between public and academic libraries.

### 1. Social interaction behaviour:

- **Public library:** Customers were involved in different social activities, such as chatting about life, culture and children. To involve children, different activities were organised by libraries, such as celebrations of the Indian festival of lights, and group stories.
- **University library:** Patrons chat about different topics. However, they always quickly return to talking about books, or information related to assignment tasks.

### 2. Search interaction behaviour:

- **Public library:** It was difficult to determine from the available data whether public library patrons had any planned search strategy between individuals of the group.
- **University library:** Sharing tasks among individuals within the group was one of the most important search strategies that university library patrons used to access information and locate the required books.

## **Chapter 5: Discussion**

### **5.1 Overview**

This chapter discusses the findings in relation to those of previous studies on this topic. It looks at some pull factors that motivate patrons to visit physical libraries (Section 5.2). Then discuss libraries as a third place focusing on the social interaction in particular (Section 5.3). After that, we talk about children in both physical and digital libraries (Section 5.4). The collaborative sharing between groups patrons will be also discussed, in which may lead to enhanced communication and social aspects in physical and digital environment (Section 5.5). Finally, we examine the possible implication for digital collaborative work (Section 5.6).

### **5.2 Pull factors for visiting physical libraries**

There seem to be several pull factors that motivate readers to visit physical libraries. Environment, familiarity, physical interaction with books and the ability to work collaboratively were all given as reasons, affecting the preference of some participants for physical bookshelves. Three main pull factors can be identified from the study:

- Environment familiarity
- Physical interaction with books
- Collaborative work ability

One commonality between users in bookstores, public and academic libraries is the more they visit libraries, the more they become used to the environment, including the locations of books, the layout of bookshelves and the other facilities. For example, students are familiar with their school libraries, making the book selection process much easier (Reutzler & Gali, 1998). In this study, some patrons visited public libraries frequently, so knew the locations of books (see Section 4.5.3). For example, Hp46 flipped through books from book bins, and said, ‘this book is in the wrong place’. Children were also observed running directly to the CD shelves, suggesting that they are familiar with the library layout. Additionally, parents move between different floors, leaving their children to play in designated areas and read books, without any concern.

In the academic library, a number of participants used the online catalogue, while others went directly to the right section without first consulting the catalogue (see Section 4.2.11). Ha31 is an example of a user who immediately went to the correct location, spending only 13 minutes selecting books. This may have been because students recognise parts of the library, enabling them to search in the correct place, saving time.

The physical environment also provides flexibility, in terms of examining and physically interacting with books, which could lead users to make accurate decisions about books. The observation indicates that 73 participants in the public libraries, and 20 in the academic library, visit with a topic in mind. They flip through books on shelves to find useful resources that might assist them to find relevant materials to their subject. Additionally, details like publisher, author and year of publication were used to make book selection decisions, which is similar to what was observed by McKay et al. (2012b). Readers in physical libraries may intensively check the conclusion, introduction, front matter and spine. McKay indicated that readers commonly make decisions based on the front matter. Although all of these details can be investigated in a digital library, some readers may still prefer holding books flipping the pages before make their selection.

Another factor about the physical library to consider is the possibility for collaborative work between groups. The findings of this study show that participants in both public and academic libraries contribute not only in the search process, but also in reading books, discussing the contents and sharing tasks, which assist decision making. Renda and Straccia (2005) found that when readers search collectively, share tasks and work in groups, the search process is quicker and simpler, with better results. This concept can be noted in academic library where students search collaboratively in order to find useful resources in such short time but in public libraries the collaboration between groups of patrons had another side which is enjoying spending time together and talking while they are searching. Two categories were identified from participants' actions, within the broad theme of collaborative interactions: book interaction and social interaction.

Furthermore, group collaboration in both types of libraries appears to be very effective, in terms of information exchange, distribution of the users' search and access of accurate information. There is more opportunity for readers to discuss and interact with others while searching for relevant material, which can

effectively narrow searches for resource material and save time. The main interactive, collaborative activities reported between participants are listed below:

- Talking about books: patrons discussed the contents of books and pointed out aspects that stood out. They discussed either the images or the content that interested them. They drew the attention of others in the group to topics that may be relevant to their research, subsequently narrowing their search.
- Pointing to content: each group member read a different book and drew the attention of the others to interesting content.
- Shared searching: information was shared between members of the group, which helped narrow the search. The group was able to access a large volume of books by sharing and researching the resources collectively.
- Reading together: it was observed that if the group came across an interesting and relevant to their search, they read the book together. Either one-group member read the book aloud and shared the interesting information with others, or the group gathered around a table and read the book simultaneously, in silence.

Although, this sort of interaction occurred in academic and public libraries, there were differences in the nature of the interactions. First, participants in the academic library talked about books as an information resource for research purposes, while in public libraries readers discussed books for the exchange of knowledge and experiences. For instance, in a public library, Hp5 put an art history book on a table, flipped the pages slowly and talked to her partner about some images. In contrast, Ha5 and Ha6 were two patrons who visited the university library, spending 19 minutes searching for useful resources. They talked about available books in front of the catalogue, shelves and tables. They held a note with the names of some books, pulled books from shelves, flipped pages, and showed and read the content to each other. Second, by sharing the search among participants in both environments, we notice that in academic libraries, patrons searched together for the same objectives. They divided the tasks between each other, and looked at similar resources. In public libraries the situation is rather different: participants in most cases appeared to have individual

aims, and they shared the search tasks as a form of assistance. Third, in the academic library, patrons read books together or simultaneously in silence. However, in public libraries, it was observed that some groups visited the library solely to read books, especially family groups. Parents sat on sofas and tables reading stories aloud to their children, and most of these books were not issued. Only 29 out of 57 family groups issued books before leaving the library.

### **5.3 Libraries as third places: social interaction**

The concept of libraries as a third place has been widely discussed, and researchers have questioned the way library buildings should be designed (Bryant et al., 2009). Mehta and Bosson (2010) have described the third place as “a place of refuge other than the home or workplace where people can regularly visit and commune with friends, neighbours, co-workers, and even strangers.” Libraries are a place where informal social interactions can occur and visitors from different backgrounds can meet and communicate. This is what exactly our observations (see Section 4.3) indicate, there are two main social collaborative activities between participants;

- Chatting and talking: group users in academic and public libraries talked and chatted. This was sometimes related to their search, and sometimes related to topics that emerged from the books.
- Spending time together: visiting public libraries was a social experience for patrons. They visited in groups and casually browsed and talked to each other about matters possibly unrelated to their search.

In terms of chatting and talking, patrons of the academic library had different conversations, sometimes with group members or with patrons searching next to them. Nevertheless, these conversations always seemed to end with books, or information related to group work. Conversely, participants in public libraries chatted about life, culture, religions and children (see Section 4.7). The sociability of the public library environment provides an opportunity for patrons to talk about a variety of topics. Customers contribute to most events and activities organised by the library. For example, the library organised a celebration of the Indian festival of lights, and a number of families participated in the event. Children and

parents learnt about Indian rituals, they sang, played and partook in leisure activities together. Hp20 and Hp24 were two mothers from different groups who joined the event, but spent time talking to each other while their children listened. Libraries also hold 'story activities', where all children and parents sit on the floor and a librarian reads a story. They interact with each other by answering questions, and parents can converse with each other. Most conversations were about children and food. Groups of adults also engaged in casual talk. Hp105, Hp106, Hp107, Hp108 and Hp109 were a group of teenagers who sat on the sofas, played games and talked about general topics, before moving to the second floor for a study meeting:

Hp106 sits on a sofa in the children's section, playing with her iPad, and then at 10:20 Hp109 comes and sits with her. Hp105, Hp107 and Hp108 come, and they all sit together, chatting. They play with cards, guessing the words on them. Hp109 goes to the magazine shelves and walks without touching them, then returns to his friends and joins their games. They move to the second floor, find a table and sit and study together.

Academic libraries have more facilities for the spending time than public libraries. The library studied contains a separate floor for students, with cafes, comfortable seating and several snack vending machines. In the public libraries there was only one coffee machine, some tables and chairs on each floor, and some sofas in the children's section. However, seven patrons out of 37 observed spending time in the academic library, compared to 92 out of 108 participants in the public library. This might be because the observation took place around the bookshelves, and all facilities were near the public libraries, enabling easy identification of whether readers visit the library for leisure or other purposes. In contrast, participants at the academic library can spend their time on the first floor, then move to the second floor to search for and interact with books. Thus, those who were assumed to be spending time in an academic library may, in fact, have been there for an unknown purpose. They may have initially wanted to look at the bookshelves and return later to search intensively. Alternatively, they may have finished their search before the observation began.

At the public libraries there were a number of participants who visited the library to use the Internet, for group meetings and to rest at the sofas and tables. Four groups were observed booking Internet time; two left the library, then returned on time to use the Internet; the remaining two waited at the tables next to the computers until they could use them. For example, Hp12 and Hp13 booked Internet time, then left and returned after 25 minutes to use the computer, and finally left. Second, two groups visited the library for a group meeting. Some interacted with bookshelves, while others preferred to sit at the tables, waiting for the meeting to begin. One of the two groups consisted of 10 members. They went directly to the second floor, found a table, and sat together generating ideas. Hp92 talked while the others listened. He asked them for suggestions, apparently for a project they were working on. They stopped and watched TV; one of them walks between shelves, looking to the books without taking any. They leave together. Finally, two groups enter the library to rest. It is clear that the two groups may pass by the library and sit inside for some time, then continue on their way. For instance, Hp69 and Hp70 enter the library and go directly to the second floor. They find a table. Hp69 opens her iPad and puts her laptop on the table. Hp70 uses his mobile phone, then they both leave.

All of these purposes for visiting the library have been classified within the 'spending time' category in public libraries, but in the academic library, such activities were not observed because all computers, devices and other facilities were located separately from the bookshelves.

## **5.4 Children in physical and digital libraries**

One of the main groups observed in public libraries were children. The study looked at how children locate reading material and examine books for selection. Children's decision-making behaviour has been reported, to indicate the criteria that influence their decisions. As mentioned previously (see Section 5.3), public library organise educational and recreational activities for children. They can enjoy reading, singing and playing games, as well as interacting with bookshelves. Some families visited the library for only one purpose: to participate in such activities. Both parents and children played games sang and indulged in casual talk about topics other than books. Public libraries have a social environment in

which families can sit on the floor, a couch or at a table and read stories for and with children. Playing with pillows, rocking horses and pulling books from book bins were regularly performed by children.

Conversely, in the terms of selecting books, many parents were observed choosing books for their children first, then searching for their own books. Book decisions were made by children in some cases, and according to parents' suggestions in other cases. A number of parents also directed their children to choose books that were neither too hard nor too easy. Children were interested in book covers more than any other aspects, and regularly made decisions based on them.

Both book and social interaction are missed in DLs, especially for family groups. DLs need to create a welcoming environment for children as well as parents, similar to public libraries. They should also have more features suiting family groups, enabling them to work individually or collaboratively. Additionally, they should enable children to select their own books, or share the selection process with their parents.

## **5.5 Collaborative sharing in physical and digital libraries**

Collaborative work and verbal versus non-verbal interactions (Cunningham et al., 2013) are not only related to book selection processes, but also associated with search behaviour within groups. Participants share tasks in a similar way in both environments, including adults dealing with children. Two commonly observed sharing behaviours between participants were (see Section 4.4).

- One patron finishes their task and assists partner;
- One patron searches the online catalogue, while the other watches or writes notes.

The focus of the share interaction was to ascertain participants' patterns and identify the different scenarios regarding collaborative group work. The only scenario for the sharing behaviours above was when readers shared the same location at the same time. However, with the first approach, some patrons finished their selections and assisted their partners to search the bookshelves. Similarly, in



family groups, parents helped one child, then moved to the second one. In such cases, each reader might start in a separate location, then move to the same location, but will interact at the same time. In the second sharing behaviour, group readers were in the same location at the same time, looking at the same screen. Additional collaborative search interactions observed between parents and children where when one parent gave instructions and children followed. The same scenario can be applied to such interactions, though patrons may be away from each other, and children still can be supervised. These sorts of interactions during the search process can increase chatting and the exchange of knowledge and information (Hinze et al., 2012). Further, open communication with other users may provide search assistance and support (Renda & Straccia, 2005).

Book sharing in physical libraries is typically synchronous, while in DLs it is more likely to be asynchronous (Twidale et al., 1997). Actions such as passing a book, pointing to books, showing or pointing to content, reading aloud, or looking over a shoulder are not supported in DLs, as well as collaborative book searching (Cunningham et al., 2013). The results from our study indicate that not only book interaction can be missed in DLs but also the social interaction within group patrons is hardly supported.

Furthermore, two different interaction scenarios occur in physical libraries where users can share location, interact at same time or each patron start from different locations then move to same location and interact at same time. In my previous work, I introduced three scenarios of collaborative use of DLs (Alqurashi, 2013):

1. Shared location, shared screen, and same time: users collaboratively access DLs for research from the same location, and search for resource material concurrently. By doing so, users can work effectively and are able to communicate in real time, and discuss their search with each other.
2. Separate location, separate screen, same time: users might need to work simultaneously, using separate screens in separate locations. Synchronous mode can be very effective for discussion and collaboration, as there is a quick and immediate response between users.

3. Separate location, separate screen, different time: group collaboration can occur between users in separate locations, using separate screens and working at different times. Communication may be synchronous or asynchronous, depending on the urgency of response. If an immediate response is required, a synchronous mode is most effective. In instances in which the response can be delayed, the asynchronous mode can work for group collaboration.

The possible scenarios in both physical libraries and DLs might differ in regards to book interaction, and sharing search interaction. DLs can easily support most observed sharing task behaviours in public and academic libraries. For example, in a DL, patrons can still finish their tasks, then assist their partners to search. Similarly, one user can search in a DL, while the other watches or writes notes. In contrast, book sharing interaction hardly occurs in DLs. However, asynchronous collaboration methods might only be supported in DLs, eBook collections and digital search systems (such as email or social bookmarking) (Cunningham et al., 2013). Collaborative reading can occur in two situations, in which the user can either be in the same location or a remote location, and can be accessible either at the same time or a different time (Pearson et al., 2012).

In current Digital Libraries, only one scenario might work for the three types of group collaboration, in which users share the location and screen, and interact at the same time (except for the spending time in social interaction category, and the patron finishes her/his task and assists partner in shared search interaction category). However, this is not explicitly supported by the DL software, rather it is a feature of people sharing a computer.

## **5.6 Implications for digital collaborative work**

Collaborative interaction between group patrons may be analysed for three components: one focuses on book interaction, another on shared search interaction, and the last on social interaction. This section presents the application of aspects in digital environments, and how communication between users can be encouraged and enhanced.

Renda and Straccia (2005) emphasise that DLs need to be more efficient, in order to ensure that interaction between users is more collaborative. Information in DLs might address generic users' individual needs, but does not meet any

group users' purposes. Group participants in both public and academic libraries were observed communicating during the search process, selecting books and making the decisions. This was a very effective way of exchanging information and discussing available, relevant material, then choosing the right resource. In contrast, lacking peer support while researching in a DL might complicate the search process, and lead group patrons to use physical libraries instead. The group collaborative selection is not currently supported by either DLs or eReaders. Pearson et al. (2012) state that '[c]o-reading addresses collaboration once joint reading has commenced, but the prior decision process is unaffected' (Cunningham et al., 2013). Renda and Straccia (2005) suggest that DLs might be enhanced by providing a digital forum, in which users can openly communicate with each other and assist each other in the search process. By doing so, users may benefit from each other's knowledge and recommendations for refining and narrowing a search, and work collectively as if in a group.

The findings of our previous study (Alqurashi, 2013) indicated that academic library users follow patterns, in which each task is divided, and one member undertakes a catalogue search, while another physically removes books from the shelf, and another read the contents to ascertain their search. Similar approaches were observed in the study reported in this Master's thesis between patrons in the academic library (see Section 4.4). However, this mode of collaboration can only exist in DLs when users work together in the same location, at different computers. However, this will be inconsistent with the tactile presentation of document material, and the interaction is intangible.

Further, the experiences of information exchange and casual conversations with other readers can only occur in a physical environment. Visiting libraries was a social experience, especially for public library patrons. They spend time chatting, browsing and communicating with others about books, or topics unrelated to the search. Conversely, lack of social interaction and the inability to exchange knowledge is a drawback of DLs. Several digital systems—such as cloudbooks and family story play—address aspects of shared physical environment experiences. 'Shared wishlists (e.g. as offered by Amazon) have a different focus (information instead of shared experience) and fall short of many of the criteria', state Cunningham et al. (2013). The observed social activities in public and academic libraries—such as chatting and spending time—can be

presented in the social networks and web applications, in which users have opportunities to communicate and discuss various subjects.

Although digital applications do not focus on book interactions, users can still discuss, comment and give feedback on books. Users can share materials through social networks like Facebook or LibraryThing, and type messages, or leave voice services like Skype. However, these digital tools can only support a remote interaction between users, not group dynamics and co-located collaboration. Providing chat and discussion windows, tags, pointers and blogs can resolve the lack of social interaction and the inability to exchange information in DLs. Users are able to exchange notes, post comments and feedback about resource material (Cunningham et al., 2013). At present, no digital system can support social gathering activities, in which users can involve themselves in group reading or cultural events. There is also a limitation in addressing both the immediate interaction between peer users, and support for users in different sets of behaviours (Cunningham et al., 2013).

Table 2 summarises and illustrates the collaborative interaction behaviour between users in digital applications similar to the observed interaction in public and academic.

Applications	Book interaction				Social interaction		Share search interaction	
	Talking about books	Pointing to content	Shared searching	Reading together	Chatting	Spending time	Partner search assisting	Searching in similar place in same time
Digital libraries								
ebook readers	X			X	X			
cloudbooks	X	X		X				
Family story play	X			X	X			
Shared wishlist								
Video/audio messages	X	X	X	X	X	X		
Social network	X				X	X		
book-based social networks	X				X	X		
Blogs	X				X	X		

**Table 2: Collaborative interaction behaviour supported in digital applications (X means support for feature, empty cell means no support)**

From Table 2, it is clear that the digital environment can partly support book and social interaction, but such interaction will not be tactile or natural, as it is in

physical libraries (Cunningham et al., 2013). It is important for DLs, in particular, to more effectively implement features that enable different patterns of interaction, similar to those observed in physical libraries. Readers should be able to communicate and gain an immediate response whenever they want, regardless of time and place. Our previous project (Alqurashi, 2013) made a number of recommendations for improving communication between users, in six interactive activities observed in physical libraries. For example, chat windows, can be used by two students in scenario B (separate locations, separate screens, same time); enabling them to casually chat during the search process, and share searches or read together. Further, they can talk about books or point to content, in both scenarios B (separate locations, separate screens, same time) and C (separate locations, separate screens, different time).

## **5.7 Summary**

Physical interaction with books, the ability to work collaboratively and the possible social interaction with other patrons all are advantages that physical libraries provide for patrons, as observed in our study. Patrons can interact with the books in the libraries in between engaging in several other activities that might not be at all related to books. They can also enjoy a welcoming friendly environment where children and parents can spend time as well as read books. However, we believe that DLs need to move forward to simulate some of the advantages of the physical libraries environment and thus better satisfy patron's requirements. The findings of this study reveal a range of interaction shortcomings in DLs that require significantly more consideration from researchers and designers. DLs need to move from generic to more synchronous and asynchronous communication with users, depending on location and time. The observation suggests that users in physical libraries behave differently, according to visiting purposes. The nature of the interaction also varies according to the type of library, and the user sample.

Our findings noted two different samples of visitors to public libraries—children and adults—whereas in the academic library, only adults were observed. We believe that none of the collaborative interaction behaviour between both age groups have been considered in any DLs design features. Additionally, digital

libraries face challenges in different information need domains, where group users require satisfaction-locating documents, and with exploratory browsing and share tasks.

## **Chapter 6: Conclusion and Recommendations**

### **6.1 Overview**

This chapter summarises this research and draws conclusions from the study (Section 6.1); it discusses the limitations of our work and provides suggestions for future work (Section 6.2). It ends with recommendations for possible enhancement and development in Digital Libraries (Section 6.3).

### **6.2 Summary and conclusions**

The challenges DLs face have attracted the attention of many researchers and designers, due to the vital role of their information-seeking processes, and documents used. Additionally, many researchers explored features of physical libraries. However, most studies focussed on individuals, and little of the few observations of groups of patrons has yet been transferred into effective search systems or design features. Initial discussions about those possible extensions can be found in our own work (Alqurashi, 2013) and the upcoming (Hinze et al. 2014).

Consequently, this study was undertaken to discover the patterns of interaction of groups of patrons with physical book collections, and raises several questions about collaborative selection behaviour, which might result in significant implications for DLs. In this study, we observed different physical libraries, and observed the characteristics of group patrons in both environments. Generally, participants were students at undergraduate or graduate level in the academic library, and in the public libraries they belonged to a variety of age groups. 83 groups were observed overall, with 213 participants, including children. This thesis focused on the way participants treated each other when browsing bookshelves, selecting books and making decisions, taking into consideration all social activities observed between participants in both public and academic libraries. Further, it tried to draw conclusions about the purposes for library visits depending on family conversations, body language, the use of notes and tools that participants brought to the library, and activities groups undertook in the library.

Based on the observations, we conclude that the layout and atmosphere of the physical space in both environments can significantly affect patrons' behaviour in different ways. For example, the academic library is located inside

the university campus, which leads participants to have specific objectives for their visits. In contrast, visiting public libraries seemed more of a social and recreational experience for most patrons. It became evident that the public libraries are designed in ways that provide opportunities for patrons to participate in different social activities and interact with bookshelves concurrently. In the observed academic library, the bookshelves are located on a separate floors, which means that once participants have entered that floor they typically engage in book searching as no other services that would support social interaction (e.g., coffee machines) are available. Cunningham et al. (2013) also indicated that understanding the physical environment of bookshops can lead to the identification of the features that might support social group collaboration and book assessment in DLs. Researchers and designers require intensive theories to develop social activities and collaborative reading in DLs.

Another significant finding is that commonly, some patrons in both environments were very familiar with the library layout, which can considerably simplify their search and selection processes, and save time. Readers who visit the library frequently are able to recognise the layout, and select books without trouble or needing to search various locations, or the library catalogue.

Most importantly, group patrons in the academic library often followed a search pattern and strategy, in which all group members searched the same location side by side, and shared tasks among them. One user looked for books on the top shelf, while others looked on the middle and bottom shelves, or vice versa. These patterns of collaboration are currently not supported in digital libraries. In public libraries, participants entered the library together, but did not necessarily search collaboratively, or in the same location. They searched individually, but then shared the selection outcome and discussed some information and content. Patterns of engagement were most clearly seen in family groups, in which parents assisted their children in selecting books. Although some children left alone to choose books, parents directed them in some ways, to select age-appropriate books. Children enjoy the public library experience and the process of selecting stories individually, from book bins in particular. Fundamentally, our findings confirmed Cunningham et al.'s (2013) observation that in public libraries the 'engagement with the books themselves seems to be relatively indirect and based



more heavily on browsing than on searching'. Again, no support was found in Digital Libraries for the collaborative aspect of these observed interactions.

Ultimately, this study highlights various aspects that should be examined further and questioned by researchers, especially information-seeking behaviour and their implications not just for physical libraries, but also digital environments. Advantages for the physical realm may also hold advantages for DLs, and support book users' interactions as readers, searchers and browsers. It is also the time for DLs to simulate parts of the social library experience, particularly those in which users can engage in different social and collaborative activities in public and academic DLs that are not just specifically related to books.

### **6.3 Limitations and future research**

This study was limited to 17 groups in the academic library, and 66 in the public libraries. Thus, the number of general observed patrons in public libraries was much larger than in academic libraries, which means the results of the comparison may be of limited generalizability and may not reflect the situation in the academic library in sufficient detail. At the time of the study, we visited the academic library frequently and for long periods, and even though in previous studies in the same library many groups were observed, on these occasions most visitors searched individually for books, so it was hard to report on peers or groups of participants. Additionally, it was difficult to identify the purpose of visits to public libraries, and whether they wished to interact with books or not, so we observed all groups, even those who entered the library to rest on the sofas. However, in the academic library we only reported groups who interacted with bookshelves, or used the online catalogue.

Furthermore, observation as a method provides information that depends upon participants and their body language, which leads us towards assumptions for each action and behaviour, and discuss the results accordingly. Our study purposefully focused on observations of library patrons (qualitative method), so that patrons can be observed in their interactions with bookshelves and with each other without any interruption. However, it would be beneficial to explore the patrons' actions and interactions with each other by additionally *interviewing* them to understand and determine the reasons for their interactions and behaviour.

The current study addressed a gap we had identified in the literature, about the experiences of physical libraries as a third place, and reflects the discussion of DL environments. In addition, it sought to understand the challenges facing DLs in supporting casual browsing, provide opportunities for investigating and comparing book collections, and consolidate collaborative interaction between information seekers. It would be productive for future research to uncover the challenges that DLs face, with the aim of comparing these presented areas. Building on the current study in this way could bring rewards for patrons using the DL environment.

#### **6.4 Recommendations for digital libraries**

Both physical libraries and DLs should consider the important role that libraries can play in the well-being of their community. They should turn their attention to the unique needs of information seekers, who wish to access and research information, as well as communicate synchronously and asynchronously with other users. The following recommendations are, therefore, offered for designers, practitioners and academics researchers:

1. **Support for group interaction in DLs:** Designers will play a critical role in changing digital library applications. We strongly emphasise the need for well-designed effective Digital Library systems that can assist users in group interactions and social interactions that mirror those of the patrons' experiences in physical libraries.
2. **Extended group interactions:** In addition to enabling group interactions similar to physical environments (i.e., same time and location, as in 2. above), digital users have the opportunity to be supported in synchronous and asynchronous situations. Thus, there is a need to develop systems that are an extension of the co-browsing prototype.
3. **Supporting families in DL:** Family groups are one type of patrons that we observed in the study reported in this thesis. We found that they enjoy the social experience of the libraries, which means that DLs should provide a family-friendly environments for both parents and children, in which they can share the searching for books, reading

together, and enjoy their time together.

4. **Academic vs public DLs:** Our study observed similarities and differences between the social and collaborative interaction among groups of patrons in public and academic libraries. Digital Libraries might also benefit from explicitly considering and recognising the differences in requirements for users of public DLs and academic DLs.

Physical libraries still play an effective role in supporting information seekers, and satisfy their needs, despite the many challenges they face. However, based on our work, more can be done to achieve results in both the physical realm and the digital environment. Developing DLs can assist users with greater opportunities for browsing, searching and investigating resources, while collaborating with peers or family members.

## References

- Acherman, M. (1994). Providing social interaction in the digital library. *Proceedings of the Digital Libraries Workshop-DL '94*, 198-200. Retrieved from <http://web.eecs.umich.edu/~ackerm/pub/94b11/dl94.final.pdf>
- Alqurashi, H. (2013). *Collaborative and social interaction between group patrons in library and bookshops* (Unpublished postgraduate diploma thesis). University of Waikato, Hamilton, New Zealand.
- Audunson, R. A., Vårheim, A., Aabø, S. & Holm, E. D. (2007). Public libraries, social capital, and low intensive meeting places. *Information Research*, 12(4). Retrieved from <http://www.informationr.net/ir/12-4/colis20.html>
- Auerbach, C. F. & Silverstein, L. B. (2003). *Qualitative data: an introduction to coding and analysis*. New York, NY: New York University Press.
- Brand-Gruwel, S., Wopereis, I. & Vermetten, Y. (2005). Information problem solving by experts and novices: Analysis of a complex cognitive skill. *Computers in Human Behavior*, 21, 487–508. doi: 10.1016/j.chb.2004.10.005
- Brown, M. E. (1991). A general model of information-seeking behaviour. *Proceedings of the ASIS Annual Meeting*, 28, 9-14.
- Bryant, J., Matthews, G. & Walton, G. (2009). Academic libraries and social and learning space: A case study of Loughborough University Library, UK. *Journal of Librarianship and Information Science* 41, 7-18. doi: 10.1177/0961000608099895
- Buchanan, G., & McKay, D. (2011). In the bookshop: Examining popular search strategies. *Proceedings of JCDL'11: The 11th annual international ACM/IEEE joint conference on Digital libraries*, 269-278. doi:10.1145/1998076.1998127
- Crabtree, A., Twidale, M., O'Brien, J. & Nichols, D. (1997). Talking in the library: Implications for the design of digital libraries. *Proceedings of DL '97: The second ACM international conference on Digital libraries*, 221-228. doi:10.1145/263690.263824
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage Publications.

- Cunningham, S.-J., Vanderschantz, N., Timpany, C., Hinze, A. & Buchanan, G. (2013). Social information behaviour in bookshops: Implications for digital libraries. *Research and Advanced Technology for Digital Libraries: Lecture Notes in Computer Science*, 8092, 84-95. Retrieved from [http://link.springer.com/chapter/10.1007/978-3-642-40501-3\\_9](http://link.springer.com/chapter/10.1007/978-3-642-40501-3_9)
- Freeman, G. T. (2005). The Library as place: Changes in learning patterns, collections, technology, and use. In *The library as place: Rethinking roles, rethinking space* (p. 6). Washington, DC: Council on Library and Information Recourses.
- Hertzum, M. (2008). Collaborative information seeking: The combined activity of information seeking and collaborative grounding. *Information Processing & Management*, 44(2), 957–962. doi: 10.1016/j.ipm.2007.03.007
- Hinze, A., Alqurashi, H., Vanderschantz, N., Timpany, C., & Alzahrani, S. Social information behaviour in physical libraries: Implications for the design of digital libraries. *Proceedings of the Digital Libraries 2014 (joint conference of ACM/IEEE Joint Conference on Digital Libraries (JCDL 2014) and International Conference on Theory and Practice of Digital Libraries (TPDL 2014))*. Paper submitted for presentation.
- Hinze, A., McKay, D., Vanderschantz, N., Timpany, C. & Cunningham, S. (2012). Book selection behavior in the physical library: Implications for ebook collections. *Proceedings of JCDL '12: The 12th ACM/IEEE-CS joint conference on Digital Libraries*, 305- 312. doi:10.1145/2232817.2232874
- Gayton, J. T. (2008). Academic libraries: ‘social’ or ‘communal?’: The nature and future of academic libraries. *The Journal of Academic Librarianship* 34, (1), 60–66. doi: 10.1016/j.acalib.2007.11.011
- Griffis, M., & Johnson, C. (2013). Social capital and inclusion in rural public libraries: A qualitative approach. *Journal of Librarianship and Information Science*, 1-14. doi: 10.1177/0961000612470277
- Koschmann, T., & Stahl, G. (1998). *Learning issues in problem-based learning: Situating collaborative information seeking*. Paper presented at the Conference on Computer Supported Cooperative Work (CSCW '98), Workshop on Collaborative Information Seeking. Seattle, WA.

- Leckie, G. J. & Hopkins, J. (2002). The public place of central libraries: Findings from Toronto and Vancouver. *Library Quarterly*, 72(3), 326–372. Retrieved from <http://press.uchicago.edu/ucp/journals/journal/lq.html>
- Li, C., Poe, F., Potter, M., Quigley, B. & Wilson, J. (2011). *UC libraries academic e-book usage survey*. Oakland, CA: California Digital Libraries.
- Lindahl, G. (2012). *The anatomy of search technology: Crawling using combinators* [Weblog]. Retrieved from <http://highscalability.com/blog/2012/5/28/the-anatomy-of-search-technology-crawling-using-combinators.html>
- McDonald, D. W. & Ackerman, M. S. (1998). *Just talk to me: Field study of expertise location*. Paper presented at the Conference on Computer Supported Cooperative Work (CSCW '98). Seattle, WA.
- McKay, D. (2011a). A jump to the left (and then a step to the right): Reading practices within academic ebooks. *Proceedings of OzCHI '11: The 23rd Australian Computer-Human Interaction Conference*, 202–210. doi: 10.1145/2071536.2071569
- McKay, D. (2011b). Gotta keep 'em separated: Why the single search box may not be right for libraries. *Proceedings of CHINZ '11: The 12th ACM SIGCHI New Zealand Chapter's International Conference on Computer-Human Interaction*, 109–112. doi: 10.1145/2000756.2000772
- McKay, D., Buchanan, G., Vanderschantz, N., Timpany, C., Cunningham, S.-J. & Hinze, A. (2012a). Judging a book by its cover: Interface elements that affect reader selection of ebook. *Proceedings of OZCHI '12: The 24th Australian Computer-Human Interaction Conference*, 381-390. Retrieved from <http://hdl.handle.net/10289/8054>
- McKay, D., Hinze, A., Heese, R., Vanderschantz, N., Timpany, C. & Cunningham, S.-J. (2012b). An exploration of ebook selection behavior in academic library collections. *Theory and Practice of Digital Libraries: Lecture Notes in Computer Science*, 7489, 13-24. Retrieved from [http://link.springer.com/chapter/10.1007/978-3-642-33290-6\\_2](http://link.springer.com/chapter/10.1007/978-3-642-33290-6_2)
- McKay, D., Preeti, S., Hunt, R. & Cunningham, S.-J. (2004). Enhanced browsing in digital libraries: Three new approaches to browsing. *International Journal on Digital Libraries*, 4(4), 283–297. doi: 10.1007/s00799-004-0088-6

- Mehta, V. & Bosson, J. K. (2010). Third places and the social life of streets. *Environment and Behavior*, 42(6), 779–805. doi:10.1177/0013916509344677
- Moore, P. (1995). Information problem solving: A wider view of library skills. *Contemporary Educational Psychology*, 20(1), 1–31. doi: 10.1006/ceps.1995.1001
- Pearson, J., Owen, T., Thimbleby, H. & Buchanan, G. R. (2012). Co-reading: Investigating collaborative group reading. *Proceedings of JCDL'12: The 12th ACM/IEEE-CS joint conference on digital libraries*, 325–334. doi:10.1145/2232817.2232876
- Renda, M. E. & Straccia, U. (2005). A personalized collaborative digital library environment: A model and an application. *Information Processing and Management* 41(1), 5–21. doi:10.1016/j.ipm.2004.04.007
- Reutzell, D. R. & Gali, K. (1998). The art of children's book selection: A labyrinth unexplored. *Reading Psychology*, 19(1), 3–50. doi:10.1080/0270271980190101
- Ross, L. & Sennyey, P. (2008). The library is dead, long live the library! The practice of academic librarianship and the digital revolution. 34(2), 145-152. Retrieved from <http://www.sciencedirect.com/science/journal/00991333>
- Rouse, W. B. & Rouse, S. H. (1984). Human information seeking and design of information systems. *Information Processing and Management*, 20(1-2), 129–138. doi: 10.1016/0306-4573(84)90044-X
- Talja, S. (2002). Information sharing in academic communities: Types and levels of collaboration in information seeking and use. *New Review of Information Behaviour Research*, 143–159. Retrieved from [http://www.tandfonline.com/loi/ribr20#.U9rYm\\_19JuA](http://www.tandfonline.com/loi/ribr20#.U9rYm_19JuA)
- Timpany, C., Alqurashi, H., Hinze, A., Cunningham, S.-J. & Vanderschantz, N. (2012). *Shared browsing and book selection in academic libraries* (Working paper 05/2012). Hamilton, New Zealand: University of Waikato, Department of Computer Science. Retrieved from <http://researchcommons.waikato.ac.nz/handle/10289/6965>
- Twidale, M., Nichols, D. M. & Paice, C. D. (1997). Browsing is a collaborative activity. *Information Processing and Management*, 33(6), 761–783.

doi:10.1016/S0306-4573(97)00040-X

- Twidale, M. B. & Nichols, D. M. (1998). Designing interfaces to support collaboration in information retrieval. *Interacting With Computers*, 10(2), 177–193. Retrieved from <http://www.comp.lancs.ac.uk/computing/research/cseg/projects/ariadne/docs/design.html>
- Vårheim, A. (2007). Social capital and public libraries: The need for research. *Library & Information Science Research*, 29(3), 416–28. doi: 10.1016/j.lisr.2007.04.009
- Vårheim, A., Steinmo, S. & Ide, E. (2008). Do libraries matter? Public libraries and the creation of social capital. *Journal of Documentation*, 64(6), 877-892. doi: 10.1108/00220410810912433
- Vårheim, A. (2009). Public libraries: Places creating social capital? *Library Hi Tech*, 27(3), 372–381. doi:10.1108/07378830910988504
- Wilson, T.D. 2000. Human information behavior, *Informing Science*, 3(2), 49-55. Retrieved from <http://www.informingscience.us/icarus/journals/informingscij/>



## Appendix A

### Collected data in public libraries by Laura

User's id	Description
Lp1, Lp2	They search shelves for Thomas the tank engine books. The child calls out the whole time, "I want Thomas". After searching the shelves they ask for librarian assistance. The librarian shows them the correct shelf, and then the child is left to choose books while the parent goes to the adult book section.
Lp3, Lp4	Parent pushes child in chair around shelves to large picture books. Parent picks up books based on cover and gets child to choose final decision. Two books are chosen. They then sit on library couches and read one book. The other is taken to be issued.
Lp5, Lp6	Child is more interested in playing on rocking horse than looking at books. Parent annoyed, "How are you supposed to learn to read if you don't look at the books." Child glares at mother and chooses the nearest book. Parent laughs at selection, "You don't want to read the secret diary of boys". Child,: Yes I do" and continues playing. Parent continues the search for books and makes final decisions.
Lp7, Lp8	They search through the audio books. Child picks up a book and parent says, "You got that one last time". Child replies, "but I liked it". Child throws tantrum. Embarrassed parent decides to get book anyway and removes child from the library.
Lp9, Lp10	Child plays on rocking horse while parent looks at shelves to find books. Parent tried to make child whisper in library. Child starts repeating, "can I get off the horse now? I don't want Scooby doo!" Parent replies, "stay on the horse". After parent has made book selections, they both go to couches and read books about horses. Child, "they eat carrots, I love carrots". Child wants to issue 6 books and promises that all will be read.
Lp11, Lp12	They use library catalogue to look up encyclopedias. Child has a sheet of paper with homework instructions. After encyclopedias are selected they sit at table to far end of children's book section. Parent encouraged child to use index to look up key words. When child became stuck after no successful word searches, the parent suggested alternatives. Child records important facts in a workbook.
Lp13,	Child goes straight to rocking horse, rocks for a minute surveying the area

Lp14	and then goes straight to the comic books. He picks up a comic, thumbs through a few pages and then bursts into laughter. The joke is shared with the parent, who then helps the Child to search for the next comic in the series. The books are then taken to the issuing desk.
Lp15, Lp16	They look through CDs. Child is impatient to leave the library. Sister promises an ice cream if child is good and states, "Mum said get chapter books, go find them. Child stomps off with lip out to children's section and less than two minutes later returns with vampire books. Sister jokes, do they sparkle? [Like twilight series], child is very offended but sits down on ground at sisters feet and thumbs through pages until CD selections have been made.
Lp17, Lp18, Lp19	They use catalogue to find ballet books, and then go to correct section. Parent, "see girls this is far more efficient". Children then thumb through pages before selecting two books, which appear to have lots of costume pictures
Lp20, Lp21	Child sits on couch while parent selects book. Parent reads book out loud, while child plays games on the phone. Parent, "stop it! If you don't read you won't learn more about dinosaurs". Child just glares and goes back to games. Parent ignores expression and instead reads the book to herself.
Lp22, Lp23, Lp24	They go straight to the section of Hairy MacLary and pick up 7 books. The pile is taken to a small table where they discuss which books have previously been read. The girl chooses a book about the character Slinky Malinky and the Boy chooses a book about Scar Face Claw. The parent looks at the covers and chooses two more books to issue.
Lp25, Lp26	They browse around bookshelves in children's section before returning to the shelves of the author Paul Jennings. The child comments that a friend has read this author before and said the books were good. The child reads the blurbs on the back of a few books before making a choice, then they both go to the adult section.
Lp27, Lp28, Lp29, Lp30	Father sits on couch, while mother and twins look through large picture books. 10 books are selected based solely on the cover picture. One of the children shouts, "look Dad, a fishing one for you!". All book are then taken to be issued.
Lp31, Lp32	Child starts by reading a 'Where's Wally' book. Grandfather prompts the child should be reading chapter books. Child wanders the shelves and chooses books based on their covers. Grandfather thumbs through books

	saying, "you can read harder books this, these are for babies". Once Grandfather is happy with book selections, they sit at a table and do "where's wally" puzzles until the Child's mum collects them.
Lp33, Lp34	Parent browses catalogue, while child goes to shelves to select science books. After thumbing through the pages to select a book the child sits down at a table to read while he waits for his father to browse the catalogue system. They both then go to the adult section.
Lp35, Lp36, Lp37	Parent and children arrive with children carrying orange shoulder bags. Children browse the shelves while parent reads a magazine on the couch and return with full bags of any books of interest. They then sit at a table and show their parent their selections. The parent gets them to narrow down the selection to 5 books each; otherwise they "will run out of time to read all the books."
Lp38, Lp39	They look through audio books. Child pulls four selections down on the floor and plays 'eeny meeny miney mo' to make final decisions. The parent chooses a further 3 selections by reading the back blurbs' content.
Lp40, Lp41, Lp42, Lp43	Librarian assistance is sought by parent and girl to find 'Nanny Figians' books. Boys browse the shelves to find their reading books based on cover pictures and comments about what their friends have been reading. Once each child had three books they took them to be issued.
Lp44, Lp45, Lp46	Parent gets children to use the library catalogue to search for their book names and topics. Once selections have been made the parent get the children to write down the library reference book numbers to find them on the shelves.
Lp47, Lp48, Lp49	Parent and oldest child browse shelves while youngest child runs around library shelves picking up any book with an interesting cover. Once parent has finished helping oldest child, then begins picking up after the youngest. Oldest child collects 10 books from the shelves by thumbing through pages and taking time to read the back blurb. Oldest then suggests book options that she had previously read to youngest child. "Look at the Nutcracker and his moustache!". While parent looks for more books the children play in the library space and look through a tube hole in a couch at each by lying tummy first on the floor.
Lp50, Lp51, Lp52	Male child picks up a book based on cover from teenage section and sits on couch while parent and younger child search the library catalogue. Once books are located on the shelves they issue the items and leave.

Lp53, Lp54, Lp55	Male child asks librarian what are the books wrapped in brown paper. Librarian says they are junior fiction adventure novels for children who have trouble picking books to read. While parent and younger child browse the shelves the male child issues one of the mystery adventure books at the counter. After 10 minutes of looking the other child leaves the library with no books, "I cannot find anything I want to read."
Lp56, Lp57, Lp58	Grandmother and grandchildren search for books in the teen and children section of the library. After a few minutes the grandmother sits down and just watches the children. The children look at the covers of comic and thumb through the pages to see if they have already read the story, while debating the merits of Spiderman vs. Batman in a fight. After talking for almost 20 minutes they leave the library without any books.
Lp59, Lp60, Lp61, Lp62	Male child finds 'Jack and Jill' nursery rhyme book on shelf and begins to sing as he looks through the pages. After he wants to find more nursery rhyme books so he and his dad go to the librarian to be pointed to the correct shelf. Mum and female child pick books up based on the cover picture. After choosing 10 books in total they issue the books and then sit on a couch to read the books that will not be taken out of the library.

### Collected data in public library by Hayat Alqurashi

User's id	Description
Hp1, Hp2	She walks between shelves look from distance, the little girl picks the first book she see. "The grandmother" keeps walking the girl holds the book and walks behind her grandmother. The girl sits on the bellows on the floor "grandmother " call her to sit on sofa and start to read the story to the girl. At this time the little girl points on images and she is a look not very interested, she looks to the other side of the library. The "grandmother " keeps reading and finish then the girl takes the book put it back then pick another one from different location without looking to the book. She looks familiar with the place. She give her "grandmother" the book and sit next to her this time "grandmother "tries to make the girl reading. She points with her finger on the words while the girl reading, the girl finish reading and put the book. She runs a way then goes back to same shelves and pulls book looks to cover put it back. She pulls another book show it to her "grandmother " talks to her then put it back. Pull book, give it to her

	<p>“grandmother " sit next to her and start to read. This time the “grandmother " asks questions about books, they finish and the girl put the book back. The girl pulls book show the cover to her " grandmother " put back, pull another one read the tittle " grandmother "take the book open it from middle and read it from the beginning then let the little girl read she spill the word to her and help her to read. They finish and the girl put the book back, they go to second floor “grandmother " get book after that they left.</p>
<p>Hp3, Hp4</p>	<p>"F" returns books and looks to bestseller shelves, she pulls book read the cover and put it on trolley with "M". "M" looks to shelves from distance then pulls book and put it back. "F" pulls book open it from middle and take it, "M" pulls book put it on the shelf and open the first page read then read from the back and go back again to the first page and read then put it back. "F" pulls book looks to the cover and the back of the book then take it. "F" pulls another book show the cover to "M" looks to the spine then give it to her she puts back. "M" walks to the send of shelves look from back, put his hand on the top of the books bend his head and look half pull, pull open first page and read then he looks to shelf while the book is open he keep flipping the book then take it. "F" takes book read back cover put it back then pull another read first page and take it. She keeps doing same thing with many books, read the cover. "M" comes to same location talk to her then goes to online catalogue. "F" looks to return book trolley and pull book read the first three pages then take it. She pulls another one read the cover then introduction and takes it. She keeps pulling the half of books and look to the covers then put them back. "M" goes to meet her and look to the same location pull book flip it fast and take it, goes to her show her the book and talk about it he said "it is very interesting" it seems he read about it in the catalogue. "F" takes book and keep look to same place. "M" walks to different location and look to shelves from distance walk no touch. "F" goes to another place pull many books sometimes she looks to the cover or read the first page. They both go to the catalogue "M" search and "F" looking, they talk, point on the screen. It seems they found something interesting. They go to shelves and she points on books and talk then she pull book from upper shelves show it to him and talk, he take it from her and put it in trolley. He sits and waiting for her at this time he looks return items pull book look to cover</p>

	and put it back. They left.
Hp5, Hp6	Each one of them look to different side of shelves then she move toward him they stand up looking to the books. She gets a call and he sits on chair while she finishes. She moves to "architecture" looks to the spine of the books then she pull big book from "art history" put it on a table and flip it point on images slowly and talk about them "M" is looking but not talking "F" is keep flipping and reading some pages. It seems that "M" is doesn't want anything from the library, he is a company. She put the book back and goes to talk to "M" while he looks to the shelves. He pull book flip it and put it back she going to search in a different place. He keep pulling many books flip them read one page sometimes and then put them back. Other time he just looks without touch. He moves to the sport section pull book open it from middle then go to first page read the introduction then put it back. It seems that he wants to pass time only. I lost "F" for while then she comes back with small piece of paper it looks she used the catalogue. She gives him the paper and they both sit on sofa for more than 10 minutes talking then they left without any books.
Hp7, Hp8, Hp9,	They were sitting on the table mum reading and the two girls listening. Hp8 points on the images and talk, mum is also pointing while she reading. She finishes reading then they go to the customer services to get 2CDs they got them before the observation.
Hp10, Hp11	They come to use the computer and booked hours, they move between the first and second floor looking for computer. They can't find one, they move between shelves talk it seems they have a specific hours to use the computer so they decided to go and come back again for their hours but I left before they come back.
Hp12, Hp13	They booked Internet hours but all the computers are busy so the left and come back again after 25 minutes and they sit to use the computer and they left.
Hp14, Hp15, Hp16, Hp17, Hp18, Hp19	The library arranges an event for Indian festival light; the mother goes and chooses 4 cds. They decide to join the activity H16 had a book give it to his mum to do some activity. They all sing then sit to listen to a story and participate in the telling story. The mum uses her mobile for long time then she get a book from her bag and start to read. She has 4 stories in her page it seems they get them before the observation. They left before the activity finish.

Hp20, Hp21, Hp22, Hp23	They join the event Hp22 sit and participate to do some activity with paper and scissors Hp23 plays on a horse and the mum sits next to her. Hp22 left the paper and doesn't want to join the activity any more she play on the horse. The dad just comes to the library Hp22 become excited to do the activity with her dad. They finish creating a card for her mum and show it to her. They finish the event and at this time mum talks to another women about her little girl and lunch. They all left without going to shelves or interacting with books.
Hp24, Hp25, Hp26	The mum goes directly to cds shelves and gets 3 cds. They all join the event and participate with other families specially the mum talks to another women next to her. Dad also makes conversation with different women while the girl plays around. The dad uses the computer for some times. Mum goes to return box and drop some books there. Another women with a boy talk to them. They all left together while they talking.
Hp27, Hp28	The mum sits on a sofa reading and browsing on her Ipad, the girl goes to cds shelves and choose one cd then shows it to her mum. The mum asks the girl "where did you bring this from" the girl shows the mum the place. Mum flips the cds while the girl looks to the covers pick one and give it to her mum. The mum also chooses one and shows it to the girl. They both go to second floor to home & technology section the mum looks to from distance from lower shelves to the upper one. Bend his head while she walks and moves to another side from the shelves she walks and looks to return items. Mum asks the girl to sit on chair because the girl interrupts her many times. She opens book on the shelves and start to read then open it from the middle read after that close it. She looks on the spine of the books, she pulls book from eye level shelves open it from the middle read then flip it fast put back. Pull another book see the cover and put it back, she did same thing with many books. She moves to Art & leisure she also keep pulling books look to cover and sometimes flip them and put them back. She goes back to Kids section the girl put the cd back and then they left.
Hp29, Hp30	"Grandmother" gets a story from book bins, they sit on a table and read it for the little girl after "Grandmother" finishes reading, the girl goes to play on the horse. "Grandmother " goes to books bins again flips stories and choose one show it to the girl from distance, the girl laughs so "grandmother " takes the book and chooses two different stories open

	<p>them from the middle, flips them and takes them all on the table. She goes back to get 2 more then sit on the table the girl comes and sit with her but she doesn't " grandmother " to read now. The girl plays around then she sits and "grandmother" starts to read and points with her finger on the images the girl keep flipping the pages and close the book. " grandmother" show her another book and ask her if she wants her to read it, the girl looks excited " grandmother " start to read in the middle of the story the girl goes to book bins pull story give it to " grandmother " to read it but she does the same thing close the story before it's finish. The girl opens book and show "grandmother" the images then "grandmother" start to read it for her. This time the girl listens to the end of the story then they walk between the shelves the girl point to some cartoons characters on the top of the shelves. "Grandmother" put all the stories back; the girl goes to Novel section looks and looks to the images on cover of the books. She gives it to her "grandmother", they sit and start to read it. In the middle of the story the girl goes to play around and "grandmother" put the book back. "Grandmother" uses her mobile while the girl plays, they left.</p>
<p>Hp31, Hp32</p>	<p>They enter the library together but each one search in a different locations but I can't find "F". "M" search in World languages he flips book in return items trolley. He walks and pulls book then open it and start to read. While hold this book, he pulls another book. "F" just comes and stand up next to him holding one book "M" gives her the two books she flip them and walk. "M" flips book on shelves and did same thing many times, he pulls book show it to "F" looks to the cover and take it. They both search in same location "F" looks to the covers and the spines "M" pulls book shows it to her talks together and she take it. "M" looks from lower to upper shelves and put his finger on the spine on the book. Both of them pull books flip them then put them back. "M" looks from distance "F" shows him the cover of one book he take it and goes to first floor talk to customers services. "F" sits on chair read one of the books. He comes back and gives her the book. He looks to shelves and pull book spends time reading the introduction then read the last page and put it back. They left.</p>
<p>Hp33, Hp34</p>	<p>She looks to her mobile and looks to shelves at same time and walks between shelves. She stops and pulls book from lower shelves then put it back and look to her mobile again she sits on the floor pulls book flip it</p>



	<p>and put back at this time the little girl plays around. Hp33 keeps look to her mobile and pulls books looks to the covers and put them back. She pulls book looks to the cover and check her mobile and take it, she stand up walk between shelves then she goes to books bins and flips books without pulling them. She pulls book read it then put it back. It seems she looks for a particular books because she keeps looking to her mobile all the time when she search. She uses the online catalogue then talks to a women in the customer services desk. She sits on the table call the girl read one book to her then put it back and left with one book.</p>
Hp35, Hp36	<p>She pulls book from books bins and sits on the floor to read it for the baby. The book has big images and the boy looks excited flipping pages and the mum keeps reading. While she sitting on the floor she pulls book looks to the cover and put it back and pulls another book and start to read. She put the book back, the boy crawl and pull book from his level the mum put the book back and take him for change. She comes back and pulls book and start to read while the boy plays around. Mum pulls book put it back then pulls another one with lots of colors and big images, she flips it for him but the boy plays with books on lower shelves. She looks to her mobile then pulls book shows it to him and flips it for him. She talks in her mobile at this time the boy flips the story and keeps pulling books. She pulls book and read it to him but the boy does not want so she put all the books back and left.</p>
Hp37, Hp38	<p>They go directly to "Fiction section" "M" pulls magazine and sits on a table to read it. "F" goes to recent returns items shelves pulls book looks to the cover and take it. She walks to a different location flips books on the shelves without pulling then she keeps walking. She pulls book looks to back cover then put it back, she pulls another one looks to cover and put it back. She pulls another one looks to the front page and take it, do the same things with another book. "M" puts the magazine back "F" uses the Computer to borrow the look to best seller shelves, they left</p>
Hp39, Hp40	<p>They enter the library and the boy asks the mum to play on the horse then they sit on the table play with puzzle. The girl plays on pillows after that they both left (don't touch or interact with books).</p>
Hp41, Hp42,	<p>The mum uses the online catalogue while the little girl chooses dvds. Hp42 brings two dvds and the mum puts them back then Hp42 goes to shelves pulls book and run after her mum. They go again back to shelves</p>

	<p>walk between them look to the books without touch then the mum uses the catalogue again. She goes back to shelves pulls books flip it and put it back. She keeps walking does the same things with two books, they both go to second floor walk then go to first floor again. They walk without touching mum sits on the floor looks to shelves then move to a different location sits on the floor pulls book flip it and take it. Mum pulls many books flip them put them back, she pulls book shows the girl page of this book and take it pulls another one then take it. They left with 3 books.</p>
<p>Hp43, Hp44, Hp45</p>	<p>They go directly to customer services to book Internet hours. They left because all the computers are busy but they come back at 10:00 they both sit on a sofa and wait. Hp43 walks between shelves then picks magazine and sit on a table to read it at this time Hp44 walks with the boy to make him stop crying. Then Hp44 sits on the computer and Hp43 sits on sofa next to her and wait then they both left.</p>
<p>Hp46, Hp47</p>	<p>The mum returns some books then goes to Kids section; the boy goes to Cds shelves. The mum comes to him and start to search with him she flips the Cds on the shelves and pulls 2 Cds then she changes her location pick another 2. The boy plays around while the mom keeps searching then pulls one cd look to the back of the CD and put it back, she pulls another one looks to the back and take it. She talks to the boy and asks him if he can finds train one?? He searches and looks to the images on the cover. She pulls book and give it to him then she pulls another two, the boy pulls one show it to mum but she says we already read this one before. She flips books on books bins and sees one book and says this book in wrong place then the boy pulls book and said we don't read this before, take it. He pulls another one but the mum says "it's hard for you". They have 6 books now. She asks him to sit and read book while she search for some books to her but he says no so they go together. They go to Fiction section she sits on her knee to look to lower shelves then move to other side. She uses online catalogue then goes back to shelves half pull looks to the cover and put it back. She did same thing with many books and sometimes pull them flips and put them back. The boy pulls book gives it to mum and asks her to take it but she put it back. She pulls book looks to back cover and take it pulls another one looks to back and put it back. She walks between shelves pulls books looks to back cover put them back. They left.</p>
<p>Hp48,</p>	<p>He returns books then both dad and son go to fiction section he pulls book</p>

<p>Hp49, Hp50</p>	<p>flip it and read some pages then put it back. Pulls another one read some pages and takes it, the boy plays around him. Half pull looks to the cover and put it back he did same thing with 4 books, he pulls another book looks to cover and back and take it. The boy goes to Kids section and bring book and shows it to dad, his dad take it flip it and give back to him. Dad walk and see the magazine on a table, he sits and read some pages from it then he goes to the shelves pull another magazine flip it read some pages. The boy goes and comes back with different book show it to dad and says "this is a new one" then goes to play with a girl. Dad keep reading the magazine looks to his watch and continue reading then put it back. He goes to Dvds section pulls one look to shelves then put it back, put his finger on the dvds walk pulls 2 dvds looks to the cover and put them back. He talks to a women next to him I realize after that she is his wife. The boy asks dad to go and take one cd then he asks dad to come and see the cds. The dad goes with him looks then goes back again to dvds and look from distance and talk to his wife the boy bring cd and take it at this time mum pulls a story for the boy and take it. They left with 3 books for dad, 1 book for the boy, 2 dvds and 1 book for the mum.</p>
<p>Hp51, Hp52,</p>	<p>They were sitting on sofa waiting to use the Internet; "M" holds small paper. They sit on the computer "M" searches and "F" looks they talking while searching, "F" texting on her. They try to find answers for some questions. They open a Word document on the screen and search on the Internet, copying some content from websites and paste it on the document. They read their answers and compare it with some websites "M" editing the whole answers and discuss together while "M" is editing. "F" uses her mobile for long time "M" keeps editing they finish and send it by email then they left.</p>
<p>Hp53, Hp54, Hp55, Hp56</p>	<p>I was busy since I saw them then I meet them at 11:51, Hp54 and Hp55 each one has 6 books from Kids section. At 11:50 them mum comes to library with Hp56, she returns some books then uses the catalogue Hp55 helps her little sister to find books but she did not get anyone. They both go to the mum while she using the catalogue then the girls go back to shelves Hp55 looks to the novels. Hp56 plays around Hp54 walks between Dvds and Cds shelves looking without touch. Hp55 shows Hp56 a book then put it back then each one of them search in a different location. Mum searches on Fiction section in the recent returns items then goes to the girl</p>

	talks to them. Hp56 comes with book then before they leaving, she runs to get book from novels shelves they all go to customer service desk then left.
Hp57, Hp58, Hp59, Hp60, Hp61	Hp57 and Hp58 sit on a table flipping a book about sport. The book has a lot of photos for basketball players, they flipping and talking about their names and when they start playing. The book has some information about players, they both holding the book Hp57 reading Hp58 pulls the book and read. They pointing on the images Hp57 pulls the book again to read Hp58 uses his mobile. Hp58 holds small paper and he stand up to goes to first floor Hp57 takes the book and goes to talk to a women sitting on a table reading book. It seems they come together, he shows her a small piece of paper then he sits to use the computer, he browses on the Internet. Both of them use the Internet and sit for a long time. At 11:00 I saw them again leaving the two boys with the women and another 2 boys. It seems they were searching individually in a different location.
Hp62, Hp63, Hp64, Hp65, Hp66, Hp67, Hp68	It seems they are in a kinder garden visit the teacher sits on the sofa talking to Hp64, Hp65 and Hp68 while they playing on the pillows. The teacher moves between the shelves pulls books looks to the covers then put them back. She already has 4 books in her hand, Hp67 gives her a book she flips it and takes it. Hp68 brings a Cd gives it to the teacher and she takes it. They left with 5 books and 1 Cd.
Hp69, H70,	They enter the library and go directly to second floor; they find a table to sit. She opens her Ipad and put her laptop on the table. "M" uses his mobile then they both left.
Hp71, Hp72	While the boy plays around the mum moves between book bins holding 3 books and looking for more. She picks book flip it and takes it then did the same thing with another 2. I lost them for a while then I found them in the second floor to Home& technology section searching in cooking shelves. The boy flips on of the stories on the floor mum pulls books flips them and put them back. She pulls one while she holding one then put them back. She walks and flips returned items pulls one flip it and take it. They left.
Hp73, Hp74	They sit on the sofa and mum read a book for him, she finish and read another one. The boy holds 2 books he flips one while the mum texting on

	<p>her mobile. The mum puts all the books back and the boy did same thing. She moves to second floor to use the Internet and the boy sits with her. They left.</p>
<p>Hp75, Hp76</p>	<p>The mum sits on the floor pulls books from book bins flips them and puts them back. The boy holds Cd; the mum pulls 5 books randomly then put them on her baby trolley. At this day the library organize an activity for the kids so the mum join them. They sit and listen to a story then sing together. She moves with the boy to second floor non-fiction section, pulls books flips them puts them back. She pulls books looks to the cover and takes it. They left.</p>
<p>Hp77, Hp78</p>	<p>The girl pulls book and walks then come back and pulls another one and put them on the floor, goes to play. Mum pulls books flips them put them back. The girl plays with big ball both of them join the activity and listen to a story. They left the library before the activity finish with no book.</p>
<p>Hp79, Hp80</p>	<p>He sits on a sofa next to book bins pulling books flipping them and put them back. He chooses 3 books and the girl pulls book shows it him and put it back. He goes to sit next other people and join the activity but the girl still pulls book gives it to him and goes to pulls another one. She shows her dad the book then goes to play. Dad opens one of the stories read it then put on a table next to him. The girl moves between shelves then she sits next to her dad, Actually the girl looks not interesting at all to the activity she keeps moving between shelves and flips Cds. the dad sits and watch the show then he walks to return items shelves and flips the cds . He talks to women then they left.</p>
<p>Hp81, Hp82</p>	<p>The mother searches in books bins pulls book flip it read some pages. She talks to women searches in same place, they both join the activity sit next to each other. They talk together then listen to a story at this time the boy goes to book bins pulls book and put it in his trolley. He pulls many books and makes a mess, the mum comes to tidies the mess. The mum takes him to sit and listen to the story telling in the activity. The boy listens and mum keeps talking to the women next to her. She does not want to participate with activity puts the boy on the sofa and goes to books bins. She chooses 7 books by looking to the covers only. She changes her location and chooses more books, she has about 12 books then talk to a women. She goes to customer services desk talks to the same women and leave together.</p>

Hp83, Hp84	The mum searches in the book bins flip books and talks to a women search in same place. The girl plays around then they both join the activity and sit to listen to the story. The mum talk to the same women sits next to her then she moves and sits on a table write on a paper while the girl play around. She talks to women in customers services then left without any book with the same women Hp81.
Hp85, Hp86	"Grandfather" sits on a sofa and the girl brings one book, one cd shows them to her "grandfather ". She goes to cds shelves flips them choose one shows it to her "grandfather", he asks her to put the book back and choose only cds. She puts the book back and brings another cd, shows it to her "grandfather" looks to the back cover and said, "oh it's a barby you can go and bring another one". She goes to shelves flips cds choose 2 then sits on the floor looks to lower shelves. She stands up looks to cds no touch, she moves to a different side of the shelves. She comes and tell her "grandfather" I can't find "Dora" I choose this one". He asks her which one you want now. She chooses 2 and put the other 2 back. He says go and tries to find "Dora" she goes and keeps flipping the cds then she comes back and said, "I can't find it". She goes to shelves again looks for long time then she comes to her "grandfather" and said "I found Dora but it's not the one that I want". "Grandfather" asks her "do you like this one?? She said yes". He reads the back covers for all the cds then he said "you already have this one", they talk Indian then she put all the cds back sit on a sofa to eat then left.
Hp87, Hp88	They are sitting on the sofa, mum reading and the girl listen. Mum finishes reading and asks the girl if she want to choose another one. The girl chooses one look to the cover give it to her mum to read it. She finishes then put the book next to the other one on the sofa and asks the girl to bring another story. The girl brings a story, mum reading but this time the girl plays around. The mum keeps reading, she finish it the girl goes to choose another book she is very excited about the cover of the store but the mum said it's too long go and bring different one!!!. The girl chooses another book gives it to her mum, the mum gets a call then said we have to leave now we can only read one book. She starts to read and the girl plays on pillows. She finishes it and put it next to another books on the sofa and left.
Hp89,	They go directly to second floor find a table; they all sit together talking

<p>Hp90, Hp91, Hp92, Hp93, Hp94, Hp95, Hp96, Hp97, Hp98</p>	<p>about getting some ideas. Hp92 talking and the other listening, he asks them about suggestions it seems they working on a project. They stop and watch a TV; one of them goes and walks between shelves looking to the books. They left together.</p>
<p>Hp99, Hp100 , Hp101 , Hp102</p>	<p>They were searching on shelves; the mum sits on her knees flipping books on the shelf. She pulls one book and flip it dad looks to the book in her hand. She pulls another one flip it then put it back. The boy searches on cds shelves and chooses 3 cds, he shows them to her mum and goes again to the shelves pulls one cd shows it to her mum and put it back. The mum has many books in her hand and keeps searching. She pulls book flips it then take it "she flips all the books before she takes them". She moves between different places and keeps looking, the boy pulls cd and shows it to her mum. The mum searches in return items shelf, she shows the boy book on the shelf but the boy pulls another one next to this book and take it. He goes to show her dad the book at this time mom chooses another book and take it. The dad was sitting on a table in a different place reading magazine, the boy read a page of the book to her dad loudly, and then mom comes to sit with them. She pulls the magazine from the dad and read it; they talk about something in the magazine. They stand up, dad puts the magazine back and they left.</p>
<p>Hp103 , Hp104</p>	<p>The boy gets a CD from kid section "grandfather" flips dvds on the shelf the boy comes and start to flips dvds then "grandfather" walks to kids section the boy follows him. They both search on the cds but they did not choose any one. They go back to dvds search in same place and talk, they choose 3 dvds and they left.</p>
<p>Hp105 , Hp106 , Hp107 ,</p>	<p>Hp106 sits on a sofa in kids section playing in her Ipad then at 10:20 Hp109 comes and sits with her after 3 minutes Hp105, Hp107 and Hp108 come they all sit together chatting. They play on cards guessing the words on them. Hp109 goes to magazines shelves and walks without touch then he comes back to his friends and joins their games. They move to second floor find table and sit to study and do some works together. I left and they</p>

Hp108 , Hp109	still working.
Hp110 , Hp111	The boy chooses book from book bins and asks the mum to read it. They sit on a table and mum start to read before she finishes the boy find a book on the table and asks his mum to read it. The boy flips the book and his mum texting on her mobile. They play puzzle then the boy goes to cds shelves and chooses one cd and give it to his mum but the mum still looking to her mobile. The boy walks to books bins and pulls book then sit on the table it looks he is more interested on the cover of the book more than the content. He goes to pull another book, sit on the table flip it then goes to play with pillows. Mum still looking to her mobile while the boy plays, he asks the mum to come and sit next to him. The mum chooses only one book to take it with them then they both left.
Hp112 , Hp113	The boy pulls book from shelf and shows it to his mum. The mum chooses 3 cds from cds the shelves at this time the boy pulls book and comes again to show it to her. She said, "You have to think what is the book about not only pulls them". He pulls book shows it to her mum; she chooses 4 books by looking to the cover. They sit on a sofa and start to his book after they finish they go to customer services to take the cds and the book. They left.
Hp114 , Hp115	The boy goes directly to cds shelves and chooses 3 cds. Mum flips books in books bins looking to the covers; she pulls one flip it from the back and take it. The boy pulls book and shows it to her mum but she says, "It's too long". He pulls another one show it to her this time she asks him to choose another book but he wants this book so she take it hold it in her hand and keeps searching. She pulls 2 books flips them and take them, she flips the boy's one read some pages and take it put in her bag. She keeps searching and flipping books on the book bins but sometimes she pulls them flips them and put them back. The boy plays and flips cds then goes to books bins pulls book show it to his mum and put it back, keeps playing. While the mum searching the boy choose a cd show it to her she says "this is for a baby" he goes to chooses another one but she also says "you already have this at home". She moves to dvds section looks to dvds from distance, walks to a different side then calls her son. They go to customer services to take the cds and the book. They left.
Hp116	Hp117 flips books in the book bins and pulls one shows it to her mum.



<p>, Hp117 , Hp118</p>	<p>Hp118 paly on the pillows, the mum sits on a sofa holding the girl's book. The two girls play together on the pillows, Hp117 sits next to her mum on the sofa and the mum start to read. She finishes and asks the girl to go and bring another one. The mum pulls 3 books and put them on the floor and opens them for the little girl. Hp117 chooses 2 books and sit with the mum on the sofa to read them. She finishes them and the girl goes to bring another one. The mum collects the book from the floor and put them back. The mum chooses book shows it to Hp117 and she takes it, the girl also chooses one book. They go to customer services to take the cds and the book. They left.</p>
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### Collected data in academic library

User's id	Description
Ha1, Ha2	They were searching before the observation, and have like assignment sheet Ha1 read the paper and Ha2 search's on the catalogue. They go to the shelves pointing on books, half pull, and look to the shelves from distances. Ha1 looks to the paper and pulls book read the cover and put it back. They both look to the shelves from distances and go back to the catalogue. They read the assignment sheet together and flip the paper, talk while they standing next to the catalogue. Ha2 searches on the catalogue and Ha1 looks to the screen and the paper. They go back to the shelves and they looked to the number of the section on the top. They looks to the spine of the books Ha2 pulls book from the middle, shows it the women it seems they found what they want. they talk together then left the library without any book
Ha3, Ha4	They search on the catalogue, one search and the other one standing and talking. They left without searching on the shelves.
Ha5, Ha6	Ha5 and Ha6 stand up on one of the tables in the library, searching on their personal laptop. They have a book with them. It appeared that they searched an eBook while reading and talking together. They ask a librarian for assistance, and then go together to the catalogue. The librarian searches and talk, discussing what she was doing with them. Then they go with her to the shelves, found a book and took it. They have a note that included some book titles. They both pointed at the book in the middle. Ha5 pulls a book out and take it. Ha6 pulls a book out then

	<p>returned it. He pulls a book from eye level, read the spine and returned it. Ha5 pulls a book out, flips through it, shows his friend some pages and continue to flip pages. Ha6 pulls a book down, looks at the spine and then the cover, and take it. Ha5 pulls a book down to look at the spine, then put it back, looking at books without pulling them down. They talk while searching. Ha6 pulls another book down, shows the cover to his friend and flips through it, points to some content and discuss it. Ha5 look to the shelves, from low to high. Ha6 continue reading the same book and look to the shelves. He sat on his knees, pulls another book down, read the cover and returned it. He repeats the action with a different book. Ha5 pulls a book down, shows it to his friend and returned it. They left the library.</p>
Ha7, Ha8	<p>One searched the catalogue and the other looked, but they took no notes, only talking and discussing. Ha7 looked to his mobile phone, comparing it with the online catalogue, then left the catalogue and used the mobile. He might have been searching for books on his mobile. They talked next to the catalogue and searched again. They looked to the mobile and searched again. They talked together and then left, without searching on the shelves.</p>
Ha9, Ha10	<p>Ha9 searches on online catalogue and the Ha10 looks then Ha9 is looking while Ha10 searching. They both taking note then Ha10 goes to shelves Ha10 looking to him from distances. Ha10 comes back to the catalogue and search. Ha10 goes back to shelves looking to eye level without pulling then Ha9 half pull book look to spine. Ha9 bend his head and look to spines of books, Ha9 keeps doing same things. Ha9 stand up on the catalogue then Ha9 pulls two books looks to cover then put them back. Ha10 goes to use the catalogue but someone was on it so Ha10 goes back to shelves and pulls book, looks to the cover put it back. Ha10 keeps doing same thing with many books then Ha9 walk looking to the eye level shelves without pulling. Ha10 half pull, pull put them back and look to Ha9 while searching. Ha9 pull book look to cover flip it put it back, they talk together and looking to shelves without touching. They go back to catalogue and Ha9 pointing on screen and talk they left without taking any book.</p>
Ha11, Ha12,	<p>Ha11 searches on the catalogue Ha12 watching then she goes to shelves touch books in upper shelves. Ha11 half pull then they both goes again to</p>

Ha13	the catalogue each one use different computer. A boyfriend come and stay with them without doing anything related to their search. Ha11 get a book while am observing Ha12. they left
Ha14, Ha15	Ha14 and Ha15 use the online catalogue. Ha14 searches and Ha15 writes notes. They both go to the shelves. Ha14 points to books without pulling them out. Ha15 reads the notes and pulls a book out to give to her friend. Ha14 flips through it quickly and reads some pages. Ha15 pulls another book out, flips through it and returns it. They walk and look at the shelves without touching them. Ha14 reads the note while moving to a different location. They both look from a distances. Ha15 points to a book in the upper shelves and looks at book spines. Ha14 sits on the floor to browse the lower shelf. She looks at the notes and books without touching them. Ha15 flips the pages of books on the shelves, and Ha14 pulls out a book, looks at the cover and puts it back. She keeps pulling books out, flipping the pages and putting them back. They talk together while searching. Ha15 takes the notepaper and moves between shelves without touching. Ha14 stands on a chair to look at the upper shelves. Ha15 pulls out a book, flips the pages, takes it out, pulls another book down, opens it and reads some pages. Ha14 points to some content in the book and talks. Ha15 returns the book. Ha15 continues pulling out book, flipping pages and returning them. Ha14 pulls a book out, flips the pages and takes it. They continue looking at shelves at the eye and upper level and talk together. They both return to the catalogue. Ha15 searches and Ha14 writes. They then return to the same section. They walk to a different section Ha14 points to books. Ha15 looks. I lost them for some time, and then located them again. They have five books. Ha15 puts all books on a chair and sits on the floor, pulling out books, flipping the pages and returning them
Ha16, Ha17	Each one search in a different catalogue they go to shelves walking between them. Ha16 sit on her knee and look to the spine of books, Ha17 pulls book from the middle shelves and shows it to Ha16 then she looks to shelves while she holding the book opened. She put it back, Ha16 pulls book put it back without flipping. Ha17 pulls, half pulls from lower shelf then stand up pulls book from middle shelf flip it put it back. Ha16 pulls book, put it in the floor and pulls another one flips it then put it back. Ha17 keep pulling books flip them and put them back Ha16 looks behind

	<p>shoulders. They both look to lower shelves. Ha16 pulls book put it in the floor without flip it then pull another one flip it and take it. They left with 4 books.</p>
Ha18, Ha19	<p>Ha18 pointing books without pulling Ha19 looks to eye level shelves flips books. They go to return books trolley and look to the books, they talk to the women working there. She advises them to go to different location Ha19 shows her something written in her hand then the women pull book and give it to Ha19. Ha19 pulls book flips it and put it back, Ha18 pulls book look to the spine then put it back. She does the same thing with three books and sometimes looks to first page. Ha19 does same thing Ha18 goes to catalogue again but she does not use it, she goes to shelves has a paper and she highlighting on it then shows Ha19 they talk together. Ha19 uses browsing machine while Ha18 using the catalogue. Ha19 gives her pen and Ha18 writes on paper some note, Ha19 goes back to same section and looks to lower shelf without pulling then moves to Ha18 and talk to her on the catalogue. They writing some suggestions for searching and then discuss together. they look to a place to work but they could not find an available table so they left</p>
Ha20, Ha21	<p>They already have 6 books before the observation. They use the catalogue Ha21 searches and Ha20 looks, they both talking. They using machine and at this time they reading cover page. They both left.</p>
Ha22, Ha23, Ha24, Ha25	<p>Each patron searched in a different location. Ha22 moves to her friend's section. Ha23 walks and looks at shelves, and sits on the floor. Ha22 sits next to her and pulls out three books, taking them without flipping through or opening them. They leave and return with two other girls, Ha24 and Ha25. They all go to the same section. Ha22 shows one of the girls the cover of the books. They talk in front of the shelves for some time, then leave.</p>
Ha26, Ha27	<p>Ha26 has a paper note and moves between sections. It appears that Ha27 does not want to search. She looks at her mobile. Ha26 puts her finger on books while looking to her paper note. She pulls books out, looking at the cover, and gives them to her friend to hold. She moves to different sections, looking at the note, pulling books from a lower shelf, looking to the first page, showing her friend and giving the book to her. Ha27 looks at the shelves. Ha26 pulls books from different locations, flip through them and gives them to her friend. She puts her finger on a book and</p>

	<p>pulls another from the shelf, puts it on the table, sees the first page, shows it to her friend and gives it to her. They go back to the first location. Ha26 takes a book, looks at the first page and gives it to her friend. She looks from a distance, checking the note. She bends her neck, pulls a book from a lower shelf, opens it at the beginning, sits on the floor, looks to the index, then opens it at the middle and returns it. Ha27 sit on a chair. Ha26 pulls a book from an eye-level shelf and returns it. They both leave.</p>
Ha28, Ha29	<p>Ha28 sits down on the floor and looks to books in the lower shelves and she pulls the book read the title and put it back. She left the library without take any book. Ha29 decides to stand up and looks to the books on the eye level and above. She looks to the shelves without touching any book. She left the library with her friend without taking any book except the two books which be taken before the observation.</p>
Ha30, Ha31	<p>Ha30 looks to the eye and upper level and have note that he took from the online catalogue. He pulls book from the middle shelf and read it from the middle and then put it back. He pulls another book from the upper shelf and flips very fast and put it in the floor. After that he pulls another one from the same shelf, sits down on the floor and flips the book and shows his friend some information in the book. They decided to take it and left the library. Ha31 sits down on the floor and looks to the lower shelves, pulls book and looks to the front cover then put it back. He pulls another book and flips very fast then put it back and took a different one, flips and discuss with his friend about it then takes it and left the library.</p>
Ha32, Ha33	<p>Ha32 is one of the two friends came to the library. Ha32 went directly to the require section and walked from the beginning of the section to the end looking to the eye level of the self without touch or pull any book. Then Ha32 stopped and took one book and put it in his hand without flipped or read it. After that he went to talk with his friend and assist him to find his require books by looking to his mobile and searching on the shelves. While this process he found book for himself and he took it without flipped it. Ha33 used the online catalogue and wrote down the note in his mobile. Ha33 talked to his friend and tried to search together. Ha33 looked to the spine of the book and compares it with the note on the mobile. Ha33 pulled one book flipped and put it back then Ha33 looked from the eye level shelf to the upper one and picked book from</p>

	the top shelf. He flipped very fast. they left the library with three book
Ha34, Ha35	Ha34 came to the library with her friend. She was sitting on the floor before the observation. Ha34 was reading some papers to Ha34 while he searched the shelves. They both discussed the books they needed. Ha34 stood up and looked to the book that Ha34 was holding and talking about. She sat on a chair and pulled the book from eye level. The book contained photos. She flipped through the book and showed Ha34, then closed it and put it on her lap. She again talked to Ha34 about his book, who read some information to her. She returned the book and picked another from the same shelf, flipping quickly from the middle. She returned it. Ha34 pulled a book from an upper shelf and read the first page, then showed Ha34 the title. He read some information, and illustrates an idea to her, before returning the book. He moved next to her and looked to her book, then looked to the shelves and again to his friend's book. They stopped for a while and discussed the information. He moved to the shelves on the other side, took out a book and opened it from the middle, showing Ha34. He quickly flipped through the book, stopping on some pages and reading the information to Ha35. He closed the book and talked to Ha35, then opened the book again, read it and returned it to the shelf. The pair left the library without a book.
Ha36, Ha37	Ha36 pulled out a book, looked at the cover page and put it back. She had a paper note; apparently she used an online catalogue. She pulled out another book, gave it to the boy without reading or flipping through it. She pulled out different books, flipped through them and returned them. She did the same with three different books. She looked to the shelves from low to high, pulled a book out and flipped through it, then returned it. She pulled out another book and gave it to the boy without flipping through it. Ha37 pointed at the books without pulling any out, then half pulled one out, looked at the cover page and returned it. He took the paper note from the girl, went to the online catalogue, searched it and returned to the shelves. He looked at the lower shelf, pulled out a book and held it. Then they left.

## Appendix B

### ***Application for approval under the Ethical Conduct in Human Research and Related Activities Regulations***



THE UNIVERSITY OF  
**WAIKATO**  
*Te Whare Wānanga o Waikato*

#### **Ethics Committee, Faculty of Computing and Mathematical Sciences**

Name: **Hayat Hamad Alqurashi** (principal investigators)

Department: **Computer Science**

Email address: **hayat-hhb@hotmail.com**

Phone number: **02102975450**

Mailing address:

**Rototuna, 23 Sexton Road  
Hamilton 3210  
NEW ZEALAND**

This is an application for approval of: (please tick as many as apply)

- Research project involving human participants
- Course/Paper which involves student projects that collect data from human participants
- Undergraduate student project which involves data collection from human participants
- Master's degree research
- PhD research
- PhD research proposal to move from Conditional to Full enrolment

Supervisor's name: (if applicable): Annika Hinze

Supervisor's approval (signature) \_\_\_\_\_

Project

Title:

**Collaborative and social interaction between group patrons in academic and public libraries**

Is this research associated with an external grant or funding?  Yes  
x No

- × I request approval for this research or related activity and attach all relevant documentation necessary for evaluation under the Ethical Conduct in Human Research and Related Activities Regulations.
- I am applying under section 10 of the Ethical Conduct in Human Research and Related Activities Regulations Large Random Sample Surveys and Similar Research Methodology and consequently there is no consent form in this application.
- × I am applying under section 11 of the Ethical Conduct in Human Research and Related Activities Regulations Field Research and consequently there is no consent form in this application.
- × I have read and complied with the Ethical Conduct in Human Research and Related Activities Regulations.



Principal Investigator's signature :

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**Ethics Committee Action**

Should this application be referred to another delegated University Ethics Committee?

Yes       No

Details: \_\_\_\_\_

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Does this application also require approval from an external body (e.g. Northern Y Regional Ethics Committee)? See Appendix 5.

Yes       No

Details: \_\_\_\_\_

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- Approved Convenor's signature
  - Approved with recommendations*
  - Request modifications* *Reviewer's signature*
  - Approved with modifications* *Reviewer's signature*
  - Forward to University committee Date: \_\_\_\_\_
- 

- Copy of approval letter to UNILink for research associated with external grants and contracts

***Application for Approval  
Outline of Research or Related  
Activity***



THE UNIVERSITY OF  
**WAIKATO**  
*Te Whare Wānanga o Waikato*

**Ethics Committee, Faculty of Computing and Mathematical Sciences**

*Note: add your project details to this document – do not delete any of the existing content*

**Details of Proposed Activity**

**1. Identify the project**

1.1 Title of Project

**Collaborative and social interaction between group patrons in  
academic and public libraries**

1.2 Researcher(s) name and contact information

***Hayat Hamad Alqurashi  
Computer Science  
hayat-hhb@hotmail.com***

***Rototuna, 23 Sexton Road  
Hamilton 3210  
NEW ZEALAND***

1.3 Supervisor's name and contact information (if relevant)

**Annika Hinze**

1.4 Anticipated date to begin data collection

**12 August 2013**

1.5 Does your application involve issues of health or disability with human participants? If so, please refer to the guidelines as to whether your application needs to be submitted to the Northern Y Regional Ethics Committee.

**The application does not involve issues of health or disability with human participants.**

## **2. Describe the research or related activity**

2.1 Briefly outline what the project is about including your goals and anticipated benefits. Include links with a research programme, if relevant.

**This project is about exploring information-seeking processes of group users in order to gain insights into their book selection approaches, and to obtain some details about skill-searching techniques.**

**The data is going to be used to examine patron's characteristics and analyses their group collaboration and communication. The paper aims to presents the findings of observations of group collaboration in academic and public libraries, and draw comparisons about the effectiveness of the search techniques employed by different users.**

2.2 Briefly outline your methods.

**The study will observed users from a distance without personally approaching or interviewing them.**

2.3 Describe plans to give participants information about the goals of the research or related activity.

**The study aims to observe participant from a distance which means that participant will know nothing about the study. Therefore the participants will not**

**receive any information about the study as they should be unaware that the study is happening.**

- 2.4 Identify the expected outputs of this research or related activity (e.g., reports, publications, presentations).

**The study is going to be a part of a Master qualification and the researcher plan to publish the results in working papers, academic conferences and journals. The results will be presented at talks at these conferences or during visits to other universities. The results of the research will be made available in summarized form to potential funding bodies. All publication and presentation of the results will be done in anonymized form.**

- 2.5 Identify who is likely to see or hear reports or presentations arising from this research or related activity.

**Reports is planned as described in section 2.4. Expected readers and listeners are national and international researchers and funding bodies.**

- 2.6 Identify the physical location(s) for the research or related activity, the group or community to which your potential participants belong, and any private data or documents you will seek to access. Describe how you have access to the site, participants and data/documents. Identify how you obtain(ed) permission from relevant authorities/gatekeepers if appropriate and any conditions associated with access.

**The observation will be conducted in New Zealand. Participants will be observed in Hamilton public library and Waikato University library. No private data or document will be collected.**

### **3. Obtain participants' informed consent without coercion**

- 3.1 Describe how you will select participants (e.g., special criteria or characteristics) and how many will be involved.

**Anyone in the public and University library can be a participant. Am focusing on group users only. The study is planned to have 70 to 100 participants.**

- 3.2 State clearly whether this is an application under section 10 of the Ethical Conduct in Human Research and Related Activities Regulations: Large Random Sample Surveys.

**The application is not under section 10 of the Ethical Conduct in Human Research and Related Activities Regulations**

3.3 Describe how you will invite them to participate.

**Participant will be observed from afar in the library (at the public and University library).**

3.4 Show how you provide prospective participants with all information relevant to their decision to participate. Attach your participant information sheet, cover letter, or introduction script. See document on informed consent for recommended content. Information should include, but is not limited to:

- what you will ask them to do;
- how to refuse to answer any particular question, or withdraw any information they have provided at any time before completion of data collection;
- how and when to ask any further questions about the study or get more information.
- the form in which the findings will be disseminated and how participants can access a summary of the findings from the study when it is concluded.

**There is no direct interaction between participants and the researcher.**

3.5 Describe how you get their consent. (Attach a consent form if you use one).

**There is no direct interaction will be between participants and the researcher. This is an application under section 11 of the Ethical Conduct in Human Research and Related Activities Regulations Field Research and consequently there is no consent form in this application. The observation will be in a public space without any interaction or interference form the researcher.**

3.6 Explain incentives and/or compulsion for participants to be involved in this study, including monetary payment, prizes, goods, services, or favours, either directly or indirectly.

**No incentives will be used.**

#### **4. Minimise deception**

If your research or related activity involves deception – this includes incomplete information to participants -- explain the rationale. Describe how and when you will provide full information or reveal the complete truth about the research or related activity including reasons for the deception.

**The research does not involve deception.**

## 5. Respect privacy and confidentiality

5.1 Explain how any publications and/or reports will have the participants' consent.

**Publications and reports will not contain any personal data of the participants, and as this is an application under section 11 no consent form will be required for this study.**

5.2 Explain how you will protect participants' identities (or why you will not).

**No personal details will be recorded.**

5.3 Describe who will have access to the information/data collected from participants. Explain how you will protect or secure confidential information.

**Data collected by the researcher by observation will be kept as paper records and as electronic summaries. The collected data is anonymous and therefore does not need specific protection. All data will be kept for 5 years in the FCMS data archive.**

## 6. Minimise harm to participants

'Harm' includes pain, stress, emotional distress, fatigue, embarrassment and exploitation.

6.1 Where participants risk change from participating in this research or related activity compared to their daily lives, identify that risk and explain how your procedures minimize the consequences.

**There is no risk of harm for the participants.**

6.2 Describe any way you are associated with participants that might influence the ethical appropriateness of you conducting this research or related activity – either favourably (e.g., same language or culture) or unfavourably (e.g., dependent relationships such as employer/employee, supervisor/worker, lecturer/student). As appropriate, describe the steps you will take to protect the participants.

**There is no direct relationships going to be exist between participants and the researcher**

6.3 Describe any possible conflicts of interest and explain how you will protect participants' interests and maintain your objectivity.

**There is no conflict of interest.**

## **7. Exercise social and cultural sensitivity**

- 7.1 Identify any areas in your research or related activity that are potentially sensitive, especially from participants' perspectives. Explain what you do to ensure your research or related activity procedures are sensitive (unlikely to be insensitive). Demonstrate familiarity with the culture as appropriate.

**No areas of the research are identified as being particularly sensitive to the participants.**

- 7.2 If the participants as a group differ from the researcher in ways relevant to the research or related activity, describe your procedures to ensure the research or related activity is culturally safe and non offensive for the participants.

**The research is not offensive or culturally unsafe.**



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12 August 2013

Hayat Hamad Alqurashi  
C/- Department of Computer Science  
THE UNIVERSITY OF WAIKATO

Dear Hayat

**Request for approval to conduct a research study by observing human participants**

I have considered your request to conduct an observation survey for your research project *Collaboration and social interaction between groups of patrons in academic and public libraries* for your MSc research.

The study is evaluating information-seeking processes of group users for the purpose of drawing comparisons about the effectiveness of search techniques employed by different users.

As this is strictly an observation study from a distance, with no personal contact or approach to users in public libraries, no personal details of participants will be collected, therefore publications and reported results will not contain any names or any other identifying characteristics.

The procedure described in your request is acceptable.

The research participants' information sheet and consent form, meet the requirements of the University's human research ethics policies and procedures.

Yours sincerely,



**Mike Mayo**  
Human Research Ethics Committee  
School of Computing and Mathematical Sciences