

MASTER'S THESIS IN LIBRARY AND INFORMATION SCIENCE
SWEDISH SCHOOL OF LIBRARY AND INFORMATION SCIENCE
2016:1

Developing a theory of open access: a grounded theory based literature review

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Swedish title: Att utveckla en teori om open access: en litteraturstudie baserad på grundad teori

English title: Developing a theory of open access: a grounded theory based literature review

Completed: 2016

Author: Kent-Inge Andersson

Abstract: The thesis presents a conceptual literature review of the subject of open access as it is reflected in literature relevant to digital library research. An approach to the grounded theory method specifically created for the purpose of performing a literature review is applied to 70 articles and conference proceedings found in the databases LISA and LISTA. Through the coding of the literature five categories that conceptually order the subject of open access emerged; *Open Access*, *Authors*, *Scholarly Communication*, *Libraries and Librarians*, and *Developing and Transitional Countries*. The conceptual relations of the categories are discussed in the presentation of the categories. The emerged theory is then validated through a review of earlier literature, which focused on literature reviews on open access. A model of the emerged theory with explanatory narratives are then presented in the concluding chapter.

Keywords: open access publishing, grounded theory, literature review, digital libraries, library and information science

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1 Introduction

Nguyen & Chowdhury (2013) featured in an article a knowledge map of the research being conducted in the field of digital libraries. In the knowledge map, the entire field of digital library research between 1990 and 2010 were semantically mapped and found to contain 21 core topics and 1015 subtopics. One of the core topics was Access, in which open access was included as a sub-topic.

The definition of open access was penned down in 2002 in the *Budapest Open Access Initiative* (BOAI) declaration:

“By "open access" to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited“ (BOAI, 2002).

This thesis, inspired by the notion of an exploration of the field of digital libraries, wishes to expand on the sub-topic of open access. Specifically, the thesis wishes to explore how the subject of open access is reflected conceptually in recent literature. The thesis will take an exploratory approach to how open access as a research subject is reflected in digital library research, and will try to discover the meaning, manifestations and purpose of open access as presented by the research in the field. This will be done by approaching the subject with the grounded theory method suggested by Wolfswinkel *et al.* (2013). Their approach uses the systematic procedures and rigorousness found in grounded theory to create a literature review that reflects the literature only through the data that it contains. The idea is that this exploration will, where Nguyen & Chowdhury (2013) created a semantic map of the entire field of digital library research, rather than a world map, create a traveller’s guide to the meanings and concepts of open access as it is discussed in literature relevant to digital library research.

The potential of and hopes for the open access movement that sprung from the definition of the term in the BOAI statement, were that through new technologies, such as the birth of the web, in harmony with the age old traditions of scholars readily providing and sharing research among peers, could alter the current scholarly communication landscape so that research and scholarship could better serve the common good as well as facilitating the continued building of new and better knowledge through free and unrestricted access to the world community of researchers. This thesis will examine how these hopes are resonating in the current literature of library and information science, with a special focus on literature relevant for the niche field of digital library research. A literature review that focuses on the meaning of open

access, the relationships between the ideas that it represents, and the concepts relevant to it can provide an interesting and fruitful perspective on the subject.

1.1 Topic

In this thesis the author explores how open access as a subject for research is reflected in the field of digital library research. The material that are used to meet this end is literature found in scholarly databases that publish scholarly articles in the field of library and information science, and in two major scholarly journals that specifically target digital library research with their publication. This thesis will conduct a qualitative analysis of the meaning, manifestation, and purpose of open access as it is reflected in scholarly articles published in the two databases *Library and Information Science Abstracts* (LISA) and *Library Information Science & Technology Abstracts* (LISTA), and the two scholarly journals *Ariadne* and *D-Lib Magazine* between the years 2010 and 2015. Approaching the material using the grounded theory method will produce an intimate exploration of the articles found in the outlets, and is hoped to be able to discover relationships between ideas and concepts found in the literature that reflect the subject of open access.

1.2 Motivation

Although the subject of open access have been processed in various literature reviews in different research fields, a literature review of the subject has to the knowledge of the author never been approached by the grounded theory method in the niche field of digital library research. This novel way of conducting a literature review could potentially produce a unique literature review with potential new ways of presenting the subject research. The research now conducted in the field is assumed to be central to how the research field will perceive and discuss open access in the future. This thesis wish to conceptualise this discussion to support and enable further discussion by providing a theory of what open access means in the context of digital library research through a grounded theory literature review.

A secondary motivation is that the author wishes to gain familiarity with the literature behind and the method of grounded theory. The author is intrigued with the systematic approach to qualitative data collection and analysis, and wishes to gather experience and knowledge about the method.

1.3 Scope

The material gathered for the grounded theory are scholarly articles published between the years 2010 and 2015, disseminated through the databases LISA and LISTA and the two journals D-Lib Magazine and Ariadne. The number of articles included in the

analysis is determined by issues pertaining to the data collection phase and practical considerations regarding the choice of method.

1.4 Aim

The aim of this thesis is to produce a theory that explains how open access is reflected in digital library research through a close examination of recently published articles in the field that discusses the topic of open access or other related topics that projects the ideas and concepts underpinning the open access movement. This is to be able to create a description of how open access as a concept is discussed and understood currently in digital library research. The thesis also aims to identify subjects that are discussed in direct relationship to open access, so that the thesis can work as a tool for future researchers and students who wish to navigate the topic.

1.5 Research question

Main research question:

- 1 *How is the subject of open access reflected in the literature published in the field of digital library research?*

Additional research question:

- 2 *In what contexts is the subject of open access discussed in digital library research literature, meaning; what subjects are discussed in relation to open access and how do they relate to each other and open access?*

1.6 Delimitation

This thesis is concerned with how the discussion about open access is carried out in the field of library and information science with special regard to digital library research, and how this discussion is reflecting how the researchers in the field are building the meaning and purpose of open access. The databases and specific journals were selected and searched in the research process because of their focus on this research area. The included literature was published between 2010 and 2015 as a way to capture the recent literature without overreaching the required workload of the analysis.

1.7 Outline of the thesis

Below the reader will find an outline that will detail the structure of the thesis. This follows recommendations from the grounded theory literature, as the reader might be

unprepared for the unusual structure that a grounded theory requires (Gibson & Hartman 2014).

Chapter 2 will explain the methodological procedures of grounded theory as well as briefly describe the background and traditions that has shaped the method. How grounded theory can be used to perform a systematic and rigorous literature review will be the main focus of the chapter, where the rules of conduct on how to collect relevant literature and how to analyse the data are described in detail. The coding process is illustrated by examples and samples from the different levels of coding. Alternative methodologies that could have been employed are stated, and why the authors choose to continue with grounded theory.

Chapter 3 presents and describes the core-category and the categories with their sub-categories, properties, and dimensions, and the relationships between them, which emerged and were identified through the constant comparison of concept identified by the grounded theory methodology described in chapter 2. In this chapter the author uses italics to try avoid confusion regarding whether it is the author or the data that are stating something in the text. Italics indicates that it is the core-categories and categories and their relationships that emerged through the coding process of the grounded theory method that is being presented. Italics highlights that this is when the thesis is theorising. This theorising is also lifted through figures that are included in the end of each section in which new relational statements have been made which also aims to illustrate the thought process behind the creation of the categories. Non-italic text indicates the presentation of the substantive data analysed in the coding process of the grounded theory, which is the data that allowed, through the act of constant comparison, the grounded theory to emerge through and only through the data. Traditional referencing will be used when factual or controversial statements are made so that the reader can follow them to their source, but will be avoided otherwise as this would make the reading of the thesis tiresome and cluttered as these statements are often the result of the comparison of several similar concepts found in various excerpts. It is important to note that a grounded theory emerges only from the data, and that the data for this thesis are the excerpts, as described in chapter 2, of which the author of this thesis claim no authorship.

Chapter 4 is at the same time a discussion of the analysis and a review of earlier literature. The relocation of the review of earlier literature from its traditional placement in the beginning of a thesis to after the analysis was to prevent and avoid any preconceived ideas or notions that could influence the coding phase as informed by methodological consideration stated in chapter 2. It is important regarding the validity of a grounded theory, namely regarding the validation criteria *fit* and *workability*, that the theory emerges from, and only from, the data. This affects how the review of earlier literature functions in the research context that grounded theory as a method is applied in. In grounded theory, the review of earlier literature can be used in different ways, and the proper way of where to place, and even if to use it, is up for debate between the different scholarly voices invested in the method. The review of earlier literature in this thesis will aim to test the *relevance* and *modifiability* of the grounded theory presented

in the analysis in chapter 3 by focusing mainly on literature reviews on the subject of open access from a library and information science perspective and comparing them to the theory described and presented in chapter 3.

Chapter 5 concludes the thesis with the presentation of the grounded theory as it emerged in the analysis. The relationship between the core-category and the categories are highlighted through deriving the theoretical insights found in the figures of chapter 3, and are illustrated through descriptive narratives that aims to answer the research questions stated in chapter 1. The limitations of the thesis and suggestions for further research are presented, and a conclusion is stated.

1.8 Notes on terminology

While this thesis will make use of terminology that can mean many things in many different contexts, it is important to note that the definitions are only included as they are presented by the data. This is because of the nature of the grounded theory approach chosen for this literature review, where the meanings of terms must come from the data and only from the data. The definitions of open access and scholarly communication, for instance, can therefore seem unusual or in other ways different from what a reader is prepared for. The terms are presented as they are inducted by the analysis, and any definition should be seen as a reflection of the data the analysis has been applied to. For an authoritative terminology, Peter Suber's (2012) book *Open Access* is recommended. The book has been available as open access since 2013.

2 Methodology

To answer the research questions a literature review will be performed utilising the rigorousness and systematic approach found in the grounded theory method. The thesis will in this chapter establish what grounded theory is and how it can be used to perform a systematic and rigorous literature review

2.1 Grounded theory: a brief background

Since grounded theory originated in 1967 with the publication *The Discovery of Grounded Theory: strategies for qualitative research* (Glaser & Strauss 1967), many different streams of the method have emerged which all differ in approach and application. What it is, is not, and what it should be, have been and is still debated among grounded theorists. The debate includes argument from various actors, spanning from the originators of the original method to the more recent constructivist approaches to uncover theories from data (see for example Charmaz 2014; Gibson & Hartman 2013; Glaser 1974; Glaser & Strauss 1967; Strauss & Corbin 1998). The author of this thesis does not wish or claim to be a part of this debate, but when using grounded theory as a research method it is important to state which stream of grounded theory is being used so that it is clear which tradition the research is building on. In fact, previous authors have recommended novice grounded theorists to just chose one of the many ways and just do it (Glaser, 1974). After all, the main differences in the Glaserian and Strausserian streams of grounded theory is found in the recommended practical procedures and terminology, not in their epistemological or ontological assumptions (Mansourian 2006).

2.2 Grounded theory as a systematic and rigorous literature review

The grounded theory of this thesis will be discovered by following an approach to grounded theory presented by Wolfswinkel *et al.* (2013). Their approach were intended to be employed in information system research as a way to generate more and better literature reviews to the benefit of their field. The approach is based on how Strauss and Corbin (1990, 1998) discussed grounded theory. Strauss and Corbin's (1990, 1998) take on the grounded theory method is deliberately precise, and the explicit reasoning behind the publishing of their books was for grounded theory to reach a broader scope of potential adopters than earlier iterations of the method had through the creation of a clear cut path of doing grounded theory. This, they argue, would ease the introduction to the method for the novice researcher. The method has distinct steps of proper conduct and is therefore suitable also for the novice grounded theorist (Gibson & Hartman 2013; Strauss & Corbin 1998).

It might be important to state that Strauss and Corbin's stream of grounded theory has been criticised for being too formulaic (Charmaz 2014; Gibson & Hartman 2013). Although this might be the case, this thesis will consider this formulaic process as a strength, as the method makes possible the goals of achieving a transparent, replicable, and rigorous qualitative literature review.

In Wolfswinkel *et al.* (2013), the merits of using grounded theory to conduct a literature review are discussed. They see grounded theory as a way to make possible more optimal research outcomes than traditionally performed literature reviews as the presented findings emerges only through the data. The traditions of grounding the theory in and only in the data and the extensive note taking, known as memoing, produces a systematic approach and rigorous work-progress for the creation of a literature review (Wolfswinkel *et al.* 2013). In addition, Glaser (1974) mentions that the coding process might be better performed when it is applied to other researchers' material, as this provides a natural distance to the research that has been done and the concepts can rise more naturally and without bias.

In the article by Wolfswinkel *et al.* (2013), they present an approach to the method of the literature review in a way that utilises the inductive nature of the grounded theory method which allow the concepts to be discovered and coded through a systematic reading of the literature. Their method consists of five stages: *define*, *search*, *select*, *analyse*, and *present*. These steps are outlined in Table 1 below and adapted slightly for the purpose of the thesis.

1. DEFINE
1.1 Define the criteria for inclusion/exclusion
1.2 Identify the fields of research
1.3 Determine the appropriate sources
1.4 Decide on the specific search terms
2. SEARCH
2.1 Search for the relevant literature
3. SELECT
3.1 Refine the sample
4. ANALYSE
4.1 Open coding
4.2 Axial coding
4.3 Selective coding
5. PRESENT
5.1 Represent and structure the content
5.2 Structure the thesis

Table 1. Steps of a grounded theory literature review (adapted from Wolfswinkel *et al.* 2013)

2.3 Step one: Define

The articles considered for inclusion in the analysis must regard open access from a viewpoint relevant to digital library research. As literature not relevant to digital library research will be excluded, this includes literature that approaches open access from other research fields than library and information science. The articles must consider open access either as the primary subject area of research or at least be a necessary condition for the subject being studied. The articles must be published in the form of a scholarly article or as a conference proceeding.

For exclusion criteria, articles written in other languages than English were excluded because of the author's language limitations. Articles that mainly discussed technical issues and solutions in relation to open access were excluded due to the nature of the research in the thesis being the exploration of the purpose and meaning of open access to digital library research. While technical articles do touch upon experienced issues of open access, the author noticed that scholarly articles which did not focus on technical issues focused on the same issues as those that did, although more conceptually than practically. The criteria is summarised below in Table 2.

Inclusion	Exclusion
Relevant to digital library research	Not written in English
Journal articles or conference proceedings	Articles focusing on technical issues
Discusses open access in a significant way	News items and personal opinion pieces
Published between 2010 and 2015	

Table 2. Inclusion and exclusion criteria of data collection.

Theoretical sampling is a qualitative approach to the sampling process, with the goal of finding the most suitable sources which could further develop the emerging theory through identification and elaboration of the categories, properties and dimensions that are derived from the data. Theoretical sampling is to jointly collect, code, and analyse data, and to decide where to go next to find more data that can add to the theory that is surfacing through this process (Gibson & Hartman 2014; Glaser & Strauss 1990, 1998).

For the data collection in this thesis, theoretical sampling means the selection of proper outlets for the collection of relevant literature. Two central library and information science focused reference databases were chosen for the data collection process; LISA hosted by ProQuest, and LISTA hosted by EBESCO. LISA indexes, besides 488 titles of a wide range of material such as scholarly journals and conference papers and proceedings in the library and information science sphere, crucial digital library scholarly journals and magazines such as *D-LIB Magazine* and *Ariadne*. This makes it a suitable choice as a data collection point for the thesis. Also, in the selection policy found in the LibGuide for LISA, there is an aspiration for international diversity regarding authorship which means an international aspect to the data collected might be possible.

LISTA indexes 908 titles of a wide range of resources ranging from monographs to scholarly and technical journals as well as professional magazines. LISTA also indexes D-LIB Magazine and Ariadne. Any differences in the coverage and indexing of the two magazines should therefore work in tandem for the purpose of the literature review.

After the selection of proper outlets it was time to decide upon the search terms which would be used for searching the databases. The search terms used were “*open access*” and “*digital librar**”. “*open access*” was included in the search as a phrase to avoid retrieving articles that included any phrase that contained open or access as separate subject terms. Of course, “*open access*” as a subject term forces the search to include only articles that concerns open access specifically. “*digital librar**” were also searched as a subject term and includes truncation so that all phrases starting with the search term would be included in the results. This assumed to include subject terms such as *digital library*, *digital libraries* and *digital librarianship*. The search term were used to force the retrieved results to include only articles which are taking in consideration digital libraries.

2.4 Step two: Search

Wolfswinkel *et al.*'s (2013) second step is searching through the selected sources. This step is iterative, and contains sorting through duplicates as well as articles that makes the researcher re-evaluate earlier set samplings and criteria, thus revisiting the first step to make it either broader or narrower. The duplicates was in the individual searches adequately handled by respective database, but as scholarly articles could come up as a search result in both databases, some of the duplicates was removed manually.

As both D-LIB Magazine and Ariadne have been crucial parts in the shaping of digital library research since the inception of the field, specific searches for the subject term “*open access*” were performed when searched together with the publication titles in both databases, leaving out the subject term “*digital librar**” as this was assumed to be irrelevant due to the nature of the journals.

2.5 Step three: Select

The third step of Wolfswinkel *et al.*'s (2013) method is the selection of the texts to be included in the literature review. This step begins with excluding those articles that does not fit the criteria of inclusion that has been set up in step one. The inclusion of articles were decided from reading abstracts, titles, and, if needed, scanning of the main texts of the articles. The reading conducted in this way will then again be checked against the inclusion and exclusion criteria stated in *Table 2*.

The searches using the subject terms *open access* and *digital librar**, retrieved 46 items in LISA and 63 items in LISTA. The searches for the subject term *open access* in the

publications *Ariadne* and *D-Lib Magazine* retrieved 27 items in LISA and 41 items in LISTA. This results in a total of 177 retrieved hits. A total of 15 duplicates were removed which resulted in a total of 162 unique journal articles and conference proceedings. The remaining items were then checked against the inclusion and exclusion criteria. After reading and rereading the abstracts and keywords of the articles 113 articles were selected to be included in the analysis. During the initial phase of the analysis, several more articles were removed as they provided little theoretical insight or after closer scrutiny did not fit the inclusion criteria. This resulted in a final collection of 70 articles that make up the body of literature that allowed the analysis.

To illustrate the width of the selection of articles, the reader can find in *Appendix A* the specification of the journals, magazines and conferences in which the articles selected for the analysis were published. Alongside the titles of the outlets the number of articles selected for the analysis in each journal, magazine or conference is stated. Table 3 below further illustrates the width of the selection through the specification of the types of items included for the analysis, according to the stated methodology in each item, along with the number included of each type.

Type of article	#
Bibliometric analysis	1
Case study	16
Co-word analysis	1
Conference proceedings	4
Cross-sectional study	1
Exploratory study	1
Interviews	1
Literature review	9
Mixed method: focus group and questionnaires	1
Mixed method: literature review and survey	1
Position paper	1
Research report	31
Survey	3
Web analysis	1

Table 3. Specification of types of articles.

2.6 Step four: Analysis

The analysis of data in grounded theory is an iterative, inductive, and interactive process, where the data collection is in a constant relationship to the analysis. This results in a research process in which the data is analysed to generate concepts in a constant stream as a way to suggest further data collection which in turn makes way to more analysis, and so on, until all concepts and categories reaches saturation and the

theory can emerge (Gibson & Hartman 2014). This analysis has been described in different ways in the different streams of grounded theory, and below the process used for this thesis will be described in more detail, with samples and examples of how the coding process were actualised in the thesis as an attempt to make the process clearer for the reader.

The analysis of the articles resulted in the emergence of a theory of how open access is discussed in digital library research consisting of one core-category and several categories and the relationships between them. The process that allowed this emergence are explained, described and outlined below and accompanied with samples and examples in section 2.6.1. The articles used for the coding which allowed the core-category and the categories to emerge are mapped in the coding map of Appendix B along with the name(s) of the author(s) and year of publication. This coding map is for the reader to be able to navigate to the sources of the substantive data used for the emergence of the grounded theory.

2.6.1 Coding

After the two steps of searching and selection have been performed to satisfaction, meaning that a significant corpus of papers have been identified and selected, the process of coding begins. This is Wolfswinkel *et al.*'s (2013) fourth step, which is to analyse the data, and it is here that grounded theory really show its value in it being used to systematically and rigorously conduct a literature review. Throughout the coding process the grounded theorist engages in a building process where data goes from facts to a theory through the constant comparative method, where instances of data are compared to other instances and similarities and divergences are identified to uncover boundaries of a certain concept and to put it in a possible context with other similar concepts (Gibson & Hartman 2014; Glaser & Strauss 1964).

There are three stages of coding; open, axial, and selective. Although the three stages of coding are performed in a parallel fashion, open coding is the first type of coding that must be employed. In open coding the data collected is approached and thoroughly read and reread, so that ideas about what is going on in the data starts to emerge. The labelling of these ideas are called concepts. The concept in a grounded theory is supposed to say something about the data that it stands for in a suitable and descriptive way (Gibson & Hartman 2013; Strauss and Corbin 1998; Wolfswinkel *et al.* 2013). These concepts can then be grouped with other similar concepts. They together, as a group, then start to form categories, which is a further step up on the conceptualisation ladder (Glaser & Strauss 1967).

In the grounded theory method employed for this thesis, open coding is done by the reading and rereading of the literature line-by-line. From these readings, *excerpts* will be identified, which are passages that appear to be relevant to the research questions stated above (Wolfswinkel *et al.* 2013). Then, from the reading and rereading of these excerpts *concepts* will start to appear, remembering that these concepts should be considered as labels that in some way captures and/or explains the data. As stated

above, these concepts will then be merged into categories, but also divided into subcategories if required (Wolfswinkel *et al.* 2013). Gibson & Hartman (2013) describes more thoroughly this line-by-line technique, and their suggestion will be used for the open coding conducted for this thesis. Glaser (1978) recognises that the process is time-consuming and painstaking, but also that the categories emerge and reach saturation much quicker than with other approaches, and that the *theoretical sensitivity* is enhanced.

The open coding according to the line-by-line reading process were by the author of this thesis applied to ten randomly selected articles at a time, which the author termed a *batch*. The excerpts identified in these articles were copied to a separate .txt-file bearing the articles titles respectively. In these .txt-files, concepts were identified and associated with the excerpts that had produced them through proximity. A sample of how an excerpt were coded during open coding can be found in Table 4 below.

Sample excerpt	Sample of emerging concepts in open coding
<p>“Scholars understand that the current publication models are limiting their readership, but despite recent evidence to the contrary, they still fear that Open Access publishing will negatively affect the impact of their work and therefore they seem reluctant to move to OA. However, a growing number of scholars are becoming aware of both the benefits and drawbacks of Open Access and are seriously considering their options” (Georgiou & Tsakonas 2010, pp. 244).</p>	<ul style="list-style-type: none"> • Scholars have an understanding of how traditional publishing model are limiting their readership. • Scholars' fear of open access publishing is due to anxiety regarding their research impact. • The fear of decreased impact results in a reluctance of engaging with open access. • Scholars have an increasing awareness of the benefits and drawbacks of open access. • Increased awareness results in an increased interest in open access publishing.

Table 4. Sample of open coding with emerging concepts.

After the process had been completed on ten articles, the concepts were grouped in a single .txt-file that were named according to the batch number the articles had been assigned to. These batches allowed an ordered overview of the accumulated concepts. These groupings of concepts in the batch-.txt-files were used to start sketching potential categories and sub-categories, but the categories were still tied to respective article. This process continued until two batches had been completed, after which the concepts and fledgeling categories were transported to another .txt-file called *Categories B# + B#*, where # stands for the number assigned to the batches included in the categories file. Here the categories of individual articles were compared and sorted with those of others, and stand-alone categories started to emerge. The process were repeated until the entire corpus of articles had been coded. A sample of this process is presented in Table 5 below.

Sample of batch categories	Sample of an open coding category
<p>“Scholars</p> <ul style="list-style-type: none"> • Scholars have an understanding of how traditional publishing model are limiting their readership. • Scholars' fear of open access publishing is due to anxiety regarding their research impact. • The fear of decreased impact results in a reluctance of engaging with open access. • Scholars have an increasing awareness of the benefits and drawbacks of open access. • Increased awareness results in an increased interest in open access publishing. <p>(from concepts found in Georgiou & Tsakonas 2010, part of batch 3)</p> <p>“Authors</p> <ul style="list-style-type: none"> • Act in open access through settling content in repositories. • Their contributions in institutional repositories is one of the significant elements of open access due to their settling content in repositories. • If authors do not contribute content this will result in a slow uptake of institutional repositories. • Authors are the opinion leaders of the institutional repository movement and are able to influence other authors to engage in new technologies (institutional repositories)” <p>(from concepts found in Kamraninia & Abrizah 2010, part of batch 4)</p>	<p>“Authors (Scholars)</p> <ul style="list-style-type: none"> • Acts in an open access environment through settling content in open access repositories. • Authors are central actors regarding populating institutional repositories. If authors do not contribute this results in a slow acceptance of institutional repositories. • Authors are opinion leaders of the institutional repository movement and are able to influence other authors to engage in new open access technologies (institutional repositories). • While authors understand that the traditional publication models limit their readership they also have a fear of open access publication of their content can negatively affect their research impact, which results in a reluctance in their engagement with open access. • Awareness among author regarding the benefits and drawbacks of open access is increasing, which are making authors increasingly accept open access. <p>(sample of grouped concepts from batch 3 and 4)</p>

Table 5. Samples of open coding with emerging categories.

Axial coding is where the relationships between categories, as well as between categories and their subcategories and their properties and dimensions, are identified. Properties are substantive extensions to the conceptual data contained in the categories, which provide detail to the categories to which they belong, and dimensions are indicators of a conceptual movement or possibility of measurement of any kind within the categories and their properties. These categories, properties and dimensions should accurately identify patterns or themes of the studied subject (Gibson & Hartman 2013; Wolfswinkel *et al.* 2013). Strauss & Corbin (1998) discusses axial coding thoroughly, where they state that the distinction between the open coding and axial coding phases of their approach to grounded theory is artificial in the sense that the phases occur simultaneously, but where axial coding codifies the relating of concepts into categories, sub-categories, properties, and dimensions in the emerging theory.

Selective coding is used to integrate the identified categories and refine them. It is during this coding that the researcher theorises and the core-category emerges (Strauss & Corbin 1998). Wolfswinkel *et al.* (2013) states that “A ‘main category’ in our literature-review method is either the subject of the review or concerns directly one or more of the specific research questions. Although axial coding is about finding the relations between categories and their sub-categories, selective coding is the process of identifying and developing relations between the main categories” (pp. 51). The theory building that takes place during selective coding is a construction based on the abstraction of concepts and categories into relational statements that aim to explain what is going on in the data. The interrelations between the categories are put into a larger theoretical scheme that tries to explain what is going on, and are constructed in a sense by the grounded theorist (Strauss & Corbin 1998). The subject of the review of this thesis is open access as it is discussed in literature relevant to digital library research, therefore the core-category *Open Access* emerged naturally to which the other categories were related. The core-category and the categories that emerged during the coding step is presented in the analysis in chapter 3 in a way that tries to illustrate this building process and their identified relationships, where the selective coding is represented by the relational statements found in the end of each section.

Example of selective coding

Open and axial coding resulted in a grouping and comparison of concepts that allowed the emergence of the sub-category *Open Access Manifestations*. This sub-category represent the concepts that discusses the practical application of open access ideas through open access repositories and journals. During selective coding, the concept “Authors are opinion leaders of the institutional repository movement and are able to influence other authors to engage in new open access technologies (institutional repositories)”, that we can find in table 4 and 5, was identified to contain relational statements that connects the concepts categorised within the *Manifestations of Open Access* sub-category. This concept related the sub-category *Attitudes to Open Access* of the *Authors* category to the *Open Access Manifestation* sub-category of the *Open Access* core-category as this shows how the *Authors* category contain a function as influencers among themselves regarding whether to engage in the open access technology that the institutional repositories represent.

Table 6. Example of selective coding.

2.6.2 Theoretical saturation

One of the aims for any grounded theory is for its categories to reach theoretical saturation, which is the point of coding where no new discoveries that leads to alterations of the categories and/or their properties and dimensions occur. Important to understand, when considering theoretical saturation in the light of grounded theory, is that it is *not* the discovery of recurring patterns when looking at the data, instead it means that no new theoretical insight can be discovered by comparing the emerged categories and their subcategories in the process of constant comparison (Charmaz 2014).

2.6.3 Memoing

During the entirety of the coding process it is essential for a grounded theorist to take notes about the ideas that emerge from analysing the data collected. These notes are written to make the emerging ideas and processes more tangible and have been named many things in the grounded theory literature (Charmaz 2014; Gibson & Hartman 2013; Glaser & Strauss 1967). For this thesis they will be described with the terms used in more recent literature: memos.

The concept of constant comparison is of importance when memoing. As the process of coding moves on, there will be several incidents of data that seems to be more or less similar. When these incidents appear and the data points to something that could possibly result in the emergence or changing of a category, this should be recorded (Gibson & Hartman 2014).

Wolfswinkel *et al.* (2013) also describes the importance of memos, indeed they mention it as something fundamental to the work process that they have outlined in their article, where the documentation of the emergence and changing ideas makes it possible for the tracing of thought processes and of retrospective comprehension of decisions. Memoing is, to them, what makes a grounded theory transparent and replicable. While the memos in their original form is not included in the thesis, they are represented in that the recorded theoretical insights and ideas are included in the text for the analysis.

2.7 Step five: Present

After, and even during, the coding process, it is important to consider the presentation of the emerging theory, as the researcher should by now have acquired a considerable amount of concepts, categories and memos and it is time to assemble the theory (Wolfswinkel *et al.* 2013). Strauss & Corbin's (1998) definition of a theory in grounded theory is “*a set of well-developed categories (eg. themes, concepts) that are systematically interrelated through statements of relationship to form a theoretical framework that explains some relevant social, psychological, educational, nursing or other phenomenon. The statement of relationship explains [sic] who, what, when, where, why, how, and with what consequences an event occurs*” (pp. 22). They also identify that theories often offers an explanation about a phenomena that could aid in the development of a field of knowledge (Strauss & Corbin 1998). The phenomenon this thesis tries to explain is how the subject of open access is discussed in digital library research and tries to answer the research questions stated in the introductory chapter and attempts this by utilising the grounded theory literature review method suggested by Wolfswinkel *et al.* (2013). The theory is presented in chapter 3.

Theoretical sorting is a concept in grounded theory that formalises the sorting of concepts into categories and the process of relating them to the core-category and other main categories for the purpose of presenting the theory that emerged during the coding process. This means that the sorting for any grounded theory is determined by what end result is being attempted; it being a book, an article, presentation, or any other type of

presentation (Gibson & Hartman 2014). The theoretical sorting done for this thesis should therefore be fitted to the traditional structure of a thesis, and that of the thesis being a literature review. The theoretical sorting of the core-category, categories, their properties and dimensions, and the memos are found in the analysis of chapter 3, which presents a body of text that represent the coded data along with figures that summarises the thought process behind the theoretical sorting and also provides a summary of the relational statements derived from the body of text. The figures are presented directly after the substantive data represented by the body of text in the end of each sections that describes the categories. In the concluding chapter 5 the author will draw upon the relational statements summarized in these figures to produce narratives that captures the complex relationships in the emerged theory that consists of the core-category and categories and the relationships between them. If the narratives are adequately capturing what is stated in the core-category, categories and their identified relations, they should be able to answer the research questions according to the aim stated in the introductory chapter 1. This follows suggestions regarding the presentation of a grounded theory in Gibson & Hartman (2014) and Wolfswinkel *et al.* (2013).

2.7.1 Developing a formal or substantive theory doing grounded theory

There is a distinction between the two types of theories that the grounded theory method can produce: a substantive or formal theory. Substantive theories are developed for a set area of inquiry, such as professional education, specific to a group or context. Formal theories are developed for a conceptual area of inquiry, such as stigma, and have a broad applicability not specific to a particular group or context (Bryant & Charmas 2007; Glaser & Strauss 1967). Gibson & Hartman (2014) describes a substantive theory as consisting of “propositions attributing to a unit a set of variable things usually arranged around a core problem which is labelled the core-category” (pp. 39). This thesis attempts to develop a grounded theory literature review regarding how open access is discussed in literature relevant to digital library research. As this contains the theory within the context of digital library research, being a grounded theory literature review, the resulting theory should be considered substantive.

The core-category of a substantive theory is the category that explains the central problem that is being studied and to which the other categories are conceptually relevant. The categories does not relate to the concepts of the core-category directly, but instead proposes variables to the core problem being studied as it is presented in the core-category through the relationships identified between the categories and between the categories and the core-category (Gibson & Hartman 2014). This is consistent with what was stated in section 2.6.1 regarding selective coding and in section 2.7 regarding the presentation of the thesis.

2.8 Determining the validity of a grounded theory

Openness is an absolute core attribute of the grounded theory method, as it is important for the researcher not to make the theory-building forced and/or preconceived. It is

important to note that openness in grounded theory does not explicitly demand a completely blank slate in the researchers mind regarding any preconceived notion of a subject being targeted for research. Here it is important to note the distinction between *having* and *using* preconceived notions. It might be impossible for a researcher to start a project without any preconceived notion. After all, most people usually have their own perspectives and opinions on any given topic. The major issue here is for the researcher to avoid *using* these preconceived notions in the process of generating his or her theory (Gibson & Hartman 2014). Glaser (1978), mentions this in his book *Theoretical sensitivity: Advances in the Methodology of Grounded Theory*, where he describes open coding as something “diametrically contrasted with a preconceived code” (p. 56). To him preconceived coding is circumvented through a line-by-line coding of the material as this results in that any notions about the data rises from the data and not the mind of the researcher (Glaser 1978). This handling of the data is integral to the grounded theory method that Wolfswinkel *et al.* (2013) suggests.

To further avoid pre-conceived coding, the author of this thesis have taken the advice of Gibson & Hartman (2014) regarding how to approach a review of earlier literature. Their suggestion is to start the review first after that a larger portion of the substantive coding have been conducted and when the core-categories and other major categories have started to emerge. This is also due to the principles of theoretical sorting stated above, where the presentation of data must fit the medium that it is being presented in. In this thesis the review look for expansions and gaps in the emerged core-categories and categories presented in the analysis chapter of the thesis, and functions as a discussion to the emerged theory of open access in digital library research. This is so that the author and potential readers can validate the emerged categories against this literature.

This is related to the notion of a researcher having *theoretical sensitivity* for the data collected. This concept means to have the skill necessary to discover theoretical insight in the process of looking at the data. This was first stated by Glaser & Strauss (1967) and were further developed by Glaser (1978). Gibson & Hartman (2014) discusses theoretical sensitivity to be both a skill and an attitude of the researcher that allows the construction of a theory that *fits* and *works* through the induction of data. Theoretical sensitivity is in this thesis maintained through the aforementioned line-by-line reading of the included articles, which helps the researcher to recognise subtle differences in the data and to discover meaning thereof.

2.8.1 Criteria for validity in a grounded theory

The four criteria that Glaser and Strauss (1964) established for evaluating the quality of a grounded theory, and that Glaser (1974) reiterated, has remained the standard for grounded theorists today. These four criteria are *fit*, *workability*, *relevance*, and *modifiability* (Gibson & Hartman 2014).

Fit means that the categories that emerges through coding should fit the data that have produced them (Glaser 1974). This is done by avoiding pre-conceived coding. This thesis uses the line-by-line coding process suggested by Gibson and Hartman (2014) and Wolfswinkel *et al.* (2013) to achieve fit, and by avoiding earlier literature until after the coding as described above.

Workability is the criteria that tries to capture how adequately the emerged theory can explain the area of research (Glaser 1974). The rigorousness of the method presented in Wolfswinkel *et al.* (2013) regarding searching, selection and coding is hoped to produce a workable theory, meaning that the grounded theory literature review adequately captures how open access is reflected in digital library research.

Relevance is a criteria that regards the emergence of a grounded theory. As the grounded theory naturally emerges through the coding of the data, the relevance of the data should become apparent through it being of interest particularly to stakeholders that are invested in the subject of research (Glaser 1974). This thesis should therefore, if relevant, be of interest to digital library researchers that are invested in the subject of open access. In chapter 4, this criteria is tested by comparing the findings of earlier literature with the theoretical sorting that make up the grounded theory emerged through coding in chapter 3. This is to see if the core-category, categories and the relational statements between them are adequately capturing the discussion as it has been reviewed by other researchers.

The discussion in chapter 4 is aimed towards testing modifiability as well. Modifiability is the degree to which a grounded theory is open for alterations as new data is discovered, making it remain relevant and retaining fit and workability (Glaser 1974).

2.9 Alternative methods

This thesis will use grounded theory as opposed to other approaches and methods to seek an answer to the research questions. Mansourian (2006) discusses grounded theory as tool in library and information science that respond to a need for exploratory and thorough examinations of the fields many research questions and topics of interest. This thesis is concerned with how the ideas of open access and its related concepts are discussed, understood and interlinked in digital library research, and a particular advantages that grounded theory have is that its close proximity to the data have the ability to produce a theory that is likely to be intelligible and usable by the actors involved in the phenomena studied (Connaway & Powell 2010). Furthermore, Denscombe (2010) mentions that the “grounded theory approach [...] [have] the desire to probe deeply into a relatively restricted area of study” (pp. 106). Although, he also warns that grounded theory is “best suited to making use of data in the form of interviews, documents and images where the number of items is likely to be relatively small” (Ibid.) This thesis wishes to explain the inner workings of a single phenomena found in Nguyen & Chowdhury’s (2013) knowledge map of digital library research map.

There are similarities between the grounded theory method and that of content analysis, mainly in the close and systematic step-by-step examination of data through coding to uncover patterns and themes inductively that allows subjective but scientific results to emerge (Zhang & Wildemuth 2009). A qualitative approach to content analysis could therefore be able to produce similar findings and analysis from the articles selected, which addresses weaknesses regarding the qualitative approach to the analysis of data (Zhang & Wildemuth 2009). Although, an explicit motivation behind the undertaking of this thesis was for the author of this thesis to become familiar with the literature behind the grounded theory and gain experience in its application. This was central in the selection of grounded theory as the choice of method for the research process in the thesis despite interesting alternatives.

3 Findings and analysis

The analysis chapter will discuss and present the core-category, with its sub-categories and their properties and dimensions, and the related categories and their sub-categories, properties and dimensions, in detail. The core-category and the categories are the results of an exploratory and inductive process applied to deconstructed conceptual data that were extracted from excerpts and compared in the open, axial, and selective coding applied through the grounded theory method suggested by Wolfswinkel *et al.* (2013). This method is guided by the grounded theory approach of Strauss & Corbin (1990, 1998), in which excerpts are pulled and scrutinised from the literature under study through a line-by-line reading and rereading and reconstructed through theoretical sorting.

Below the theoretical sorting of the concepts discovered and categorised during the coding process are presented in the core-category and categories. Together, with their conceptual relationships, they represent the theory of how open access is reflected in digital library research. The core-category is according to Wolfswinkel *et al.* (2013) the main subject of research. In this thesis, the core-category *Open Access* represents the theoretical sorting of concepts related to the main research question of the thesis, meaning open access as a subject in digital library research. The categories are the theoretical sorting of concepts related to the secondary research question, which regard which subjects are discussed in relation to open access in digital library research. The ordering of these concepts resulted in the categories *Authors, Scholarly Communication, Libraries and Librarians*, and *Developing and Transitional Countries*.

As the thesis uses grounded theory as an approach to produce a literature review, it is important for the author to be able to share the substantive conceptual data found during the analysis that both captures what the data are saying, but also how the theory was developed. The substantive data that represents the literature used for the grounded theory literature review is found in the body of text of the analysis. As the coding process applied to the excerpts are the gathering and comparison of similar concepts relevant to the research questions, and the relational statements between the concepts, the author of this thesis decided to avoid traditional referencing as this would prove to be tedious reading. While the theoretical sorting is the work of the grounded theorist, it is important to state that the author of this thesis does not claim authorship of the data represented in these categories, and the reader is instead encouraged to make use of the coding maps of the core-category and the categories included in Appendix B, together with the separate reference list found in chapter 6 that lists the journal articles used for the analysis, to explore the articles containing the excerpts that allowed the grounded theory to emerge from and only from the data. The text will include traditional referencing when factual and controversial statements are made, and will also quote excerpts to illustrate the emergence of the categories. The theorising will be presented in the body of text through the use of italics to indicate that it is the relationships between the core-category, categories, and their sub-categories, properties and dimensions that is being lifted. The theorising will also be illustrated through the figures that follows in the

end of each section, which explains the reasoning behind the theoretical sorting of the categories into sub-categories and properties, and will also includes a summary of the relational statements that the were identified in and between the categories, their sub-categories, properties, and dimensions. This theorising the author of the thesis do claim to be the creator of as they reflect the coding process. The relational statements will be used to represent the emerged grounded theory through the construction of the concluding narratives presented in chapter 5.

3.1 Core-category: Open Access

The *Open Access* core-category is the result of the comparison of the deconstructed conceptual data found in the excerpts that describe the ideological and conceptual groundwork which ideas results in the *manifestations* of these ideas in *Open Access Repositories* and *Open Access Journals*. The ideas and ideology contained within this core-category, as will be shown below, can be used to press different agendas, and offers a solution to the current problem of dissemination of scholarly content that could potentially, if *Open Access* is implemented universally, fundamentally change the *Scholarly Communication* landscape as it is described in the *Scholarly Communication* category. Achieving this requires the cooperation and success of its proponents, *advocates* and contributors that are found in the categories *Libraries and Librarians* and *Authors*.

Open Access is conceptually represented as a new radical dissemination model for scientific research publications, grounded in a movement which central tenet is to provide free, immediate, and barrier free access to scholarly and other content through the web for the benefit of readers and research. *Open Access* is mainly an approach to the dissemination of *Scholarly Communication*, and the reasons that underpin the importance of *Open Access* to *Scholarly Communication* is the potential it offers to and through accelerated research, and the enriched education and faster accumulation of knowledge made possible through this immediate free and online access.

The distinction between *Open Access* and that of free access is important to note. *Open Access* implies the freedom for the reader to view, use, and distribute content, while free access without the ideology of *Open Access* restricts all other interaction but the ability to view the content. For instance, the *Health InterNetwork Access to Research Initiative* (HINARI), an initiative directed towards providing free of charge research to developing countries, is criticised for being merely free access to a portion of developing countries that cannot afford subscriptions to scholarly journals. HINARI is thus not considered *Open Access*, because of the barriers set up by the *Commercial Publishers* that disallow some countries to access the content because they do not fit certain criteria (Uddin, Pérez Koehlmoos & Shahed Hossain 2014). To continue the comparison of free access and *Open Access*, in *Open Access* the copyright of published content is retained by the *Author* of that content, while copyright to content that is free access can be held either by *Commercial Publishers* or the *Authors*. Where the copyright resides has significance, as the goals of the *Authors* and the *Commercial*

Publishers differs greatly. The difference can be read in more detail below in the *Authors* category and *Scholarly Communication* category, but the essence of it is that where *Authors* want to gain career advancements, *Commercial Publishers* want to gain profit.

The definitions of *Open Access* found in the data are many, and should be considered to be under constant development, but the data extracted from the excerpts for this thesis are mostly pointing to the definition of the *Budapest Open Access Initiative* (BOAI), which is that *Open Access* is freely available scholarly content found online that is accessed without barriers regarding access and other legal and financial constraints and is free to use.

As will be seen in the *Libraries and Librarians* category, the *Open Access* ideas and their *manifestations* are championed by *Libraries and Librarians* as their fundamental values correspond well with the ideology that underpins the movement, which take form in the work they perform in developing and managing *Open Access Manifestations*.

Open Access as an ideological imperative for the equitable way for the sharing of research and learning between developed, transitional and developing countries is another significant attribute of the *Open Access* core-category that is discussed in the *Developing and Transitional Countries* category, along with some unique characteristics that the development of *Open Access* ideas into actual outlets of *Scholarly Communication* in the developing part of the world have.

The category *Authors* is in direct relation to *Open Access* in their role as *Content Providers* and *Copyright Owners* of *Open Access* material. The data suggests that it is the choices of *Authors* to contribute their content as *Open Access* that dictates the success of the movement. Therefore it is very important for the *Open Access* movement to be able to make it possible for *Authors* that are willing to publish their works as *Open Access* to reach promotion and tenure, as the furthering of careers are central to *Authors* decisions on where to publish. This is explored further in the *Authors* category, but also to a certain degree in the *Scholarly Communication* category. The fundamental part that *Authors* plays in the success of the *Open Access* movement in particular and the evolution of *Scholarly Communication* in general is illustrated clearly by one excerpt that discusses how to overcome psychological resistance to *Open Access Repositories*:

“The protagonists are the researchers, and their struggle is to obtain recognition for their work and to advance scholarship by providing maximum access to the greatest audience of scholars and to obtain as much access as possible to the work of their peers so that they can build on it. The protagonists are thwarted in their attempts to achieve their ends by avaricious publishers who obtain the work of researchers for free and then sell it back to them in the form of journal and database subscriptions and books for exorbitant prices. These prices far exceed the rate of inflation or the budgets of universities to pay for them. The publishers engage in a series of mergers and acquisitions that swallow up small publishing firms and result in the scholarly publishing enterprise being controlled

by a few giant firms that offer unreasonable terms to users and make unreasonable demands when negotiating with them” (Quinn 2010, pp.72).

Core-category: Open Access			
Description This core-category represents the ideological statements and statements regarding purposes, ideas and goals of the open access movement as they are found in digital library research. It is presented as a radical movement for the dissemination of research. Its ideas and goals and the <i>manifestations</i> of these ideas and goals allows the entities theoretically sorted into the categories <i>Authors</i> , <i>Scholarly Communication</i> , <i>Developing and Transitional Countries</i> , and <i>Libraries and Librarians</i> to solve problems, handle issues or gain <i>benefits</i> regarding their activities.			
Authors	Scholarly communication	Developing and transitional countries	Libraries and librarians
Relevance of core-category <i>Authors</i> are in direct relation to <i>Open Access</i> in their role as <i>Content Providers</i> and <i>Copyright Owners</i> of <i>Open Access</i> material. It is the choices of <i>Authors</i> to contribute their content as <i>Open Access</i> that dictates its success, and to earn the compliance of <i>Authors</i> the <i>Open Access</i> movement must offer opportunities for the <i>Authors'</i> careers.	Relevance of core-category Through free and open dissemination of research as proposed by the <i>Open Access</i> movement <i>Scholarly Communication</i> can be revolutionised through enhanced education and faster accumulation of knowledge.	Relevance of core-category Through <i>Open Access</i> ideas, <i>Developing and Transitional Countries</i> can gain access to research that would without the free and open access be unavailable to them.	Relevance of core-category <i>Libraries and Librarians</i> are champions of <i>Open Access</i> ideas as their fundamental values correspond well with the ideology that underpins the movement and the work they perform in developing and managing <i>Open Access Manifestations</i> .

Fig. 1. The *Open Access* core category.

3.1.1 Sub-categories of the *Open Access* core-category

The subcategories of the *Open Access* core-category consists of concepts that are less abstract than the ideas and ideology that the *Open Access* core-category represent, as it regards entities that impact different actors directly, or give effect to interactions between them. These subcategories are; *Manifestations of Open Access*, *Barriers to Open Access*, and *Benefits of Open Access*. The principles for the theoretical sorting performed for these sub-categories are summarised in the descriptions in figure 2. Figure 2 also lists the properties that are attributed to these sub-categories. These properties are presented in full below in respective section.

Sub-categories of the Open Access core-category		
Manifestations of Open Access	Barriers to Open Access	Benefits of Open Access
<p>Description This sub-category represents the theoretical sorting of how the ideology and ideas of <i>Open Access</i> are being actualised as an entity for different actors to engage with.</p>	<p>Description This sub-category is the theoretical sorting of the concepts that describes the obstacles that <i>Open Access</i> is facing regarding its actualisation as an alternative approach to traditional <i>Scholarly Communication</i>.</p>	<p>Description This sub-category presents the benefits that the implementation of <i>Open Access</i> ideas in <i>Scholarly Communication</i> is offering different actors and <i>Scholarly Communication</i> in general.</p>
<p>Properties <i>Open Access Repositories</i> <i>Open Access Journals</i> <i>Awareness of the Manifestations of Open Access</i></p>	<p>Properties <i>Authors as Barriers</i> <i>Financial Barriers</i> <i>Technical Barriers</i> <i>Legal Barriers</i></p>	<p>Properties <i>Increase of accessibility</i> <i>Increase of visibility</i> <i>Increase of usability</i></p>

Fig 2. Sub-categories of the *Open Access* core-category.

3.1.2 Sub-category: Manifestations of open access

The *manifestations* are termed in different ways in the excerpts, such as models, routes, or roads, but are always colour coded as green and gold as they were when they were first defined in the BOAI. In this sub-category, they are termed *manifestations* as the coding of the excerpts identified a relationship between categories in which it is the *Authors* that creates the content that is being made *Open Access* and through their contributions they make the ideas of the *Open Access* movement manifest. These *manifestations* allows the ideas to become entities that can function as tools for real world actors and can offer solutions to identified issues in *Scholarly Communication*.

The *manifestations* as real world entities can only be realised through the actions of *Authors* when they, in their role as *Content Providers* and *Copyright Owners*, commits to the act of *Self-archivation* in an *Open Access Repository* (allowing the green *manifestation*) or through publishing their works in an *Open Access Journals* (allowing the gold *manifestation*). In the gold *manifestation* the content is made available in its final form immediately through journals published under *Open Access* principles in one unified location. Green content can be made available in different versions, pre- or post-print, or anywhere else in the publication process, sometimes even as publisher versions. In the green *manifestation* the content are often embargoed by *Commercial Publishers*. These embargoes may results in the content being unavailable for a significant amount of time from the moment of publication in a commercial journal to the deposition in an *Open Access Repository*, often six to twelve months (see for example Chowdhury 2014a; Shotton 2012). This has made some *Open Access* proponents critique the *Open Access Repository* approach for not reflecting the ideas of *Open Access* properly, as they lack the immediacy of the gold *manifestation*. Although, there is a recognition that *Self-archivation* in an *Open Access Repository* is an important *Open Access* strategy in that it, besides from the removal of access and price *barriers*,

also considers the need for long-term *Preservation*, which is something that is not offered without outside intervention regarding *Open Access Journals*.

The goal of both *manifestations* are to facilitate content freely, regarding access and use, through the internet, but the green *manifestation* is about providing access to already published material and offering preservation of that material, while the gold manifestation offers original publication which also validates and certifies research result through publishing processes such as peer-reviewing, editing, designing, production, marketing and distribution (see for example Ferwerda 2010).

The growth rate of the *Open Access Manifestations*, being an indicator of the success of the ideology in being a pervasive alternative to traditional *Scholarly Communication*, is increasing with time, and the milestone goal of providing half of *Scholarly Communication* as *Open Access* is being approached (Chen 2014). Predictions have been made that by 2025 scholarly content can be up to 90% *Open Access* (Rizor & Holley 2014).

The theoretical sorting of the concepts regarding the *manifestations* of *Open Access* resulted in three properties attributed to this sub-category. These properties specifies instances and circumstance of the *manifestations* and are described in figure 3 below.

Sub-category: Manifestations of open access		
Description This sub-category is the theoretical sorting of concepts that reflects how the ideology and ideas of <i>Open Access</i> are being actualised as an entity for different actors to engage with and the impact it has in various areas. The ideas that are being made manifest are the free and open dissemination of scholarly content online. The <i>manifestations</i> functions as tools for different actors to solve issues relevant to them.		
Properties		
Open access repositories	Open access journals	Awareness of the manifestations of open access
Description The green <i>manifestation</i> of <i>Open Access</i> ideas are making the dissemination and preservation of digital <i>Scholarly Communication</i> accessible and free online for anyone to use through institutional or disciplinary <i>repositories</i> .	Description Through the gold <i>manifestation</i> of <i>Open Access</i> ideas, digital <i>Scholarly Communication</i> is disseminated in online journals that are free from access barriers and subscription fees.	Description The <i>awareness</i> of the <i>manifestations</i> of <i>Open Access</i> is low, but is also the key to its success as a progressive outlet for <i>Scholarly Communication</i> . The <i>awareness</i> is equally important to both the green and gold <i>manifestation</i> and the knowledge about them needs to be raised for them to succeed as their use and the <i>awareness</i> of them are linked.
Summary of relation statements:		
<ul style="list-style-type: none"> • Through its <i>manifestations</i> the <i>Open Access</i> movement offers real life entities that works as tools to handle issues in and offer solution to problems identified by different actors regarding <i>Scholarly Communication</i>. <i>Open Access Repositories</i> also offers <i>Preservation</i> of <i>Scholarly Communication</i>. 		

Fig 3. Properties of *The Manifestations of Open Access* sub-category.

Figure 4 formalises the interactions that *Authors as Content Providers* can perform with the *manifestations* of *Open Access*. This bridges the *Open Access* core-category with that of the *Authors* category through the sub-category *Open Access Manifestations* and the concepts found within the *Authors* category.

Authors interactions with the manifestations of open Access	
Self-archivation	Publishing
<i>Authors as Content Providers</i> chooses to <i>Self-archive</i> , manifesting <i>Open Access</i> ideas through <i>Open Access Repositories</i> .	<i>Authors as Content Providers</i> chooses to publish in an <i>Open Access Journal</i> , thus manifesting <i>Open Access</i> ideas.

Fig 4. Relational statements between the *Manifestation of Open Access* sub-category and the *Authors* category.

3.1.2.1 Property: Open access repositories

Open Access Repositories are a *manifestation* that can be conceptually ordered as either an *Institutional Repository* or a *Subject Repository*, meaning that *Open Access Repositories* can be either institutional or disciplinary in scope. Both institutional and disciplinary *Open Access Repositories* share that they are databases that disseminate and preserve born-digital or digitised scholarly content through online technology. Both forms of *Open Access Repositories* are actualised through a long, costly and arduous process that requires adequate funding, technological infrastructure, and skills needed for management and maintenance, but if properly kept have been shown to take a positions as some of the most prominent digital library applications available (Latif, Borst & Tochtermann 2014).

As we have seen above, the green *manifestation* is realised through the deposition of content in an *Open Access Repository*. This content are usually made available to everyone free of cost after a certain period of time is elapsed since the first publication of the paper (called the embargo period that is imposed by commercial interests) through the act of *Self-archiving* performed by *Authors*, who submits a final copy of their papers to a repository that can then be accessed by anyone free of cost. The content being held in the *repositories*, and the value of the *Open Access Repositories* themselves, are closely related to this cooperation and participation of *Authors as Content Providers*. As we saw above, and which will be further described in the *Authors* category, the act of *Self-archivation* is one of the two primary interactions with *Scholarly Communication* that *Authors* can use in the context of making their content available according to the principles of *Open Access*.

The *Open Access Repositories* property is related to the *Libraries* sub-category as *Libraries* are increasingly offering basic publication services beyond articles and monographs through *repositories* (see for example Adema & Schmidt 2010). There is a wide range of types of content in *Open Access Repositories* that *Libraries* can use to showcase the output that the institutional and disciplinary communities produce. Larger *Open Access Repositories* are now also incorporating newer types of digital content in

the collection, such as data sets and teaching materials, electronic thesis and dissertations, covering material from the sciences, humanities, social sciences, and the arts, expanding on the content already held by established *repositories* (as described by for instance Bhardwaj 2014; Bjork 2014; Zainab 2010).

Due to the ever increasing amount of scholarly content being created there is also an increased need for *Open Access Repositories* to be integrated, interconnected, and multidisciplinary (as seen in for example Cassella & Calvi 2010). Suggestions from the excerpts states that *Open Access Repositories* are becoming a necessity due to an increasing need for *Scholarly Communication* outlets that offers both adequate speed and capacity to handle this stream of information. Interoperability should therefore be a priority, where the exposing of data would significantly contribute to the *repositories* through added value, where the semantic web and the *Open Access* movements can jointly work towards wider dissemination (see for example Latif, Borst & Tochtermann 2014).

The enormous increase of the volume of digital content that has happened in the last decade has prompted the establishment, development and maturation of *Open Access Repositories*. This is due to the need of institutions and universities to establish adequate tools to handle the flow of content produced by the *Authors* associated with them, as well as to preserve this content, and the knowledge within it, for future use. This has made the *Open Access Repositories* movement an authoritative force for *Open Access* which grows steadily through the contribution of *Authors as Content Providers*. As *Authors* continue to *Self-archive*, *Open Access Repositories* are presumed to reach a *Critical Mass*, which will for the thesis be considered a dimension of the *repositories* property. This dimension marks a build-up for the usefulness of a given *Open Access Repository*.

Critical Mass is when an *Open Access Repository* have accumulated an amount of content that effectively renders it essential for *Authors as Researchers* in their work-flows. *Critical Mass* would then, it is suggested, prompt *Authors as Content Providers* to deposit in *repositories* due to that *Authors as Content Providers* want their research to have a high impact, thus making *Open Access Repositories* an even stronger source of *Scholarly Communication*. *Critical Mass* should therefore be considered an essential criteria for the success of any *Open Access Repository*. The *Critical Mass* of *Open Access Repositories* were by the data mainly discussed when considering *Institutional Repositories*, where the increase of content in an *Institutional Repositories* is equated with an increase of its use (see for example Baba & Mori 2012; Puplett 2010).

So, it is through *Authors* that contribute content through the act of *Self-archivation* that *Open Access Repositories* reaches this *Critical Mass*. Strategies to hasten this progress towards *Critical Mass* are to increase the volume by uncovering buried or hidden content and to populate the *Open Access Repositories* with it. *Libraries and Librarians* can make sure that further burying of valuable content does not happen through *Advocacy* and development of attractive services for *Open Access Repositories*. Suggestions for the development of these attractive services include to avoid repetition

regarding required work that is attributed to the adding of metadata when depositing. This is because metadata creation is a time consuming process that could be solved through simultaneous registration in both the *Researcher* database and an *Institutional Repository* (Baba & Mori 2012). Another suggestion is for *Subject Repositories* to reach this *Critical Mass* through harvesting content of several *Institutional Repositories*, thus concentrating scholarly work in a subject field from many institutions into a single repository, which would create an essential *Open Access Repository* in a particular subject field (Latif, Borst & Tochtermann 2014).

Institutional Repositories as a type of the *Open Access Repository* property represents concepts that identifies an institutional entity that redefines the production, dissemination, and the use of digital scholarly content inside the institution that hosts the *repository*. *Institutional Repositories* are suggested by the data to be a new mode of distribution of research and *Scholarly Communication in general*, that also offers indefinite *Preservation*. The *Preservation* is theoretically sorted into a sub-category of the *Scholarly Communication* category, which represents concepts regarding the continuous use of scholarly content for the future. Furthermore, they enables the actualisation of the *Benefits of Open Access*.

Institutional Repositories are critical *manifestations* of *Open Access* that reform the current system of *Scholarly Communication* through allowing *Authors* to remain in their role of *Copyright Owners*, and by challenging the *Commercial Publishers* that currently hold the power over publishing through their hold on journal publishing. This restructuring of *Scholarly Communication* is believed to bring financial relief to both institutions and *Libraries*. *Institutional Repositories* can also work to showcase the scientific output that an institution produces, and functions through this as a marketing tool that could increase the hosting institution's prestige.

During coding *Institutional Repositories* emerged as a suggested tool for the continuous collection, preservation, and dissemination of the digital scholarly content being produced within a particular institution which accumulates content and remains accessible for anyone to use. This tool allows *Open Access* ideas to *manifest*, through which *Institutional Repositories* contributes to reforming *Scholarly Communication*. The accumulation of content within an *Institutional Repository* is suggested as an advantage as the digital content disseminated by them are found more easily, which eases the accumulation of research. As research typically builds on earlier work, this accumulation is hastened. This is related to how *Open Access* ideas *manifested* in *Open Access Repositories* results in the *benefits* of *Increased Accessibility* and *Increased Visibility*. *Open Access* principles are through the green *manifestation* providing a quick and barrier free access to scholarly content that gives way for new connections to be made through the accumulation of data and knowledge that allows research to progress.

While *Institutional Repositories* works towards the goal of *Open Access* through providing an increased *accessibility* and *visibility* to the deposited *Scholarly Communication*, restricted by *Commercial Publishers* and the *Financial Barriers* they maintain, *Authors as Barriers* remains. This property of the *Barriers of Open Access*

sub-category is directly related to *Institutional Repositories* as it is *Authors as Content Providers* that through their act of *Self-archivation* populates an *Institutional Repository* with relevant content. This in turn determines *Repositories* usefulness and value, which was suggested above when the *Critical Mass of Open Access Repositories* were discussed.

Regarding the relationship between the *Open Access manifestations* and the *Authors* category, were the *manifestations* are reliant in the cooperation of *Authors as Content Providers*, it is vital to recognise that the idea of “build it and they will come” does not apply to the situation of *Institutional Repositories* (Wacha & Wisner 2011). As we will see in the presentation of the *Authors* category and the *Barriers to Open Access* sub-category, the citation advantages and the *Preservation* promises of *repositories* does not persuade *Authors* to comply with *Self-archivation*. For instance, excerpts suggested that *Authors* tend to not deposit their high quality content to *Institutional Repositories* (Wacha & Wisner 2011). This should encourage repository managers, often *Librarians*, to engage with *Authors* through *Advocacy* to persuade them to comply. Other strategies to increase compliance of *Authors* is through the development of *Institutional Repositories* services so that the *Authors* can see how *Institutional Repositories* are more than just an archive of their scholarly output, that they are indeed attractive and useful tools that could ease their work-flows. Suggestions for new features that could persuade *Authors* to comply are easy depositing of content, stable systems for referencing other faculties’ content, exportable data concerning faculty output, customisable interfaces, editorial support, and tracking of publishing (see for example Latif, Borst, & Tochtermann 2014; Wacha & Wisner 2011; Zainab 2010). These services are suggested to be hosted and managed by *Libraries and Librarians*. By working towards these kinds of features, there should be a noticeable shift away from the needs of *Libraries and Librarians* (that of dissemination and preservation of content and the solution to the *Serials Crisis*), towards the *Authors* needs of *Scholarly Communication* to be *Accessible, Visible and Usable* both for the furtherance of their careers and for the benefit of their research fields. The future of *Scholarly Communication* disseminated through *Institutional Repositories* is unclear due to the lack of contribution by *Authors as Content Providers*, and the content in *Institutional Repositories* are still low compared to the entire corpus of published materials which an attractive *repository* service could counter.

The current publishing landscape is suggested by the data to be unbeneficial to *Scholarly Communication* in general. *Institutional Repositories* is in this as a way to wrestle the control of *Scholarly Communication* from the hands of *Commercial Publishers*, and the barriers they set up to the free and accessible dissemination of *Scholarly Communication* which allows them to dominate it for their financial gain. Through the *Open Access Manifestation of Institutional Repositories*, leadership can be assumed by *Open Access* proponents for the benefits of *Authors* and *Scholarly Communication* in general. To achieve this, *Open Access* proponents should establish a consultative body in the development of *Institutional Repositories* that comprises of academic societies, publishers, researchers and users (see for example Eun-Ja 2010). This would enable them to communicate needs and goal properly and also allow them

to be aware of needed system upgrades that allows for an expanded array of potential content. The *Institutional Repositories* movement could lead to new hubs of scholarly content and could establish a global knowledge network. There are possibilities, with the technological revolution, social evaluation (Web 2.0) and freely available content to be able to implement a completely new qualitative and quantitative evaluation research system (Cassella & Calvi 2010). *Institutional Repositories* could in this be used to increase the hosting institutions status and value by providing demonstrations of the scientific, societal, and economic relevance of its research activities.

Collaborations between *Institutional Repositories* are beneficial as it results in the reduction of management costs. This is also true for any constellation of collaboration between *repositories*, whether the cooperation is on an intra-institutional or a national level. A shared burden of infrastructure and funding would result in economical as well as social benefits due to the reduction of the required number of *Institutional Repositories* needed, and that they allow uniform search and access facilities that are familiar to the repository users. Collaboration would also allow smaller or less funded institutions to become engaged with *Open Access Repositories*. The potential of national *Institutional Repositories* are in this regard interesting. National *Open Access Repositories* are operated by government agencies, which allow these repositories the benefits of highly functional and stable software and hardware infrastructure through the robust funding received which could be used by many institutions in a collaborative setting.

Subject Repositories are archived collections of research content that links to a specific subject discipline in which the engagement with *Authors as Researchers* and *Content Providers* in a given field of research is essential to the success of it. *Subject Repositories* cover usually only one broad-based discipline, but allows contributions from *Authors* spanning many different institutions. *Subject Repositories* are supported by a variety of funding agents, and generally relies on the submissions it receives either by individual *Authors* or the institutions that host them. While some subjects have received considerable attention and have achieved sustainability and relevance to their discipline, there are still areas of research void of any sustainable and active *Subject Repository*, such as in chemistry and engineering. It has been argued that the future of *Subject Repositories* depend on the ability to develop a sustainable business model with independent income. The repositories themselves are likely to be funded from one or more sources within the subject community. While most major *Subject Repositories*, such as arXiv, can be seen as permanent manifestations of *Open Access*, at least as long as software and hardware are continuously upgraded and the use-rate of the repository is upheld, it is still easier and more popular to launch *Institutional Repositories* than *Subject Repositories* as *Subject Repositories* often lacks the institutional support and funding that *Institutional Repositories* enjoys. The success of *Subject Repositories* also requires the collaboration of *Authors* in an international network, which *Institutional Repositories* do not. While *Institutional Repositories* are considered natural extension to the current research information systems many universities and institutions use today for the tracking of institutional output of research, *Subject Repository* are not discussed much. While *Institutional Repositories* are being promoted and supported by its hosting

institutions and universities, *Subject Repositories'* promotion has to rely on word of mouth between scholars in a particular field.

So, *Subject Repositories* are currently struggling in comparison to the success *Institutional Repositories* have had in establishing itself as a part of *Scholarly Communication*. This is suggested to be due to that *Subject Repositories* and *Institutional Repositories* are competing for the same articles. This is made apparent in how it is only the largest *Subject Repositories* that contributes significantly to the volume of the green *manifestation* of *Open Access*. While the role of *Institutional Repositories* is clearly established, and gain stable support from their respective institutions, it is not yet established if *Subject Repository* can achieve the same stability and acquire the support that *Institutional Repositories* already has gained from the academic community. As *Subject Repositories* needs to arise directly from the subject, not from the contributing members, the dimension of *Critical Mass for Open Access Repositories* is here vital also to *Subject Repositories*, where *Critical Mass* of content is essential to their success in which *Subject Repositories* needs the complete representation of the research of a subject including all types of material, from papers to datasets. The goal is to transcend the individual sources, and gain relevancy on an international level. So, the success of *Subject Repositories* is measured in how well they cover the entire spectrum of the research output it should or might hold by comparing the actual uploaded content to the potential up-loadable content. *Critical Mass of Open Access Repositories* is here crucial for the success as without it being achieved *Authors* will not accept the *repository* as a potential outlet for their produced scholarly content due to its lack of usefulness, resulting in *Authors* not complying with deposit. This is this is why smaller *Subject Repositories* often fail (Bjork 2014). To illustrate above, one could look at how the earliest, and most successful, *Subject Repositories* were launched by the *Authors* themselves in a particular field as a voluntary operation. ArXiv, a pre-print repository for physics, mathematics, computer science, quantitative biology, quantitative finance, and statistics, is the predominant *Subject Repository* suggested by the analysis. This *repository* showcase the potential that *Subject Repositories* have, because of its significance in its field, the *Critical Mass* they achieved, and their longevity. These kinds of early *Subject Repositories* were personal projects of one or a few entrepreneurial *Authors* that gained support by their parent institutions that allowed them to use their institutions websites for launching their project (Bjork 2014). This allowed them to become natural naves for *Authors as Content Providers* to contribute research. In these *Subject Repositories* the *compliance* of *Authors* is secured because of the *Benefits of Open Access* of *Increased Accessibility* and *Increased Availability* are clear, but also that the discipline as a whole benefit for the free and immediate circulation of ideas, which are connected to that the accumulative nature of knowledge that provides a growing ground for quick and informed scientific discourse (Bjork 2014).

The strongest growth period of *Subject Repositories* is suggested to be over, and the potential to launch new successful projects are suggested to have been diminished, despite the lower technical barriers that exists today (Bjork, 2014). The continued growth of *Subject Repositories* are currently taking place in already established

repositories such as in arXiv, stated above, and in PubMed Central, which continue to thrive because of their already achieved *Critical Mass* and because they have proven their worth through time and are therefore now a part of the *Behaviour* of the *Authors as Researchers* that are active in their particular fields. The success can also be attributed to that in the subject areas where *Subject Repositories* have succeeded as outlets for *Scholarly Communication* it was in areas that already had a strong working paper or pre-print culture before the technological implications for *Open Access Repositories* that emerged with the development of the Internet, such as the case for arXiv, *Social Science Research Network* (SSRN), and *Research Papers in Economics* (REPEC) (Bjork 2014). This illustrates how the research culture in a given discipline is shaping *Authors Open Access Behaviour*. In arXiv, for instance, the *Subject Repository* simply replaced the practice of circulating paper pre-prints in the particle physics community. Another factor is the establishment of *Open Access* mandates enforced by dominant funding bodies to upload copies to a prescribed *Subject Repository*, which was the case for PubMed Central. This suggests that *Open Access* proponents should argue for new mandates that are established by well known funding bodies which would help support the growth of existing or new *Subject Repositories* (Bjork 2014). This is also true for *Institutional Repositories*, and the current trend for funding bodies is to mandate the *Self-archiving* into them instead of *Subject Repositories*.

Property: Open access repositories	
Description The green <i>manifestation</i> of <i>Open Access</i> ideas are making the dissemination and preservation of digital <i>Scholarly Communication</i> accessible and free online for anyone to use.	
Institutional repositories	Subject repositories
Description <i>Institutional Repositories</i> are <i>Open Access Repositories</i> that are developed and managed within an institutional setting and disseminated and preserves the digital content that is being produced within this institutional setting. They acquire content from <i>Authors</i> that are operating within the same institutional setting, and are often managed by <i>Libraries and Librarians</i> operating under the same institutional setting.	Description <i>Subject Repositories</i> are often developed and managed by a particular group of <i>Authors</i> that disseminates and preserves the electronic content produced within a subject of research. <i>Critical Mass</i> of content is here stressed for the perseverance of this type of <i>Open Access Manifestation</i> as the usefulness of the <i>repository</i> as a part of <i>Scholarly Communication</i> will determine its success as it lacks the institutional support given to <i>Institutional Repositories</i> .
Dimension: Critical mass of open access repositories	
Description This dimension describes the degree to which an <i>Open Access Repository</i> has reached a volume of content that effectively makes it a useful and even necessary tool for the dissemination of <i>Scholarly Communication</i> and research. The dimension is dependant on that <i>Authors as Content Providers</i> submit their works in a given <i>repository</i> so that <i>Authors as Researchers</i> view the <i>repository</i> as a valuable source of <i>Scholarly Communication</i> . <i>Subject Repositories</i> are highly reliant on this dimension, as they require the complete representation of the discipline they represent, or <i>Authors as Content Providers</i> will not comply with <i>Self-archiving</i> .	

Fig 5. The Open Access Repositories property.

Summary of relational statements:

- Through *Open Access Repositories Libraries* are directly engaging with the scholarly output of the institutions they serve. Through this, they engage directly with *Scholarly Communication* when they showcase the institutional output content available for online use. *Libraries* also aid in achieving in *Critical Mass* of *Open Access Repositories* through development of attractive services, *Advocacy* and uncovering content that could populate the *repositories*. *Libraries* engagement with *Open Access repositories* are beneficial as this could bring them financial relief.
- The increased amount of produced scholarly output are making *Open Access Repositories* a necessity for the effective dissemination and *Preservation* of *Scholarly Communication*. *Open Access Repositories* are also critical instruments of *Open Access* that could reform *Scholarly Communication* through challenging the *Commercial Publishers* which are currently in power regarding the dissemination of scholarly content.
- As *Open Access Repositories* can showcase institutional output of *Scholarly Communication* the implementation of the *green manifestation* leads to the *benefits* that the ideas of *Open Access* which are *Increased Visibility*, *Increased Accessibility*, and *Increased Usability* of *Scholarly Communication*. The free access to scholarly content allows for a faster accumulation of knowledge than traditional publishing.

Fig 5 (cont.).

3.1.2.2 Property: Open access journals

Open Access Journals are the gold *manifestations* of *Open Access* and refer to electronic journals that give access to its content immediately at publication without access *barriers* to all users and are free of subscription fees. Peer reviewing is undertaken in *Open Access Journals*, unlike in most *Open Access Repositories*. *Open Access Journals* have the possibility to reduce the costs of subscription imposed by *Commercial Publishers*, a cost which are particularly affecting *Libraries* and *Librarians*. *Open Access Journals* is a growing segment of *Scholarly Communication*, and an increase of support of the manifestation has been gained from both *Authors* and the public, which are increasing with each passing year (see for example Rizor & Holley 2014).

Regarding that *Open Access Journals* provide immediate and full access to research upon publication, which *Open Access Repositories* with its embargoes in some instances do not, it has been suggested that *Open Access Repositories* are in this way failing to fulfil one of the most basic tenets of *Open Access*, which is the inherent immediacy of access (Rizor & Holley 2014). This makes the *Open Access Repositories* work in tandem with the interests of *Commercial Publishers*, which is the retention of access for profit. *Open Access Journals* could therefore be considered more in line with the ideology of *Open Access*.

Early critics of the gold *manifestation* said that without revenue from subscriptions there would be no long-term sustainability of *Open Access Journals* and that they would therefore fail in its goal of progressing the free and open access of *Scholarly Communication* that is fundamental to the *Open Access* movement (Loan 2011). But the financial sustainability of *Open Access Journals* can be made a reality through the support it can receive from foundations, governments, universities, laboratories, and endowments set up by disciplines, as they can provide the financial means to cover the article processing costs. These fees have many names, where they are also known as the author pay-to-publish practice, or author-pay fees. In this model, the costs are moved to the production side, where users of the published content are given full access to articles without charge. The range of these fees are from the 2000 dollars that some *Commercial Publisher* require *Authors* to pay for publishing their articles, in the *Open Access Journals* they provide, to the 7 dollars that is required for deposition in a *Subject Repository* such as arXiv (Lesk 2012).

Open Access can be unilateral or worldwide (Houghton & Swan 2013). Unilateral *Open Access* is where scholarly content is disseminated freely through the internet by some actors or sectors engaged in publishing while other actors or sectors do not. This implies that subscriptions would still be an issue regarding *Accessibility* for the ones that are making the content *Open Access*. In worldwide *Open Access* all content is disseminated by all actors through the *Open Access Manifestations*. The dissemination of content, both *Open Access* and non-open access in *Scholarly Communication* come with a cost. *Open Access Repositories* is the most cost-effective approach of the *Open Access Manifestations* in the current situation of unilateral *Open Access* where content is disseminated both as non-open access and *Open Access*, while *Open Access Journals* would be the most financially beneficial *manifestation* in an all-open access world. This is due to the fact that in a world where not everything is available according to *Open Access* principles, the trade-off between the alternative cost of *Open Access* need to be weighed against the already established subscription costs (Houghton & Swan 2013).

Property: Open access journals
<p>Description Through the gold <i>manifestation</i> of <i>Open Access</i> ideas, digital <i>Scholarly Communication</i> is disseminated in online journals that are free from access barriers and subscription fees.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • The number of <i>Open Access Journals</i> that can be used as an alternative outlets for content in <i>Scholarly Communication</i> is increasing. • The gold <i>manifestation</i> can function as a tool that allows <i>Libraries and Librarians</i> to reduce the costs of subscriptions journals published by <i>Commercial Publishers</i>. • <i>Open Access Journals</i> may be considered as more successful <i>manifestation</i> than its green counterpart as <i>journals</i> allows an immediate and full access to research directly upon publication, where the embargoes imposed on instances of deposited content in <i>Open Access Repositories</i> does not. Free and open access are fundamental ideas of the <i>Open Access</i> movement which makes <i>Open Access Repositories</i> play into the interests of <i>Commercial Publishers</i>, who wishes to extract profit from the access to their published content.



Fig 6. The *Open Access Journals* property.

3.1.2.3 Property: Awareness of Open Access Manifestations

While the *Awareness of Open Access Manifestations* is still low, it is by the data suggested to be a conceptually important aspect regarding the success of the *manifestations* of *Open Access* ideas as alternatives to the current *Scholarly Communication* situation. While there is a support of the concept of *Open Access* among key stakeholder, there is a lack in deep understanding of what it means to participate. This is reflected in an excerpt that pointed out how *Authors as Researchers* are using Google Scholar, and in this might be using content according to *Open Access* ideas without even realising it (Stanton & Liew 2011).

As many *Commercial Publishers* allows *Authors* to *Self-archive*, one must draw the conclusion that the low amount of content in *Open Access Repositories* need to be attributed to the lack of *Authors* participation due to low *awareness* (as seen in for example Benz *et al.* 2010; Lawton & Flynn 2015). The significance of the *Authors* category that we have touched on above is here echoed in the *Awareness of Open Access Manifestations* property, were *awareness* among *Authors* is considered a key to the *manifestations*' success. The theoretical sorting that is represented in the *Open Access Repositories* property accentuated the role that *Authors* play. The *awareness* and participation of *Authors*, as will be seen in the *Authors* category, is impacted by other factors as well such as the practices, communities, work cultures, policies, guidelines, and lifestyles, which will influence the *Authors* in the choices they make in their *Scholarly Communication*.

To both raise the use of *Open Access* content and the rate of which *Open Access Repositories* receive content from *Authors as Content Providers*, the data calls out for the promotion of the ideas and *manifestations* that the movement represents. This promotion is mainly handled by the *Libraries and Librarians* through *Advocacy* (see for example Adema & Schmidt 2010; Uzuegbu & McAlbert 2012; Xia, Wilhoite & Lynette Myers 2011). This promotion should be able to raise the *Awareness* of the benefits that the act of *Self-archivation* and publishing in *Open Access Journals* offers *Authors*, which are that their work is made available nationally and internationally, with increases the contents *Accessibility* and *Visibility*.

Awareness is just as important of *Open Access Journals* as it is for *Open Access Repositories*. *Librarians* are here, again, encouraged by the data to raise *Awareness* among *Authors* through *Advocacy*. This *Advocacy* can be performed by informing *Authors* that more *Open Access Journals* are being peer-reviewed and that services and

indexing of *Open Access* sources present in *Institute of Science* (ISI) databases and Scopus are getting better (Zainab 2010).

Many different approaches to raise *Awareness* are lifted in the data and could be anything from personal emails to promoting online directories and including *Open Access Journals* in the *Open Public Access Catalogue* (OPAC) of *Libraries*, making these sources catalogued, searchable, and linked (see for example Kim Wu & McCullough 2015; Zainab 2010). *Open Access Journals* have similar or enhanced citation pattern to their commercial counterparts, which provides *Open Access* proponents with munition in their *Advocacy* activities. The knowledge about *Open Access* is suggested to be the key to its success, as the use of *Open Access* resources, such as *journals* and *Open Access Repositories*, and knowledge about them are intimately linked to each other. *Advocacy* and its importance to *Open Access* are discussed more in the *Libraries and Librarian* category.

Property: Awareness of open access manifestations
<p>Description This property represents the concepts that lifted how the <i>awareness</i> of the <i>manifestations</i> of <i>Open Access</i> impacts the success of the <i>manifestations</i> as progressive outlets for <i>Scholarly Communication</i>.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • <i>Authors</i> are lacking in their awareness, understanding and knowledge about <i>Open Access manifestations</i> that results in a lack of engagement with the tools the <i>manifestations</i> represent. • Raising the knowledge of and <i>awareness</i> about the <i>Open Access manifestations</i> are done primarily by the engagement of <i>Librarians</i> in <i>Advocacy</i> directed towards <i>Authors</i>. This <i>Advocacy</i> raises the <i>awareness</i> among <i>Authors</i> which results in increased deposition and publishing of content through the <i>manifestations</i>.

Fig 7. The Awareness of Open Access Manifestations property.

3.1.3 Sub-category: Barriers to open access

The *Barriers to Open Access* sub-category is the conceptual data that explains and describes the obstacles that hinders the movements influence of *Open Access* in *Scholarly Communication*. *Barriers* are set up by *Commercial Publishers* and *Authors*, and are tied to copyright, funding and technology. The properties of the *Barriers of Open Access* sub-category are in light of this theoretically sorted as *Authors as Barriers*, *Financial Barriers*, *Technical Barriers*, and *Legal Barriers*. These *Barriers* affect how and if *Authors*, institutions and organisations adopt *Open Access*.

Sub-category: Barriers to open access
<p>Description This sub-category represents the theoretical sorting of concepts that reflects what obstacles that the <i>Open Access</i> movement are encountering in their progress of making the ideas of <i>Open Access</i> actualised as a progressive force in <i>Scholarly Communication</i>.</p>
Properties

Authors as barriers	Financial barriers	Technical barriers	Legal barriers
This property represents concepts of how <i>Authors</i> are hindering the progress of <i>Open Access</i> .	This property represents concepts that describes <i>barriers</i> to the realisation of <i>Open Access</i> set up for financial reasons.	This property represents concepts regarding technical use and requirements for managing <i>Open Access Manifestations</i> .	This property represents concepts that hinders the progress of <i>Open Access</i> regarding copyright and other legal issues.

Fig 8. The *Barriers to Open Access* sub-category.

3.1.3.1 Property: Authors as barriers

Authors as Barriers are the concept of how unawareness of the ideas, ideology, and *manifestations* of *Open Access* among *Authors* affects the movement's progress and implementations. In this property, *Authors* are disregarding the benefits and potential that *Open Access* offers that *Authors* gain through depositing in *Open Access Repositories* and publishing in *Open Access Journals* which we will see below in the *Benefits of Open Access* sub-category. *Authors* act as barriers due to the traditional culture and reward systems that shape different scientific disciplines. One expression of this is how *Authors* might be unwilling to deposit their content if other content present in the same outlet are not peer-reviewed, such as in medicine. This is also related to issues about tenure and promotion which is described more thoroughly in the *Authors* category. The suggestions to tackle this are for *Libraries and Librarians* to engage in *Advocacy* and education about *Open Access* and its *manifestations*.

Property: Authors as barriers
Description This property represents concepts of how <i>Authors</i> are hindering the progress of <i>Open Access</i> .
Summary of relational statements:
<ul style="list-style-type: none"> • Through lacking in <i>awareness</i> about the <i>Open Access manifestations</i> and being locked down by traditional reward systems and research cultures, <i>Authors</i> are affecting the progress of the <i>Open Access</i> movement negatively by not engaging with the <i>manifestations</i> that requires their content to be successful. • <i>Authors as Barriers</i> can be bridged through <i>Libraries and Librarians</i> engaging in <i>Advocacy</i> to raise the <i>awareness</i> needed for <i>Authors</i> to engage.

Fig 9. The *Authors as Barriers* property.

3.1.3.2 Property: Financial barriers

The green *manifestation* of *Open Access* has a significant *Barrier* to its progress through the embargoes that the *Commercial Publishers* imposes on the content that *Authors as Content Providers* deposit in *Open Access Repositories*. One excerpt describes colourfully the embargoes as a pie that one could slice in “whichever way you wish, it

still satisfies only the publisher appetite for protecting access-based revenue which, in turn, pre-empts any *Open Access* efforts to decrease subscription fees” (Rizor & Holley 2014, pp. 331). Embargoes are here seen as undermining the *Open Access* efforts to decrease subscription costs, as *Commercial Publishers* retain the access to relevant knowledge, and can therefore request payment for it. Mentioning this *barrier* to the green *manifestation* of *Open Access* is seen as somewhat heretical in the library world. This is because it states that when the gold *manifestation* is compared to the green, gold is seemingly doing a better job of fulfilling the original goals of the *Open Access* movement as we have seen in the *Manifestations of Open Access* sub-category above.

Gold *manifestations* have problems with *Commercial Publishers'* manipulation of gold *Open Access* principles, which can create a profitable situation for them through author fees. One illustrative example of this found in the excerpts, are how the publisher Emerald's policy was changed to allow *Authors* to *Self-archive* content without fees if the *Self-archivation* were voluntary but not mandated. This change was done at the same time of the launch of Emerald's Gold *Open Access* option were the author fees for publishing in their journals cost \$1,595 per article (Rizor & Holley 2014). *Librarians* and other *Open Access* proponents are encouraged to confront this kind of behaviour from *Commercial Publishers*. In the case of Emerald, their activities forced *Authors* who wished to publish in an Emerald publication, and who works in institutions or funding bodies that issues mandates, to either pay this author fee or endure a two-year embargo. This is a situation in *Scholarly Communication* that is strengthening *Commercial Publishers*, and is counteractive to what the *Open Access* movement is trying to accomplish. There is a worry that these commercial interests are distorting *Open Access* through restrictions and that *Open Access* ideals will not hold against this pressure.

There are also critics of the gold *manifestation* of *Open Access* that claims that the model is unsustainable as author fees are just as expensive as subscription fees. An early example of this is how Duke University in 2003 paid the same amount on author fees for publication of their social science and science faculty as they did on their entire cost for journals subscriptions (Rizor & Holley 2014).

Financial support for gold *Open Access* seems to be void where it is needed most, like in hard-on-cash disciplines such as humanities. This unfavourable position for the humanities are echoed in several excerpts. One example is Rizor & Holley 2014 who states that “[n]ot surprisingly, outside support for gold OA fees is lacking for researchers in disciplines like the humanities that often do not receive research funding” and also includes “researchers from developing or otherwise economically underprivileged countries” (pp. 329).

Property: Financial barriers
Description This property represents concepts that describes <i>barriers</i> to the realisation of <i>Open Access</i> set up for financial reasons.
Summary of relational statements:

- *Commercial Publishers* imposes embargoes on the content that *Authors as Content Providers* deposit in *Open Access Repositories* because it is in their commercial interest.
- *Commercial Publishers* manipulates the authors fees of the gold *manifestation* to gain revenue.
- Financial support for the gold *manifestations* are lacking for *Developing and Transitional Countries*.

Fig 10. The Financial Barriers property.

3.1.3.3 Property: Technical Barriers

Lack of technical know-how for *Librarians* renders even the most up-to-date and effective technological equipment useless as there is nobody with sufficient *skills* to use it. This may include anything from a lack of understanding how to deposit in a repository, or how to use a computer.

Indexing continues to be a barrier to the success of *Open Access* (see for example Ezema 2013; Martin 2010; Rizor & Holley 2014). The data suggested that when searching for *Open Access* content, even though full bibliographical information is available, there are still problems regarding the *Accessibility*, *Visibility*, and *Usability* of *Open Access* content. There are specialised search engines designed for searching *Open Access* material, such as WorldCat's OAIster (a worldwide union catalogue of open access resources that uses the *Open Archives Initiative Protocol for Metadata Harvesting* (OAI-PMH)), *Open Access Journal Search Engine* (OAJSE) and *Connecting REpositories* (CORE), but they do not index all *Open Access* content. *Open Access* is not worth much regarding *Usability* if it is not *Accessible*, here *Visibility* is key, meaning that the use of content being made available according to *Open Access* principles are limited if they are not visible and accessible with ease online.

There are also issues as fundamental as the availability of electricity and electronic equipment that, if not present, disallows the dissemination of *Open Access* content in any form. These barriers are mostly attributed to *Developing and Transitional Countries*, but of course is a fundamental prerequisite for any *Open Access* endeavour.

Property: Technical barriers
<p>Description This property represents concepts regarding technical use and requirements for managing <i>Open Access Manifestations</i>.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • If <i>Librarians</i> lack the proper skills regarding the development and management of the <i>Manifestations of Open Access</i> the <i>manifestations</i> will not be useful. • There are <i>Technical Barriers</i> that make the content being made available according to <i>Open Access</i> principles to have limited usability if they are not visible and accessible with ease online. • <i>Developing and Transitional Countries</i> may not have the needed technological infrastructure to

properly engage with the *Open Access* ideas.

Fig 11. The *Financial Barriers* property.

3.1.3.4 Property: Legal Barriers

Privacy and security are suggested to be important issues to address when aiming for *Open Access*. There is a need to be able to control unauthorised access, uncontrolled use, storage, copying and printing of content, depending on what type of *Open Access* or rights that has been set up in regard to the content, to be able to satisfy the wishes of *Authors as Copyright Owners*.

Rights of *Authors* might be unclear in an *Open Access* environment. For instance, there might be an uncertainty of how embargo periods work. Intellectual property is a complex issue that poses a great challenge to *Librarians*, because of *Authors* both as *Content Providers* and as *Researchers* have a fear of infringing on copyrighted material. This could pose a problem if an *Author* for instance released a copy of their published article on their own website after publishing the article in journals managed by *Commercial Publishers*, which would effectively result in infringement. SHERPA/RoMEO (*Securing a Hybrid Environment for Research Preservation and Access/Rights Metadata for Open Archiving*) is a project that works as a counter to this uncertainty by providing easy access online to different publisher policies regarding open access publishing and preservation rights (see for example Shotton 2012; Tsuchide, Nishizono, Suzuki, Sugita, Yamamoto & Uchijima 2013).

Through the embargoes that affects *Open Access Repositories*, copyright emerges as a barrier to the development of *Open Access* in *Developing and Transitional Countries* as the knowledge sharing between developing countries and developed countries are stopped effectively by them (see for example Ezema 2013).

Property: Legal barriers
Description This property represents concepts that hinders the progress of <i>Open Access</i> regarding copyright and other legal issues.
Summary of relational statements:
<ul style="list-style-type: none">• <i>Authors</i> right need to be addressed in the <i>Open Access</i> environment. Intellectual property is an issue that <i>Librarians</i> should be comfortable with so that <i>Authors</i> can navigate freely in this environment.• Embargoes hinders the free and open access to scholarly content between the developing and developed world.

Fig 12. The *Legal Barriers* property.

3.1.4 Sub-category: Benefits of open access

Benefits of Open Access are the beneficial aspects and effects of making *Scholarly Communication* available through *Open Access* ideas and principles. These aspects encourages and persuades *Libraries and Librarians* to engage in *Advocacy* for *Open Access*, and *Authors* to engage in *Open Access manifestations* through *Self-archivation* in *Open Access Repositories* and the publication of content in *Open Access Journals*. It also gives opportunities for *Developing and Transitional Countries* both to gain access to global research and to disseminate their local content to the global community. Through the adoption of *Open Access* ideas the *Accessibility* and *Visibility* of *Scholarly Communication* content is increased. Furthermore, *Open Access* also increases *Usability* of disseminated content as it allows users to read, download, share, store, print, link and cite the literature freely. This increase in *Availability*, *Usability*, and *Visibility* is a major driving force for the progress of *Open Access*, and sets the core-category *Open Access* in direct relationship with the category *Scholarly Communication*. If *Open Access* succeeds, *Commercial Publishers* will receive less content from *Authors as Content Providers*, which will ultimately cause a major shift from the subscription-based services they traditionally provide towards free and open information services. In turn this will result in a paradigm shift in how the *Authors as Content Providers* and *Researchers* create and use digital information. *Authors* will find more and easier access to scholarly information and data, which will bring a significant change in the way information is used for research and scholarly activities, and will in turn promote the creation of more and new knowledge. *Libraries and Librarians* will through this see an end to the *Serials Crisis* that severely affects the library budgets.

Sub-category: Benefits of open access		
Description		
This sub-category presents the concepts describing the <i>benefits</i> that the implementation of <i>Open Access</i> ideas in <i>Scholarly Communication</i> is offering different actors and <i>Scholarly Communication</i> in general.		
Properties		
Increase of accessibility	Increase of visibility	Increase of usability
These concepts describe the benefits of the implementation of <i>Open Access</i> ideas in <i>Scholarly Communication</i> regarding the increase of <i>accessibility</i> .	These concepts describe the benefits of the implementation of <i>Open Access</i> ideas in <i>Scholarly Communication</i> regarding the increase of <i>visibility</i> .	These concepts describe the benefits of the implementation of <i>Open Access</i> ideas in <i>Scholarly Communication</i> regarding the increase of <i>usability</i> .
Summary of relational statements:		
<ul style="list-style-type: none"> • The <i>benefits</i> of the implementation of <i>Open Access</i> ideas results in the engagement of <i>Libraries and Librarians</i> in <i>Advocacy</i> for <i>Open Access</i>. • The <i>benefits</i> of the implementation of <i>Open Access</i> ideas results in the engagement of <i>Authors</i> in the <i>Open Access manifestations</i>. • <i>Developing and Transitional Countries</i> gain access to global <i>Scholarly Communication</i> and can disseminate their research to this global community through the implementation of <i>Open Access</i> ideas. 		

- *Benefits of Open Access* can reform *Scholarly Communication* and create free and open access to research through ousting or circumventing *Commercial Publishers*. This happens as the contributions of *Authors as Content Providers* are increasingly finding *Open Access* as a suitable alternative to traditional *Scholarly Communication*.

Fig 13. The Benefits of Open Access sub-category.

3.1.4.1 Property: Increase of accessibility

The main benefit of *Open Access* is suggested to be that it solves the subscription problem that *Libraries* are the victims of. The subscriptions are a problem because of the dual role that *Libraries* inhabit, that they are both the suppliers and consumers of information. Before the introduction of *Open Access*, *Libraries* had no choice but to follow the whims of *Commercial Publishers*, in which *Libraries* had to work with the *Accessibility* and *Availability* that the *Commercial Publishers* afforded them. This is echoed in many excerpts, where *Open Access* is seen as the key contributor to providing universal access to information and knowledge, especially for *Developing and Transitional Countries*. It is important to compare the *Libraries*' view of the goals of open access to that of the goals stated in the BOAI, which did not directly declare that *Open Access* and its *manifestations* would become the saviours of *Libraries*. The savings that can be made for *Libraries* will never be viewed as important as the idea of the greater good that is the result of giving *Increased Accessibility* of *Scholarly Communication* through *Open Access* (see for example Rizer & Holley 2014).

Increased Accessibility leads to a faster advancement of scientific knowledge, which is argued to be followed by an advancement of commerce. This is a key argument suggested, that explains why *Scholarly Communication* should be made available through *Open Access*. Also, as *Scholarly Communication* is often funded by public means, it should therefore be available to the public free of charge as a common good. This altruistic idea is identified as a key component of *Advocacy* for *Open Access* targeted to its promotion among *Authors*. *Accessibility* of *Open Access* content can be prolonged, through digital *Preservation* strategies such as “Lots of Copies Keep Stuff Safe” (LOCKSS) or “Controlled Lots of Copies Keep Stuff Safe” (CLOCKSS) in the green *manifestation* of *Open Access* (see for example Borchert & Fielding 2014; Seadle 2011).

Property: Increased accessibility
Description This property represents the concepts about how the implementation of <i>Open Access</i> ideas in <i>Scholarly Communication</i> results in the accumulation of research is increased by an increase of <i>accessibility</i> .
Summary of relational statements:
<ul style="list-style-type: none"> • <i>Increased accessibility</i> can aid <i>Libraries</i> regarding the cost of subscriptions which in traditional <i>Scholarly Communication</i> are imposed and dictated by <i>Commercial Publishers</i>. • <i>Open Access</i> ideas never implied that <i>Libraries</i> would be saved by their implementation.

- *Scholarly Communication* can be accumulated faster through the *Increased Accessibility*, aiding the progress of research.
- The altruistic idea of providing *Scholarly Communication* funded by public means is a key component of the *Advocacy* for *Open Access* targeted to *Authors* by *Librarians*.
- The green *manifestation* of *Open Access* aids accessibility of *Scholarly Communication* through its *Preservation* capabilities.

Fig 14. The *Increased Accessibility* property.

3.1.4.2 Property: Increase of visibility

Open Access also gives *Authors* an increased *Visibility* of their contributed content, which results in the increase of their *Readership* and thus the impact of their research, which is shown in increased download statistics and citations. Through the reduction of the global cost of scientific publication when compared to the subscription model, *Open Access manifestations* also eases the financial restraints of under-funded research, such as in *Developing and Transitional Countries*, which gives promises about an increased *Visibility* of scientific content produced locally on a global scale for under-privileged research institutions. Enhanced impact is thus made possible by the combined potential of digital content, internet and *Open Access*. Here *Open Access* is seen as the primary solution that allows the low-cost dissemination of *Scholarly Communication* through the removal of restrictions that exists on access to it that is imposed by *Commercial Publishers*.

Property: Increase of visibility
<p>Description The concepts representing the <i>Increased Visibility</i> property regards how <i>Scholarly Communication</i> disseminated according to <i>Open Access</i> principles results in research finding new and wider audiences, thus raising its impact.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • <i>Authors</i> gain an increased <i>Readership</i> through the <i>Increased Visibility</i> of their research. • <i>Open Access manifestations</i> as a tool for promotion offers an <i>Increased Visibility</i> of research output produced in under-privileged institutions and countries. • <i>Open Access Manifestations</i> provides a low-cost dissemination of <i>Scholarly Communication</i> through the removal of restrictions upheld by <i>Commercial Publishers</i>.

Fig. 15. The *Increase of Visibility* property.

3.1.4.3 Property: Increase of usability

Open Access empowers anyone to read, download and distribute and make use of the literature due to its free availability and lack of access barriers. Furthermore, the *Open Access Repositories* provides free availability of archived material as they also functions as vehicles for *Preservation*. That is, if *Authors as Content Providers* engage with *Self-archivation*, this makes it more likely that their work can be used in future research by *Authors as Researchers*.

Property: Increase of usability
<p>Description <i>Open Access</i> ideas provides a free and open use of <i>Scholarly Communication</i> that is also perpetual as it offers <i>Preservation</i> of content.</p>
<p>Summary of relational statements:</p>
<p><i>Authors as Content Providers</i> engage with <i>Self-archivation</i> that allows <i>Preservation</i> of their content which can later be used by <i>Authors as Researchers</i> in future research.</p>

Fig 16. The Increase of Usability property.

3.2 Categories

The categories below are the theoretical sorting of concepts into categories that reflect the secondary research question. They are related to the core-category as the subjects represented by them are engaged directly or indirectly with the ideas, *manifestations*, *barriers* and *benefits* that the *Open Access* core-category represents. Their relationships to the core-category can be seen above in Figure 1.

3.2.1 Category: Authors

It is the *Authors* that will shape the future of *Open Access* through their actions or inaction. *Authors* have dual roles in their interactions with *Open Access*. They are the main contributors of content in their role as *Content Providers* to the two manifestations of *Open Access*; *Open Access Repositories* and *Open Access Journals*. Their contributions to *Open Access* are made through the acts of *Self-archivation* and publication in *Open Access Journals* as seen in Figure 4 above. It is through these acts the success or failure of *Open Access* as a pervasive ideology of and tool for *Scholarly Communication* is determined. They are also the key users of *Open Access* content in their role as *Researchers*. The decision of where, when and if to publish or deposit is made by the *Authors* themselves, but can be influenced by mandates and policies, research culture, psychology, and *Advocacy*. *Advocacy* is discussed in the *Libraries and Librarians* category. Other factors are economic considerations, legal agreements, and through the influence of other *Authors*. Their interactions and alignment with *Open Access* values are elaborated in the sub-categories *Attitudes to Open Access* and *Open Access Behaviour*.

The engagement of *Authors* in *Open Access* is low because of a lack of knowledge, time pressures, and issues that stem from publication agreements with *Commercial Publishers*, and the anxiety of publishing in uncharted territory. Initiatives have identified the need for a proactive role to counter this, and are today guiding *Authors* in the *Open Access* copyright environment, trying to ease the investment of effort needed to make their works available in *Open Access* for the public good. It seems that this lack of engagement in the *Open Access Scholarly Communication* environment is not tied to age, as younger *Authors* are not providing their content despite their assumed engagement with digital technologies (Steele 2014).

Category: Authors	
Description This category is the theoretical sorting of concepts regarding the stance that <i>Authors</i> take regarding <i>Open Access</i> and the issues that <i>Authors</i> may perceive and what influences them in their interaction with the movements <i>manifestations</i> .	
Authors as content providers	Authors as researchers
These concepts specifies how <i>Authors</i> interact with the <i>Manifestations of Open Access</i> .	These concepts specifies how <i>Authors</i> are impacted by the <i>Benefits of Open Access</i> and uses the content contributed to the <i>Manifestations of Open Access</i> by <i>Authors as Content Providers</i> .

Fig 17. The Authors category.

Sub-categories		
Readership	Attitudes to open access	Open access behaviour
<p>Description This sub-category is the representation of the theoretical sorting of concepts that regards how <i>Open Access</i> affect the impact of the dissemination of the <i>Authors'</i> scholarly content.</p>	<p>Description The concepts conceptually ordered and represented in this sub-category regard the stances that <i>Authors</i> take regarding the ideas and <i>manifestations</i> of <i>Open Access</i> and why.</p>	<p>Description The theoretical sorting in this sub-category regards what <i>Authors</i> actually do in their interactions with the <i>Manifestations of Open Access</i> and why.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • It is the actions of <i>Authors</i> that will determine the future and success of <i>Open Access</i> as an ideology of <i>Scholarly Communication</i>. • <i>Authors as Content Providers</i> are the main source of content in the <i>Manifestations of Open Access</i>. • <i>Authors</i> are the main user of content being made <i>Open Access</i> in their role as as <i>Researchers</i>. • The contribution of <i>Authors as Content Providers</i> can be influenced positively by <i>Advocacy by Librarians</i> as well as other <i>Authors</i>. • The contribution of <i>Authors as Content Providers</i> can be influenced negatively by a lack of <i>awareness</i> and the interference from agreements stemming form <i>Commercial Publishers</i>. 		

Fig 17 (cont.).

3.2.1.1 Sub-category: Readership

Authors as both *Content Providers* and *Researchers* benefits from *Open Access* through the enhanced dissemination of ideas and research through its *Increased Visibility* and *Accessibility*. *Authors as Researchers* benefits from *Open Access* by gaining access to the ideas and research at a higher speed than without (*accessibility*), while *Authors as Content Providers* receives a greater *Readership* that enables *Authors* to gain tenure and promotion (*visibility*).

The *Authors' Readership* sub-category can be wide or narrow. This relates to the beneficial properties of the *Open Access* category discussed in the *Increased Visibility* property such as the reported, but disputed, citation advantages. *Authors* are related to *Open Access Journals* as the journals are major outlets for publication and therefore offer promises of increased *Readership*. *Authors* want to permit educational and non-commercial reproduction of their articles, but current publication models limits their *Readership*. *Open Access* is therefore considered beneficial for the *Readership* sub-category of *Authors*.

Authors as Content Providers recognise the potential benefits of *Institutional Repositories* depositing in that they receive the potential of a greater exposure of their work through indexing in channels such as Google Scholar and other research discovery

tools. The impact of their research can potentially be greater as *Open Access* allows access to their works to researchers in both government and private organisation that would not have it otherwise. Also, when depositing, the archiving function that repositories provide will allow future retrieval, and could be used by the same *Authors* when they are preparing for funding and promotion. Depositing in electronic thesis and dissertation repositories, a sub-set of *Open Access Repositories*, also gives doctoral students and postgraduates the possibility to receive feedback on their work (Stanton & Liew 2011).

Sub-category: Readership
<p>Description This sub-category is the representation of the theoretical sorting of concepts that regards how <i>Open Access</i> affect the impact of the dissemination of the <i>Authors'</i> scholarly content.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • <i>Authors as Content Providers</i> benefits from <i>Open Access</i> through the <i>Increased Visibility</i> made possible by <i>Open Access Repositories</i> such as <i>Institutional Repositories</i> which index the <i>Authors</i> content and the <i>Increased Accessibility</i> provided by their <i>Preservation</i> capabilities. • <i>Authors as Researchers</i> benefits from <i>Open Access</i> through <i>Increased Accessibility</i>.

Fig 18. The Readership sub-category.

3.2.1.2 Sub-category: Attitudes to open access

Among *Authors* the altruistic intent of *Open Access* in making research available to the wider public and removing the cost for access is recognised as something preferable and is seen as a chief reason for the implementation of *Open Access*. It works as a powerful incentive that provides a factor for deposition of content in *Open Access Repositories* and publishing in *Open Access Journals*. *Authors* preference for free dissemination for the common good is by the data recognised as a key point to be used for marketing and *Advocacy*.

Authors' Attitudes to Open Access are described as being in conflict with their *Open Access Behaviour*. That *Authors* tend to agree with the fundamental principles and intentions of *Open Access* does not equal their *Compliance*. Actually, *Authors* are suggested to be rather reserved in their implementations of the ideas that they support. This were in an excerpt described as an example of a Jekyll and Hyde syndrome that *Authors* can show which “is where the individual researcher, divorced from institutional responsibility, adopts one attitude as an author and another as a reader“ (Steele 2014, pp. 243). This Jekyll and Hyde syndrome can be seen, for example, in the *Open Access Repositories* property above, where the paradox of how *Authors'* genuinely positive *attitudes* towards the principles and benefits of *Open Access* publishing coupled with their observed reluctance to submit content in *Institutional Repositories* are made clear. The same is noted when *Authors* engages with the technology that facilitates *Open Access* content, which are deemed impractical by the *Authors* and therefore abandoned. This is something that is reported to be quite widespread among the majority of

Authors, and across the spectrum of developed and *Developing and Transitional Countries* as well.

Authors are suggested to be the opinion leaders of the *Institutional Repositories* movement. It is recognised that they are able to influence each other to participate in *Institutional Repositories* through *Self-archivation*. Collegiality are here acting as determinant for whether *Author as Content Providers* will deposit. For instance, *Authors*, when they are students, are highly influenced by their supervisors when deciding where to publish. They simply publish where their supervisors recommend that they publish (Stanton & Liew 2011). This show how much influence *Authors* as a group can have over each other, and therefore also the importance of *Librarians* to raise the *Awareness* among *Authors* as a group through *Advocacy*. Again, the ethos of *Open Access* is understood and supported by the scholars that the *Authors* category represent, but it is not certain this means that this would result in an increased rate of the *Self-archivation*.

The conflicting relationship between the properties of *attitudes* and *behaviours* are seen in the data where *Authors as Content Providers* have a fear that *Open Access* publishing might negatively affect the impact of the articles they publish. Due to this they are reluctant to engage in *Open Access*. Although, as the movement progresses, the *Benefits of Open Access* are becoming increasingly obvious, while the drawbacks are overcome. This is suggested to, through the passage of time, lead to a higher acceptance of *Open Access* among *Authors*.

Although there are indications of a general increase of acceptance to *Open Access* today, this acceptance varies between academic disciplines. The discipline to which *Authors* belong shapes the *Awareness* and use of, for instance, *Open Access Repositories*, mainly due to the unique work-flows that are associated with a discipline. Disciplines shape also where researchers deposit their content, if it is in an *Institutional Repositories* or a *Subject Repository*. Citation rates are also an important factor that determines *Authors' Attitudes to Open Access*. This is found to be important mainly to researchers of social sciences, humanities and the arts. Researchers in social sciences and humanities are also suggested to be unsure about the meaning of *Open Access*, where the principles of *Open Access* mainly reflect free access. Reputation building is another important motivator for depositing, as this can be seen as a career development but is less important for *Authors* in medicine, physical sciences and mathematics (Creaser, Fry, Greenwood, H., Oppenheim, Proberts, Spezi, & White 2010).

When publishing content as *Open Access*, *Authors as Content Providers* expect certain outcomes. They expect that the content will be easier to obtain for others, that libraries will have more money to spend, that they will be able to publish more often, that fewer articles will be rejected, and that the quality of content of the chosen outlet will improve over time. *Authors'* primary motivation to publish is not to earn profit, but to reach tenure and promotion. Subscription based journals are therefore still an important outlet for *Authors*, where they can publish to reach this tenure and promotion. There might be anxiety regarding that this possibility are not properly addressed when publishing in an *Open Access* environment.

There are two related dimensions that are found within the *Attitude to Open Access* property. First, the positive-negative dimension in which *Authors* on the negative end of the dimension tend to associate *Open Access* with low quality material that is not peer-reviewed, not the final version of an article or vanity publishing, while the positive end of the spectrum lifts the altruistic, “for the common good”, aspects of the *Open Access* mission.

The positive-negative dimension correlates heavily with the second dimension, *Awareness*, in which *Authors* are *Aware* or *Unaware* of *Open Access*. When *Authors as Content Providers* chooses outlets for publication of their works, their choices are guided first and foremost by the reputation of the journal, and then by the aim for a wide *Readership* and journals with a high impact factor. This tie in with the fact that it is the careers of *Authors* that are the main motivator for their choices of where to publish. This suggests that the *Benefits of Open Access* that are championed by open access proponents is not the true motivation to engage in *Open Access* activities by *Authors as Content Providers*. Although, when *Authors'* awareness of *Open Access* increases, there is indication of that this also increases their participation through the act of publishing in *Open Access Journals* and deposition in *Open Access Repositories* through *Self-archivation*. This makes the *Awareness* dimension relate to both the *Attitudes to Open Access* and the *Open Access Behaviour* sub-categories, creating a bridge between the *attitudes* and *behaviours* of *Authors* regarding *Open Access*.

Important to point out is that *Authors* in general are still unaware of *Open Access*, both regarding deposition and publishing. The data have described that the *awareness* of *Authors* of *Open Access* is a fallacy (Zainab 2010). To many *Authors* *Open Access* can and often mean only the gold manifestation of *Open Access* which makes makes *Authors* less likely to *Self-archive* in an *Open Access Repository*.

Sub-category: Attitudes to open access
<p>Description The concepts conceptually ordered to represent this sub-category regard the stances that <i>Authors</i> take regarding the ideas and <i>manifestations</i> of <i>Open Access</i> and why.</p>
Dimensions of the Attitude to open access property
<p>Description The two dimensions of the <i>Attitudes</i> sub-category measures how <i>Authors</i> perceive and how aware they are of <i>Open Access</i> ideas and <i>manifestations</i>. These dimensions are highly intertwined. The first dimension, regarding whether <i>Authors</i> has a positive or negative perception of <i>Open Access</i> are correlated to them being <i>aware</i> or <i>unaware</i> of the ideas and <i>manifestations</i> of the movement. If <i>aware</i> it is likely they will have a positive view, and vice versa. This in turn influence their <i>Open Access Behaviour</i>.</p>

Fig 19. The Attitudes to Open Access sub-category.

Summary of relational statements:

- The altruistic intent of *Open Access* regarding *Increased Accessibility of Scholarly Communication* to the wider public is perceived positively by *Authors* and is a key point for *Librarians* engaged in *Advocacy* for *Open Access* ideas and *manifestations*. But it is also important to note that the *Benefits of Open Access* are not the true motivation to engage in *Open Access* activities by *Authors as Content Providers*. *Authors as Content Providers* primary motivation to publish or deposit is to reach tenure and promotion. *Open Access manifestations* need to accommodate this to truly benefit the movement.
- *Authors' Attitudes to Open Access* and their *Open Access Behaviour* is in conflict, which is shown in how *Authors* tend to agree with the fundamental principles and intentions of *Open Access* but does not *comply* in their role as *Content Providers*. This conflict is seen in *Developing and Transitional Countries* as well.
- The *Awareness* dimension of *Authors' Attitudes to Open Access* combined with their ability to influence each other to *comply* with *Open Access* as *Content Providers* shows the importance of *Librarians* to raise the *Awareness* among *Authors* as a group through *Advocacy*.
- As *Benefits of Open Access* are becoming apparent, the acceptance of *Open Access* ideas will increase among *Authors*.
- When *Authors' awareness* of *Open Access* increases, this increases their engagement with the *Open Access manifestations*.

Fig 19 (cont.).

3.2.1.3 Sub-category: Open access behaviour

The main point of the *Open Access Behaviour* sub-category is that it is the choices of *Authors as Content Providers* that will shape the future of *Open Access*. For the progress of the movement, efforts are needed to raise the *awareness* and educate *Authors* about mandates, policies, publishing and the ideas of *Open Access*, which is done mainly by *Libraries and Librarians* but also those *Authors* that are themselves proponents of the principles of the movement. This shapes the *behaviours* of *Authors* and is therefore central to the success of *Open Access*.

Authors suffer from what can be labelled as the publish or perish syndrome (see for example Steele 2010; Zhao 2014). They are pressured to publish due to the fact that scholarly publication and citation counts are used as main indicators or determinants in measuring academic skill and productivity, which is then used as a background to achieve tenure and promotion. This is something that needs to be confronted, as it traps the *Authors* publishing activities because of the inability of institutions and organisations to offer alternatives. As *Authors* are a vital part of both *Scholarly Communication* and *Open Access*, they should be offered alternatives. This publish or perish syndrome have made some *Commercial Publishers*, as we will see in the *Scholarly Communication* category, to take advantage of this stressful situation to gain revenue through author fees and manipulation.

Open Access is reported by the data to have profoundly changed *Authors as Content Providers* publishing behaviour, where the social values, the altruism, or the “common good”, and the philosophy that underpins *Open Access* should not be underestimated in the effect it has on *Authors*. Regarding the *Benefits of Open Access*, the data suggests that *Authors* are mainly motivated by the possibility of *Increased Visibility*, with its potential of and providing the *Authors* with an increased *Readership*. If *Authors* dismiss *Open Access* entirely, this would limit their publishing options, potential *Visibility* and their *Readership*.

For *Authors*, *Self-archivation* is a way to increase the *Accessibility* of their research, but *Authors* are reluctant to deposit in *Institutional Repositories* because of the fear or anxieties regarding copyright and licensing as found in the *Legal Barriers* property. This fear could be handled by establishing mandates and policies that clearly states how copyright is handled and the options that the *Authors* have. But the data also reports that *Authors* perceives a conflict between the established mandates and policies that coerce them to deposit and the pressure of institutions to publish in a high impact factor journals. Here projects such as Sherpa/RoMEO functions as tools that can be employed by *Libraries and Librarians* to ease the processes of rights management and provides information about publishing for *Authors* and managers of *Open Access Repositories* (see for example Shotton 2012; Tsuchide, Nishizono, Suzuki, Sugita, Yamamoto & Uchijima 2013). Such tools is useful also where the behaviour of *Authors* might be influenced by *Commercial Publishers* due to conflicts regarding prior publication agreements that they have made with them, which make them unable to comply with deposition.

Authors concerns of *Self-archivation* in *Institutional Repositories* are about the ability to publish with a *Commercial Publisher* after the deposition of a pre-print, which is key concern about the potential conflicts of interest that that can show up between *Open Access* proponents such as *Libraries and Librarians* and the professional realities of the *Authors*. This is related to what is suggested above, where the reason for *Authors* to publish is tenure and promotion, not profit. There are also concern of copyright, provenance and quality control, especially infringement and plagiarism. Another concern is that the support of *Open Access* publishing as a concept is not consistent through the passage of time (as suggested by Stanton & Liew 2011).

The data suggest a *Compliance dimension* of the property *Open Access Behaviour* that make *Authors* either *Compliant* or *Non-Compliant*. If *compliant*, the *Authors* comply with the *Open Access* philosophy, an open research culture, mandates or other *Open Access* policies that institution or funding bodies sets up that prompts *Authors* to deposit or publish works through *Open Access* channels. If *non-compliant*, the *Authors* are resisting *Open Access* due to anxiety, unawareness, tradition, impractically or economic reasons.

An example of *non-compliance* is that the act of *Self-archivation* does not just happen. Deposition in a *repository* is a voluntary process, and *Authors as Content Providers* is by the data argued to require a continuous coercion and persuasion by *Libraries and*

Librarians to comply with deposition. *Authors* can also be influenced to *Non-Compliance*, such as when *Authors as Content Providers* or the funding bodies of their research simply are not willing to pay (or cannot pay) the author fees in the case of *Open Access Journals* because of the high costs associated (see for example Rizor & Holley 2014; Robertson & Simser 2013). Regarding *Non-Compliance* due to practicality, it has been suggested that *Authors* are tend to not *Self-archive* their work more than once, which suggests that efforts need to be made to make the process more intuitive and simpler, or even automated (suggested by Puplett 2010).

Sub-category: Open access behaviour
<p>Description The theoretical sorting in this sub-category regards what <i>Authors</i> actually do in their interactions with the <i>Manifestations of Open Access</i> and why.</p>
Dimension of the open access behaviour sub-category
<p>The <i>Compliance</i> dimension of the <i>Open Access Behaviour</i> sub-category is binary. Either the <i>Authors</i> comply, or they don't. Although, it is important to note who complies and when, or when they don't, as the circumstance that dictate when they do is of significance for the progress of <i>Open Access</i>. If <i>Authors</i> are <i>compliant</i>, they are in tune with the <i>Open Access</i> ideas and deposit or publish in the <i>Manifestations of Open Access</i>. If they are <i>non-compliant</i> they are not contributing content and is not in line with the <i>Open Access</i> ideas.</p>
Summary of relational statements:
<ul style="list-style-type: none"> • <i>Authors' Open Access Behaviour</i> will dictate the future of <i>Open Access</i>. If the movement wants to progress there is need to raise <i>awareness</i> and educate <i>Authors</i> about the ideas and circumstances of <i>Open Access</i>, which is mainly performed by <i>Libraries and Librarians</i> through <i>Advocacy</i>. • <i>Librarians</i> are required to continuously <i>Advocate</i> and coerce <i>Authors as Content Providers</i> for them to <i>comply</i> with the act of <i>Self-archivation</i>. • <i>Legal Barriers</i> creates anxieties for <i>Authors</i> regarding the act of <i>Self-archivation</i>, making them <i>non-compliant</i>. This can be handled by the <i>Libraries and Librarians</i> through providing services regarding publishing. • <i>Increased Visibility</i>, with its potential of and providing <i>Authors</i> with an increased <i>Readership</i> and by this increasing the <i>Authors'</i> chances for tenure and promotion, is the main reason for them to engage with <i>Open Access manifestations</i>. • <i>Commercial Publishers</i> can take advantage of the anxieties that <i>Authors</i> have in their publishing <i>behaviour</i>, regarding the use of author fees.

Fig 20. The Open Access Behaviour sub-category.

3.2.2 Category: Scholarly Communication

The definitions of *Scholarly Communication* in the data are few, but where it is found *Scholarly Communication* is as a system for the creation, evaluation and dissemination

of scholarly content for the scholarly community, and the *Preservation* of this content for future use (Chowdhury 2014a). *Scholarly Communication* is locked in a historical paradigm that is ignoring the opportunities that the digital environment provides, where *Open Access* offers a progressive alternative. The data is also pointing to the increasingly more significant role that *Libraries* are playing in this new *Scholarly Communication* landscape that *Open Access* is creating.

Free access to all science literature not only has substantial value to *Authors as Researchers*, but also to other scientists and researchers found in the private sector. This makes *Open Access* a gain to science as well as a potential contribution to the economy and the society of the country that implements it.

A point made in an excerpts is that access to the totality of scholarly content is decreasing despite the technological advances made, where a global provision is possible because of increased capacity (Jones 2013). *Open Access* is in this context a way in which *Libraries and Librarians* can ensure *Accessibility* to this content.

The traditional *Scholarly Communication* model for publishing rests on a stable triangle among the key players *Authors*, *Commercial Publishers* and *Libraries*, established through years of negotiation and practice (as suggested by Zhao 2014). While previous electronic publishing has only simulated this traditional model, it is today fundamentally challenged through the advent of *Open Access* and the movement's *manifestations*. *Scholarly Communication* is in current times a fast changing world, with rapid advancements in the area of electronic publishing, where *Open Access* of scholarly content without cost to the reader is a promising innovation. The current *Scholarly Communication* publishing environment is in a rapid development that provides challenge, opportunity, and transition for all actors involved. There is an overwhelming amount of *Scholarly Communication* output today, and a wide range of options for *Authors* to choose from for their research dissemination.

The advancement of technology and the significant development of the web in combination with the ideology of *Open Access* have created attractive opportunities for people to communicate and exchange information in new ways. One excerpts points out that it is interesting that the web has vastly succeeded in disrupting industries such as book stores, telecommunications, matchmaking services, newspapers, pornography, stock trading, music distribution, and others, but failed to disrupt scientific research, which were the main outset of the development of the web (Steele 2014, pp. 242). However, *Open Access* has grown to be a major part of the way in which *Authors* interacts in their *Scholarly Communication* for both dissemination and use. The same technology that supports the *Commercial Publisher* domination over *Scholarly Communication* has now made it possible for institutions, *Authors*, and *Libraries* to assume control of electronic works and expand the *Availability* of the works to everyone.

Peer-review is viewed as essential to *Scholarly Communication* and the validation of results. As an example, an excerpt reports that in the medical sciences, if an article has

not been peer-reviewed, it will be treated with skepticism (see for example Creaser 2010). This ties peer-review to the disciplinary circumstances that fosters *compliance* in specific disciplines, as described above in the *Attitudes to Open Access* property of the category *Authors*. Several suggestions to employ peer-review outside of the traditional journals setting are found during the analysis, where the use of Web 2.0 tools is a vital part of the realisation of this.

Open Access is championed in the literature as the new mode of *Scholarly Communication*. In this new mode *Open Access Repositories* are considered by their advocates as the main solution regarding future dissemination of *Scholarly Communication*. As digital libraries develops and adopts new technology and *Open Access* services this will result in emergent utilities for *Scholarly Communication*. The actors that are making this happen, as we have already seen, are not the *Libraries and Librarians*, but the *Authors as Content Providers* through their engagement with these technologies and ideas. Therefore it is important for proponents of *Open Access* to establish recognition functions that persuades *non-compliant Authors* to get involved in the evolving *Scholarly Communication* landscape. This landscape is bestowing *Authors* the right to disseminate, through rights retention, their content as they see fit. It is also allowing *Authors* to disseminate to a wider audience of readers than has been previously possible in the traditional mode of *Scholarly Communication*. As we saw in the *Open Access core-category*, there are prediction that the future of *Scholarly Communication* will be dominated by *Open Access Journals* and *Open Access Repositories* as channels for communication.

Category: Scholarly communication			
Description This category is the theoretical sorting of concepts that reflect how <i>Scholarly Communication</i> can be and are changed and influenced by the implementation of <i>Open Access</i> ideas and the <i>Open Access manifestations</i> .			
Sub-categories			
Commercial publishers	Availability	Visibility	Preservation
Description This sub-category represents the theoretical sorting of concepts that describe how commercial actors in <i>Scholarly Communication</i> are affected by and reacting to <i>Open Access</i> .	Description This sub-category represents the theoretical sorting of concepts that describe the relationship between the <i>Availability</i> of <i>Scholarly Communication</i> and other categories.	Description This sub-category represents the theoretical sorting of concepts that describe the relationship between the <i>Visibility</i> of <i>Scholarly Communication</i> and other categories.	Description This sub-category represents the theoretical sorting of concepts that describe the relationship between the <i>Preservation</i> of <i>Scholarly Communication</i> and other categories.

Fig 21. The *Scholarly Communication* category.

Summary of relational statements:

- *Open Access* is a new progressive mode and an innovation of the dissemination of *Scholarly Communication*.
- *Scholarly Communication* publishing has been reformed by the introduction of the *Open Access* manifestations.
- The future of *Scholarly Communication* will be *Open Access*.
- *Authors* are the key to the success of *Open Access* as a new mode of *Scholarly communication*.
- *Libraries* are assuming a central role in *Scholarly Communication* through their engagement with *Open Access* in which they can ensure *Accessibility* to *Scholarly Communication*.
- *Authors* are reaching a wider audience of readers through *Open Access* based *Scholarly Communication*.
- *Open Access* is now a major part of *Authors'* interactions with *Scholarly Communication* both regarding use and dissemination.
- *Authors* and *Libraries* are assuming control of *Scholarly Communication* from *Commercial Publishers* through *Open Access*.
- The traditional *Scholarly Communication* model that tied *Authors*, *Commercial Publishers* and *Libraries* together are broken by the introduction of *Open Access* ideas.

Fig 21(cont.).

3.2.2.1 Sub-category: Commercial publishers

Commercial Publishers are in the data often discussed as the remnants of the former model of *Scholarly Communication*, in which they were an essential part of dissemination of scholarly content. This, the data suggests, is due to technical progress not the case any more. Technology is making it possible to disseminate content in new ways, were *Open Access* is a promising contribution. In this new *Scholarly Communication* landscape, shaped by *Open Access*, all publishers, whether they are commercial actors or otherwise, would need to stay competitive to be able to secure good scholarly content by keeping their fees competitive and offering and developing quality value-added services such as enhanced peer-review, editing, formatting, and other features (as suggested by for instance King 2010). As we have seen in the *Authors* category, it is their choices, based on likely use and relevance, and the perceived chances for tenure and promotion that determines which outlet, *Open Access* or not, that will receive their works.

Commercial Publishers are currently using technologies like the internet as a convenient platform for publication and distribution, but they are, despite their role in the traditional *Scholarly Communication* model, increasingly partaking in the *Open*

Access form of Scholarly Communication. The technology that makes electronic publishing possible is forcing *Commercial Publishers* to innovate their business models and marketing policies as entities such as *Libraries* also are taking part in the publishing of *Scholarly Communication*. A few of the major publishers such as Springer, Elsevier, ISI Thomson and Wiley-Blackwell have already declared their support of *Open Access* (Cimen 2012).

When *Commercial Publishers* are discussed in the data, it is clear that it is most often in their role as commercial agents, in one excerpts described as “‘know-biz,’ that is, managing scholarly works as a commodity” (Jones 2013, pp. 454). So, the data points to how *Commercial Publishers* in their commercial endeavours commodify knowledge and information to the end of maximising profits. This approach is suggested to result in a focus on the competitive value of knowledge and information, while ignoring the accumulative value that benefits research directly as seen in the *Increased Accessibility* property. This is argued by the data to be harmful not only to *Scholarly Communication* itself but to *Libraries and Librarians* in particular as their already strapped budgets are strained even more because of the economic pressures created by *Commercial Publishers*. *Authors* are harmed by the actions of *Commercial Publishers* in their role as *Copyright Owners* when they give up their publishing rights, but especially *Authors as Researchers* as the dissemination of new knowledge and ideas are hampered, and quick dissemination is reflected as crucial for the advancement of science. One excerpt stated that what Oldenburg (1665) wrote in the first scholarly journal, that contributors were:

“invited and encouraged to search, try, and find out new things, impart their knowledge to one another, and contribute what they can to the Grand design of improving Natural knowledge... all for the glory of God, the Honour and Advantage of these Kingdoms, and the Universal Good of Mankind” (quoted in Steele 2014, pp. 241)

Steele then states morbidly that:

"Serving God has now perhaps become serving Mammon and the ‘Universal Good of Mankind’ has become the watchword of the Open Access (*Open Access*) movement" (Ibid.)

Commercial Publishers have the possibility to make *Authors* pay for the *Open Access* publication of their works through author-fees, also known as articles processing fees, which are often covered often by parent organisations and institutions. This is most often done in so called hybrid journals, which means journals that are allowing articles published as *Open Access* after the payment of the processing fee, while in the same journal also allowing content to be submitted as non-open access, which need a subscription to be accessed. Hybrid journals are both popular and more expansive than their full *Open Access* counterparts. Another possibility that *Commercial Publishers* have are journals that impose an embargo period on articles that states a time period the articles has to be non-open access before the access *barriers* are removed, which is what often is the case of *Authors* works that has been deposited in *Open Access Repositories*.

Sub-category: Commercial publishers
<p>Description This sub-category represents the theoretical sorting of concepts that describe how commercial actors in <i>Scholarly Communication</i> are affected by and reacting to <i>Open Access</i>.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • <i>Commercial Publishers</i> are remnants of a previous models of <i>Scholarly Communication</i>, which is due to the introduction of <i>Open Access</i> ideas in <i>Scholarly Communication</i> obsolete. • Through the choices made by <i>Authors</i> it will be determined if <i>Commercial Publishers</i> will retain their control of <i>Scholarly Communication</i> or if <i>Open Access</i> will emerge as the preferred alternative for dissemination. • <i>Commercial Publishers</i> are increasingly partaking in the <i>Open Access</i> form of <i>Scholarly Communication</i> as the transformation of electronic publishing are forcing <i>Commercial Publishers</i> to innovate. • <i>Libraries</i> are competing with <i>Commercial Publishers</i> regarding the dissemination of <i>Scholarly Communication</i>. • <i>Commercial Publishers</i>' commodification of knowledge and information through their focus on its competitive value is clashing with the ideas of <i>Open Access</i> as seen in the <i>Increased Accessibility</i> property. This is argued to be harmful for <i>Scholarly Communication</i>, as the accumulation of research is slowed and to <i>Libraries and Librarians</i> that needs to pay for access. This in turn harms <i>Authors as Researchers</i> as they don't gain access to needed content as quick as they could. • <i>Commercial Publishers</i> make <i>Authors</i> pay for <i>Open Access</i> publication through author-fees. • <i>Commercial Publishers</i> can set embargo periods on articles deposited in <i>Open Access Repositories</i>.

Fig 22. The *Commercial Publishers* sub-category.

3.2.2.2 Sub-category: Accessibility

The main benefit of *Open Access* that is echoed throughout the data is that it solves the subscription problem, often named the *Serials Crisis* that *Libraries* are the primary victims of. The subscriptions are a problem because of the dual role that *Libraries* inhabit, as they are both the suppliers and consumers of *Scholarly Communication*. In the traditional model for *Scholarly Communication* *Libraries* were dependant on the circumstances that the *Commercial Publishers* dictated. Through the advent of *Open Access*, this has changed.

The benefits of digital content that is freely accessible in *Open Access Repositories* and *Open Access Journals* is that they, as seen in the *Benefits of Open Access* category, have an increased *Accessibility* and *Visibility*, resulting in the content being downloaded and cited more. An enhanced impact is made possible by combining digital content with the web and the principles of *Open Access*. This is a key argument for *Open Access*;

Scholarly Communication should be made available in *Open Access* because of the tendencies of increased *Accessibility* and *Visibility* that leads to a faster advancement of scientific knowledge and commerce. Also, as *Scholarly Communication* is often funded by public means, it should therefore be available to the public. *Open Access* reduces global cost of scientific publication when compared to the subscription model through its enhanced *Accessibility*. It also eases the financial restraints of low funding research.

Accessibility is tied to the accumulative value of knowledge, which rest on the idea that to create new knowledge, past knowledge is needed. *Authors as Researchers* can acquire access to new knowledge faster, and can then build upon this knowledge in a faster pace and can also avoid duplication of efforts. This is contrasted with the competitive value of information and knowledge that are the main focus of *Commercial Publishers*. The *Authors'* motivation for dissemination and the motivations for *Commercial Publisher* clashes here, as *Authors* desire to influence further development of research and knowledge. *Open Access* offers an alternative that that focuses on the accumulative value of *Scholarly Communication*.

Sub-category: Accessibility
<p>Description This sub-category represents the theoretical sorting of concepts that describe the relationship between the <i>Accessibility</i> of <i>Scholarly Communication</i> and other categories.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • <i>Open Access</i> solves the <i>Serials Crisis</i> for <i>Libraries</i> that affects them through the dual role that <i>Libraries</i> inhabit as both the suppliers and consumers of <i>Scholarly Communication</i> through the <i>Increased Accessibility</i> without subscription fees. • <i>Accessibility</i> of content being impacted by the <i>Open Access</i> benefit of <i>Increased Accessibility</i> and <i>Visibility</i> results in the content being downloaded and cited more. • The increase of <i>Accessibility</i> is a key argument for <i>Open Access</i> as a model for <i>Scholarly Communication</i> as it leads to a reduced global cost of dissemination.. • <i>Accessibility</i> is tied to the accumulative value of knowledge that allows <i>Authors as Researchers</i> to build on previous knowledge without duplication of efforts. This is contrary to how the dissemination of content is handled by <i>Commercial Publishers</i>, that stops access for profit. • <i>Authors as Researchers'</i> need for a quick dissemination and the motivations for <i>Commercial Publisher</i> are in conflict, where <i>Open Access</i> offers an alternative.

Fig 23. The *Accessibility* sub-category.

3.2.2.3 Sub-category: Visibility

The enhanced *Visibility*, that both *Authors* and editors has seen from content being made *Open Access*, has been reported to offer *Authors as Content Providers* citation-advantages, through the increased likelihood of *Open Access* content showing up in

search results. Although this citation-advantage has been disputed since it was first reported, later research has shown that articles do seem to be cited more often if published as *Open Access* and most previous studies are discussed in the excerpts to affect the citation rate advantageously.

One key point is that it seems that the citation advantages of *Open Access* are mainly found if articles are published in lower ranked journals, which seem to indicate that at least articles in themselves have a citation advantage if they are *Open Access*. This may be because of that higher ranked journals might not be available as *Open Access*. This is in conflict with the existing theory that higher citation rates of *Open Access* articles are due to that authors post their best articles online (Xia & Nakanishi 2012).

Factors that are reported to be significant regarding the higher citation advantages are the early views that articles are receiving from being in pre-print and the so called self-selection bias, which is the idea that *Open Access* papers are most likely to be posted by *Authors* if they have already reached promotion or tenure. As it is their best content that is made available online in *Open Access*, there is a higher probability that these sources gain higher citations research outcomes. Here, it is argued, that it's not the contents *Open Access* status that are the significant attribute for citation, rather it is the reputation of the *Author* (Xia & Nakanishi 2012). This can be related to the sub-category *Readership* in the *Authors* category.

There are disagreement regarding this. It has been widely recognised that the *Visibility* of publications plays an important role in the use and citation of publications. Evidence has been made for positive correlation between the *Open Access* status of content and their citation rates in general. Specifically, after becoming *Open Access*, it is the papers in low quality journals that tend to receive more citations in comparison to their non-*Open Access* counterparts in the same journals. Significant relationships between content being *Open Access* versus non-*Open Access* and the contents citation rate have shown themselves in both high-ranked and low-ranked journals (Xia & Nakanishi 2012).

Sub-category: Visibility
<p>Description This sub-category represents the theoretical sorting of concepts that describe the relationship between the <i>Visibility</i> of <i>Scholarly Communication</i> other categories.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • <i>Scholarly Communication's Visibility</i> is increased by <i>Open Access</i>, which grants <i>Authors</i> citation-advantages as content being made <i>Open Access</i> are more likely to show up in search results.

Fig 24. The *Visibility* sub-category.

3.2.2.3.1 Sub-category: Preservation

As stated above in the *Open Access* core-category, in the Berlin declaration of *Open Access*, the long term *Preservation*, or at least archiving of *Open Access* content, was a central idea. It is important that *Libraries and Librarians*, and other institutions engaged in *Open Access* processes realise that *Preservation* besides its assumed benefits also posits a huge cost as it is a process and not a one-time activity. The costs of digital preservation might pose a problem in the future as many *Institutional Repositories* today lack long-term preservation plans. This is unsustainable regarded both economically and socially (Chowdhury 2014a; Chowdhury 2014b). Collaboration is here encouraged, as the cost could be reduced if the preservation process were controlled centrally.

Regarding *Open Access* preservation, there are initiatives to tackle this. The *Directory of Open Access Journals* (DOAJ) has declared a commitment to the long-term preservation of scholarly publication, which rests on a co-operation between Lund University and the National Library of the Netherlands. Their mission is to ensure permanent access to scientific output for the future. It is also stated in the data that that they are struggling with a Sisyphian stone, being the continuous growth of the *Open Access Manifestations*, as there are more open access titles being added than are being archived in DOAJ. From a *Preservation* point of view there is a lot more of digital content being produced and disseminated than there are print material due to the fact that the practical bars to publishing has been lowered (as described by Seadle 2011).

Preservation of digital content is not the same as preserving print collections. New formats, business models and ways of dissemination are being developed, providing challenges to long-term preservation. This makes digital Preservation an activity that is constantly in need to adapt to technological progress and innovation. There are many new and emerging formats that need to be audited and planned for to be included for access in the future, even for content that is not yet available. *Libraries* have an arsenal of tools, services and best practices that can guarantee the preservation of digital content today, such as the Digital Asset Framework. As new formats for digital content is constantly being introduced, *Open Access Repositories* are required to develop preservation plans accordingly, that anticipates these new formats, or the *Preservation* of the deposited content with its promises to of benefits it delivers to *Scholarly Communication* in general, and the contributing *Authors* in particular, will fail (Hitchcock 2011).

The digital *Preservation* of content disseminated in journals managed by smaller *Open Access* publishers are at risk as these publishers often lack the funding needed to plan for archiving. If these non-commercial publishers go out of business before their content is archived, this content could be lost forever. *Libraries* should therefore prioritise these small publishers and aid them in their archiving endeavours. This is also true for content that is only archived in the homepage of the *Authors*. There is need to identify this form of content and archive them properly in an *Open Access Repository*.

Sub-category: Preservation
<p>Description This sub-category represents the theoretical sorting of concepts that describe the relationship between the <i>Preservation of Scholarly Communication</i> and other categories.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • Long term <i>Preservation of Open Access</i> content is a central idea to the <i>Open Access</i> movement. • <i>Libraries and Librarians</i> need to acknowledge that <i>Preservation</i> is a process. • <i>Institutional Repositories</i> today lack long-term <i>Preservation</i> plans. • <i>Open Access Repositories</i> are required to develop <i>Preservation</i> plan to handle the increasing amount of data created to be able to provide service to <i>Scholarly Communication</i> in general and to <i>Authors as Content Providers</i> in particular. • <i>Preservation of Scholarly Communication</i> disseminated in <i>Open Access Journals</i> managed by smaller publishers is lacking. • <i>Open Access Repositories</i> needs offer <i>Preservation of Authors'</i> self-published material.

Fig 25. The *Preservation* sub-category.

3.2.3 Category: Developing and transitional countries

This category describes the special circumstances to the ideas and *manifestations* of the *Open Access* core-category, because of the realities that the developing world are facing. While the *Benefits* and *Barriers* of *Open Access* remains as they are described in the *Open Access* core-category, the realities does put *Developing and Transitional Countries* in a situation that are not the same for how *Open Access* is researched and discussed in the developed world. The meaning of *Open Access* changes under these circumstances. These realities are explored below in the property *Promises versus Realities*.

Category: Developing and transitional countries
<p>Description This category is the theoretical sorting of concepts regarding the stance that <i>Authors</i> take regarding <i>Open Access</i> and the issues that <i>Authors</i> may perceive and what influences them in their interaction with the movements <i>manifestations</i>.</p>

Fig 26. The *Developing and Transitional Countries* category.

3.2.3.1 Sub-category: Promises versus realities

Open Access in *Developing and Transitional Countries* is in the data suggested to have unique characteristics in comparison with the developed countries in which that *Open*

Access is being researched normally. *Developing and Transitional Countries* does especially benefit from the growth and development of *Open Access*, where the *Benefits* sub-category in the *Open Access* core-category helps to circumvent both *accessibility* issues of *Scholarly Communication* as well as the financial constraint that subscription imposes. It is also true that *Open Access* for *Developing and Transitional Countries* can prove to be the long-term answer to *Accessibility* of much needed scientific literature. *Open Access* is as a way to empower the populations of *Developing and Transitional Countries* through dissemination of information and knowledge.

While the promises inherent in the *Open Access* mission gives hope of bridging diverse scholarly communities through technology, *Developing and Transitional Countries* also have to deal with the reality that determines the probabilities for the success of *Open Access* in their countries. There is a risk for major part of underprivileged countries to be deprived of important *Scholarly Communication* and this can result in a wider gap between information have and have-not nations. The publication policies of larger developing countries like China and India are suggested to promote *Open Access* for *Scholarly Communication* for wider audiences and for collaboration that results in knowledge sharing and learning between countries. Without access to high quality information and resources *Developing and Transitional Countries* should be considered to be at a severe disadvantage in terms of sustainable socio-economic, political and cultural development.

In developed countries, much of the dissemination of scholarly content are already digital and are reaching towards *Open Access*. Regarding this, *Libraries in Developing and Transitional Countries* are hoped to be able to play a key role in increasing *Accessibility* to vital *Scholarly Communication* through *Skills* development regarding interaction with digital technologies, but this is not possible unless certain requirements are met. Funding is needed, and in the data *Developing and Transitional Countries* often turn to their governments for funding and infrastructure development needed for *Open Access*. The physical realities of *Open Access* are often forgotten in the literature of *Open Access* that focuses on the situation in developed countries. In a contrasting excerpt relating to Nigerian *Open Access*, the physicality is more prominent. Both the infrastructure of electrical power supply needed to truly make an *Institutional Repositories* accessible 24 hours a day is discussed. If electrical power supply is unavailable, information and communication technology systems are made unworkable. Internet connection is another vital infrastructure aspect for *Open Access* that is not growing fast enough in Nigeria. Low cost communications are needed to reach the socio-economic development hoped for (Uzuegbu & McAlbert 2012).

Where developed countries have already acknowledged the *benefits* of *Open Access*, the data reports of low awareness in *Developing and Transitional Countries* regarding how to properly manage digital resources in general as well *Open Access* technology. It also reported that it is usual for *Authors as Researchers* in *Developing and Transitional Countries* to be unaware of *Open Access* or lack knowledge of the existence of *Open Access Journals*, and that they do not see the use of, or be aware of the need for, the modernisation of *Libraries* and *Skills* development of *Librarians*. Again, the hopes are

turned to *Libraries and Librarians* in that *Librarians* should handle this *unawareness* through *Advocacy* and get universities and *Authors* on board with the *Open Access* initiatives. There are also issues regarding *Financial Barriers*, where the reduction of cost associated to subscriptions are deemed more important to *Developing and Transitional Countries* than for developed countries. There is also a lack of knowledge about how to acquire proper licensing of scholarly journals, as well as poor technological infrastructure including connectivity, plus inadequate *Skills* development for the management of information and communications technology. This skill development is suggested to be very important for the development of an *Open Access* environment in *Developing and Transitional Countries*. Another issue that is not discussed in other contexts than *Developing and Transitional Countries* are the physical space needed to establish *Open Access Manifestations*. In one excerpt, bandwidth is colourfully lifted as the “life-blood of the world’s knowledge economy” (Uzuegbu & McAlbert 2012).

In *Developing and Transitional Countries* the *Benefits* of the *Open Access* core-category are recognised in *Institutional Repositories*, which provide increased *Visibility* of locally created scholarly content. This can, as suggested in the *Open Access Repositories* property, function for promotion of the hosting university that could increase the hosting institutions prestige, while at the same time benefit the *Authors as Content Providers* through efficient dissemination of their research. The increase of impact of the content that the *Authors* provide is assumed to assist in the global reach of the countries’ *Scholarly Communication*, which connects the *Scholarly Communication* in the developing world with that of the developed. Although, one could look at the *Scholarly Communication* in Africa as an example where journals aren’t indexed or abstracted internationally, and theses and dissertations are in Africa buried and forgotten in unconnected libraries. One of the greatest challenges to African research content is that the content that does get published internationally, are published in expensive subscription only journals managed by *Commercial Publishers*, which disallows use of the content for those that cannot afford them. *Usability* is an obvious issue for African *Scholarly Communication*, they are instead, because of undeveloped infrastructure and *Legal* and *Financial Barriers*, tucked away, inaccessible, in remote corners of research institutions, or in an unconnected *Library*.

The *Technical Barriers* found in the *Developing and Transitional Countries* category takes a different form than the one found in the *Open Access* core-category. Here the key to success of *Open Access* is identified to be the education and skills developments of *Librarians* and other information workers necessary to sustain *Open Access Repositories*. Properly trained and educated *Librarians* can act as a bridge between digital knowledge and students, faculty and researchers, and *Advocate* for the free and *Open Access* to digital knowledge to stakeholders responsible for policies and mandates. This is a big responsibility, as it determines whether the developing countries will be left behind in the technological progress or not (Segbert-Elbert 2010).

Sub-category: Promises versus realities

Description

The theoretical sorting of the concepts represented in this sub-category represents the description of the particular situation that *Developing and Transitional Countries* are facing in their work towards *Open Access of Scholarly Communication*.

Summary of relational statements:

- *Developing and Transitional Countries* provides unique circumstances regarding the implementation of the ideas of *Open Access*
- *Developing and Transitional Countries* gain more from the *Benefits of Open Access*.
- *Open Access* can be the long-term solution to *accessibility of Scholarly Communication for Developing and Transitional Countries*.
- *Open Access* can empower the populations of *Developing and Transitional Countries* through the dissemination of information and knowledge.
- Without *Accessibility to Scholarly Communication* the *Developing and Transitional Countries* are at risk of lagging behind in research and development.
- *Libraries in Developing and Transitional Countries* can play an important role in increasing *Accessibility to vital Scholarly Communication* through *Open Access* ideas and *Skills* development regarding interaction with digital technologies.
- *Technical and Legal barriers in Developing and Transitional Countries* are shown in a lack of knowledge in *Libraries and Librarians* regarding management of *Open Access manifestations* and about proper licensing.
- The *Technical Barriers* to *Open Access* are complicated by poor technological infrastructure and a lack of *skills* regarding the use of information and communications technology.
- There is a low *Awareness of Open Access manifestations in Developing and Transitional Countries*, this impacts the modernisation of *Libraries* and the possibility for *Skills* development among *Librarians*.
- *Librarians' Open Access Advocacy* can be a solution to the issues of *Awareness in Developing and Transitional Countries*.
- The *Skill* development of *Librarians* is important for the development of an *Open Access* environment in *Developing and Transitional Countries* as a way to overcome *Technical Barriers*.
- The *Increased Visibility of Scholarly Communication made Open Access* are viewed highly in *Developing and Transitional Countries* as the possibility of the dissemination of locally created content can promote that content globally for the prestige of the hosting institution. This connects the *Scholarly Communication* in the developing world with that of the developed.
- The lack of *Visibility of scholarly content in Developing and Transitional Countries* in the current *Scholarly Communication* is deemed a great challenge that needs to be handled by *Open Access*.

- *Developing and Transitional Countries* might not afford the *Scholarly Communication* that are disseminated by *Commercial Publishers*.
- The *Usability* of *Scholarly Communication* is an issue in *Developing and Transitional Countries* because of a lack of *Availability* due to *Technical* and *Legal barriers*.

Fig 27. The *Promises versus realities* sub-category.

3.2.4 Category: Libraries and librarians

The purpose of *Open Access* to *Libraries and Librarians* is to remove subscriptions, solve issues regarding pricing and permission, and replace traditional *Scholarly Communication* with that of a culture of sharing and collaboration, thus providing a catharsis of their current situation. In this utopian new situation the costs of providing *Open Access manifestations* are absorbed by the funding institutions, which give libraries a lot more wiggle room regarding their currently starved budgets. While this view is pervasive in the excerpts, it is also recognised as an ideal situation. *Librarians* of the future will hopefully be active *Advocates* in the turn towards *Open Access* in *Scholarly Communications*, which affects changes toward easier access to information.

As have been suggested above, *Libraries and Librarians* and their needs are not considered to be the main objective of the progress of the *Open Access* movement. Still, *Libraries and Librarians* have in their role as key actors in *Scholarly Communication* assumed a central position in the progression towards an open and *increased accessibility* of scholarly content. *Librarians* are increasingly claiming *leadership* in the movement as the importance of *Advocacy* and informed action are recognised as tools to make *Authors comply* with the *manifestations* of *Open Access* through *Self-archivation* and publishing in *Open Access Journals*. They are also assuming roles as educators of *Open Access*, managers of *Open Access Repositories* and publishers of *Open Access Journals*.

Libraries are discussed in many ways in the data, but it is in their role as academic libraries that *Libraries* are mostly featured. Here they become the naves of *advocacy* for, or *publishers* of, *Open Access*. Their unique perspectives due to the amount of experience of and work they do in *Scholarly Communication* already can be valuable to the *Open Access* movement.

As the fundamental values of the *Librarian* profession resonates with the principles of *Open Access* through its focus on increasing *accessibility* of content to as wide audience as possible, this puts them in a position where they are almost required to act upon the potential that *Open Access* provide. This potential is of course tied to the mission of *Open Access*, namely to increase *Accessibility* of *Scholarly Communication*. This is argued to definitely benefit the *Libraries'* patrons, be they *Authors as Researchers* or the general public, and provides benefits both socially and economically to the society as a whole. Here *Librarians*, especially in an academic setting, have *Scholarly*

Communication as a natural part of their profession, and is needed to act proactively so that *Open Access* can be realised. The progress of *Open Access* to all scholarly content is an ongoing project that needs *Libraries and Librarians* to engage in *Advocacy*. For libraries, *Open Access* can function to retake *Libraries'* position as central to and facilitator of *Scholarly Communication*. This could be achieved for example through increased collaboration, both between *Libraries* and the reawakened *university presses*, through shared goals and missions (see for example Adema & Schmidt 2010; Hayes & Holley 2014).

Libraries' activities are also related to the *Preservation of Scholarly Communication* that is made *Open Access*. *Preservation* is an important sub-category of *Scholarly Communication* and an important aspect of the *Open Access Repositories* property. *Preservation* is hindered in the traditional *Scholarly Communication* environment because of established licensing agreements that are reinforced by *Commercial Publishers*. This is in the data termed as the permission crisis, in which *Libraries* are now required to pay more while they are getting less from the *Commercial Publishers* that owns the scholarly content (see for example Jones 2013; Rizor & Holley 2014). If *Libraries* could reduce or get rid of these kinds of *barriers*, *Libraries* would be able to, in their *Preservation* endeavours, convert materials to new media formats to keep them readable accordingly to how technology progresses. A benefit for *Libraries* that are establishing themselves in an *Open Access* environment is that they gain the right to archive *Open Access* content. According to the excerpts this regards, of course, when *Authors* comply with the *Self-archiving* of content in an *Open Access Repository*. This can be contrasted with how *Libraries* in traditional *Scholarly Communication*, dominated by *Commercial Publishers*, are required to invest a large part of their budgets to be able to retain the subscription of the scholarly journals that are needed to meet the expectations and needs of their patrons. Here *Authors* are the readers of the same content that they have made available as *Content Providers*, and that *Libraries* make available to them through subscriptions.

So, if *Libraries* wishes to be active proponents of free and open *Scholarly Communication*, they should actively secure freedom from the *Legal Barriers* imposed by *Commercial Publishers*, and work towards *Open Access*. This would allow them to operate in a fully *Open Access* environment, where they can make content available to any user, which could access this content from anywhere. This *Availability*, made possible by *Libraries* through *Open Access*, increases for the benefit of *Authors as Researchers* as well as the interested public who will not be limited by neither *Technical* nor *Financial Barriers*. Through this *Libraries* do not have to negotiate for prices or licensing terms and they do not need not cancel subscriptions due to reduced budgets.

Category: Libraries and librarians		
Description This category represents the theoretical sorting of concepts that are regarding the purpose, goals and hope of <i>Open Access</i> in a library setting, and the <i>Libraries and Librarians</i> interactions and use of the ideas and <i>manifestations</i> found in the <i>Open Access</i> core-category.		
Sub-categories		
Libraries	Librarians	Libraries and librarians and the manifestations of open access
Description This sub-category represents the theoretical sorting of concepts regarding how the <i>Libraries</i> as an entity interacts with the ideas and <i>manifestations</i> of <i>Open Access</i> .	Description The sub-category <i>Librarians</i> are the concepts theoretically sorted to represent the informed and capable actors and proponent of <i>Open Access</i> that work within <i>Libraries</i> .	Description This sub-category is the theoretical sorting of concepts that regard how <i>Libraries and Librarians</i> interact directly with the <i>manifestations</i> of <i>Open Access</i> ideas.
Summary of relational statements:		
<ul style="list-style-type: none"> • <i>Open Access</i> for <i>Libraries and Librarians</i> is a way to solve pricing and permission issues through the <i>increase</i> of <i>Accessibility</i> and <i>Usability</i> of <i>Scholarly Communication</i>. • <i>Libraries</i> gain financial relief through the implementation of <i>Open Access manifestations</i> as the subscription costs imposed by <i>Commercial Publishers</i> can be circumvented. • <i>Librarians</i> are <i>advocates</i> that drives <i>Open Access</i> in <i>Scholarly Communications</i> forward. • <i>Libraries</i> are central to the <i>Scholarly Communication</i> landscape and have taken a forward position to drive the progression of <i>Open Access</i>. • <i>Librarians</i> are taking leadership in the <i>Open Access</i> movement through their important work of <i>Advocacy</i> for <i>Open Access</i> ideas that raises <i>Authors' awareness</i> and <i>compliance</i> with <i>Self-archivation</i> and publishing in <i>Open Access Journals</i>. • <i>Librarians</i> are teaching <i>Open Access</i> ideas. • <i>Librarians</i> are managing <i>Open Access manifestations</i>. • <i>Libraries</i> are central institutions driving the <i>advocacy</i> for <i>Open Access</i> and are disseminating <i>Scholarly Communication</i> through the <i>Manifestations of Open Access</i>. • <i>Libraries</i> are valuable to the <i>Open Access</i> movement due to their unique perspectives on and experience of working with <i>Scholarly Communication</i>. • The fundamental values of the <i>Librarian</i> profession resonates with the ideas of <i>Open Access</i> through the <i>Increased Accessibility</i> of <i>Scholarly Communication</i> that the implementation of these ideas give. • <i>Scholarly Communication</i> is a natural part of the <i>Librarian</i> profession. • <i>Open Access</i> to all <i>Scholarly Communication</i> is an ongoing project that needs <i>Libraries and Librarians</i> to engage in <i>Advocacy</i>. • <i>Libraries</i> can re-establish their position as central to and facilitator of <i>Scholarly Communication</i> 		

<p>through <i>Open Access</i> through collaborations.</p> <ul style="list-style-type: none"> • <i>Libraries</i> engages in the <i>Preservation of Scholarly Communication</i> through <i>Open Access Repositories</i>. • <i>Libraries'</i> activities with <i>Preservation</i> is hindered by the <i>Legal Barriers</i> being upheld by <i>Commercial Publishers</i>. • Through the implementation of <i>Open Access manifestations</i> <i>Libraries</i> can ignore the <i>Legal Barriers</i> set up by <i>Commercial Publishers</i> and engage unhindered with the <i>Preservation of Scholarly Communication</i>.
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Fig 28. The *Libraries and Librarians* category.

3.2.4.1 Sub-category: Librarians

Librarians are aware of the importance and potential of *Open Access*, in which *Open Access* to information sources is the free *Availability of Scholarly Communication* through online dissemination which, through open licensing permits the users to read, download, copy, distribute, print and search and link content as data to software and other use of lawful purpose without financial, legal, or technical barriers or other than those inseparable from gaining access to the internet itself, resonating with the Budapest *Open Access Initiative* definition of *Open Access*.

Sub-category: Librarians		
Description The sub-category <i>Librarians</i> are the concepts theoretically sorted to represent the informed and capable actors and proponent of <i>Open Access</i> that work within <i>Libraries</i> .		
Properties		
Roles in open access	Skills	Open access advocacy
Description The property represents the theoretical sorting of concepts that regards how different roles of <i>Librarians</i> interact with <i>Open Access</i> .	Description The property represents the theoretical sorting of concepts that regards the <i>skills</i> that are wanted or required for effective interaction with <i>Open Access</i> .	Description The property represents the theoretical sorting of concepts that regards the how <i>Librarians</i> engage in <i>Advocacy</i> for <i>Open Access</i> .
Summary of relation statements:		
<ul style="list-style-type: none"> • <i>Librarians</i> recognises <i>Open Access</i> as an increased <i>Availability of Scholarly Communication</i>. 		

Fig 29. The *Librarians* sub-category.

3.2.4.1.1 Property: Roles in open access

Librarians have many roles within a *Library*, and these roles differ to some extent regarding in their interactions with the ideas and *manifestations* of *Open Access*. In the

role as *Digital Librarians*, *Librarians* are required to collect *Open Access* content through the development of gold or green *Open Access manifestations*. They protect intellectual property in a networked environment and ensure information security. They also act as mediators between actors in copyright issues regarding *Open Access* Content. The skills required by a *Digital Librarian* is related to information and communications technology, vital to *Open Access*, and consist of the selection, acquisition, preservation, organisation of digital content relevant for *Scholarly Communication*. One of their roles are that they should serve as *advocates* for *Open Access* promotion which will result in an increased *Awareness* among *Authors* regarding the ideology of *Open Access* that would help the progress of the movement. *Digital Librarians* set up the standards and policies for the information and communication technology and the digital library, and guides the users through copyright legislations. There is a need for specialised competencies for navigation of *Scholarly Communication* for the benefit of *Libraries* and their parent institutions. If these competencies are acquired, it would strongly establish the role of *Librarians* within *Scholarly Communication* (see for example Kamraninia & Abrizah 2010; Uzuegbu & McAlbert 2012).

Librarians can assume the role of *Leaders* in the *Open Access* movement, of which future they are considered both valuable and important. *Leadership* can be assumed due to that *Librarians* attitudes, skills, knowledge and experiences are highly regarded by *Authors* and could therefore also affect the *compliance* and *non-compliance* of their *Open Access Behaviour*. *Librarians* can take leadership in *Open Access* by creating *Open Access Journals*, through which they make change seem possible. This is something that is discussed below in the *Library as Publisher* category.

Academic Librarians have *Scholarly Communication* as a natural part of their profession, but it is important to note that this does not lead to *Open Access*. This is relevant as the work of an *Academic Librarian* is particularly impacted by the issues of *Open Access*. To establish awareness and change, academic librarians need to collaborate with both faculty and administration. *Academic Librarians* are the main group of professionals that assumes the role of *repository* managers.

The role of the *Liaison Librarians* are in the context of *Open Access* to create *Awareness* of the ideology, ideas, and *manifestations* of the movement through *Advocacy* among *Authors* belonging to the institutions under their responsibility. To be able to do this *Liaison Librarians* need to be knowledgeable about *Open Access*. What knowledgeable means in the context of *Open Access* is that *Librarians* need to know what *Open Access* means, that there is a difference between free and open access, what an *Open Access Repository* is, how the creative commons licensing works, about different types of publications and what they mean in the publication process such as e-prints, post-prints, and so on; about the process of *Self-archivation*; search habits of users when they search for *Open Access* content; and finally how *Open Access Repositories* affects *Library* collections. Subject based *Liaison Librarians* could establish the long-term commitments of editors of *Open Access Journals* (see for example Robertson & Simser 2013; Sen 2012; Wiegand 2013).

Property: Roles in open access
<p>Description The property represents the theoretical sorting of concepts that regards the how different roles of <i>Librarians</i> interact with <i>Open Access</i>.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • <i>Librarians</i> in their role as <i>Digital Librarians</i> collect <i>Open Access</i> content through <i>Open Access</i> manifestations. • <i>Librarians</i> in their role as <i>Digital Librarians</i> help <i>Authors</i> navigate the <i>Legal Barriers</i> regarding deposition and publishing of their <i>Scholarly Communication</i> in <i>Open Access</i> manifestations. • <i>Digital Librarian</i> is related to information and communications technology, vital to <i>Open Access</i>, and consist of the selection, acquisition, preservation, organisation of digital content relevant for <i>Scholarly Communication</i>. • <i>Digital Librarians</i> can serve as <i>advocates</i> for <i>Open Access</i> ideas which will result in an increased <i>Awareness</i> among <i>Authors</i> regarding the ideology and <i>manifestations</i> of <i>Open Access</i> that would help the progress of the movement. • <i>Digital Librarians</i> may obtain <i>skills</i> for navigation of <i>Scholarly Communication</i> for the benefit of <i>Libraries</i> and their parent institutions. • <i>Librarians</i> can assume the role of <i>Leaders</i> in the <i>Open Access</i> movement. <i>Leadership</i> can be assumed due to that <i>Librarians'</i> attitudes, skills, knowledge and experiences are highly regarded by <i>Authors</i> and could therefore also affect the <i>Compliance</i> dimension of their <i>Open Access Behaviour</i>. • <i>Librarians</i> can assume <i>leadership</i> by developing and managing <i>Open Access</i> manifestations as a way to offer alternatives to <i>Authors</i>. • <i>Scholarly Communication</i> is a natural part of <i>Academic Librarians'</i> workflows as they are particularly impacted by <i>Open Access</i>. <i>Academic Librarians</i> are the main group of professionals that assumes the role of <i>Open Access Repository</i> managers. • <i>Liaison Librarians</i> can raise the <i>Awareness</i> of <i>Open Access</i> ideas, <i>benefits</i>, <i>barriers</i>, and <i>manifestations</i> through <i>Advocacy</i> directed towards <i>Authors</i>. • <i>Liaison Librarians</i> need to be knowledgeable of <i>Open Access</i> and its <i>manifestations</i> and how <i>Authors</i> can interact with the <i>manifestations</i> through <i>Self-archivation</i> • <i>Liaison Librarians</i> need to know the impact of <i>Open Access Repositories</i> on <i>Library</i> collections.

Fig 30. The Roles in Open Access property.

3.2.4.1.2 Property: Skills

The *Skills* property of the *Librarians* category is tied to the *Open Access Repositories* and *Open Access Journals* categories and the core-category *Open Access* in general.

The core skills that *Librarians* as a group need to have regarding *Open Access* are competencies that make *Librarians* able to help *Authors* make their work *Open Access*. This includes an understanding of the variety of publishing models available, and to be able to evaluate available *Open Access* resources. *Librarians* also needs to have a grasp on how the deposition of works in *repositories* are performed and they should be able to support *Authors as Content Providers* when they comply with *Self-archivation* and publication in *Open Access Journals* and with the publishing agreements that they have signed. This is done through their understanding of how to navigate complex copyright issues and through technical know-how. Furthermore *Librarians* need to be knowledgeable regarding copyright so that users can be guided with confidences to material that can be used according to copyright law. Digital literacy skills are vital for sustainability of digital libraries and *Open Access* initiatives as they ensures the continuous access to content and the effective use of digital resources. (see for example Thomas 2013; Zainab 2010; Zhao 2014). For *Libraries and Librarians, Open Access* should mean to remove permission barriers, which could be accomplished through the adoption of creative commons licensing (as suggested by Zainab 2010).

Librarians should be able to establish outreach and educational activities for the furthering of the *manifestations* of *Open Access* (as seen in for example Stanton & Liew, 2011; Thomas 2013). This task is actualised through the *Librarians' Advocacy*. To be able to engage in *Advocacy*, which is discussed more thoroughly in the property below, *Librarians* are required to be educated and aware of *Open Access* in general as well as about *Open Access* titles suitable for cataloguing. They also need to be able to properly support their patron's research, through guiding them towards suitable *Open Access* sources as it might be difficult for *Authors* to determine the credibility of *Open Access Journals*, in which the risk of predatory *Commercial Publishers* should not be forgotten. It is also important that these predatory publications are not catalogued in the *Library* OPAC or other discovery tools (Lehman 2014).

The collaboration between *Librarians* and *Authors* in relation to *Open Access Repositories* are deemed highly important by the data. In this collaboration *Librarians* need to respond to the *Authors'* needs through offering incentives to participate through the progression of the *Authors'* careers. *Librarians* should also develop the digital services so that *Authors* experience an ease of use through the integration of services through effective meditation (as suggested by for example Steele 2014). *Librarians* also need to be able to set up required software, design journals and handle administration. This *Skill* thus demands a higher technical capability than has previously been expected of *Librarians*. *Librarians* should also be able to educate *Authors as Researchers* about *Self-archivation*. *Librarians* should be able to inform about the types of institutional materials that can be archived and the degree of *Accessibility* and *Usability* that is being given to the users of the *Institutional Repositories* (see for example Kamraninia & Abrizah 2010; Steele 2014; Uzuegbu & McAlbert 2012).

Property: Skills
<p>Description The property represents the theoretical sorting of concepts that regards the <i>skills</i> that are wanted or</p>

required for effective interaction with *Open Access*.

Summary of relational statements:

- The *Skills* of *Librarians* are tied to the *manifestations Open Access Repositories* and *Open Access Journals*.
- *Skills* are the competencies that make *Librarians* able to assist *Authors* in their interactions with *Open Access*.
- *Librarians* need to understand the work processes attributed to *Authors as Content Providers* in their *Self-archivation* in *Open Access Repositories* and publication in *Open Access Journals*.
- *Librarians* need to be able to combat *Technical* and *Legal Barriers* to *Open Access*
- *Librarians* needs to acquire *skills* to perform adequate *Advocacy* directed towards *Authors*.
- *Librarians* need to be able to guide *Authors as Researchers* towards the quality *Open Access* resources found in the *manifestations*.
- *Librarians* need to be knowledgeable about the risks of predatory *Commercial Publishers*.
- *Librarians* can collaborate with *Authors* in the *Authors'* interactions with *Open Access Repositories*.
- *Libraries* needs to offer incentives to *Authors* that correspond to the progression of the *Authors'* careers.
- *Librarians* need to acquire the *Skills* to manage *Institutional Repositories* properly so that *Technical Barriers* can be overcome.
- *Librarians* need to be able to inform and educate *Authors* about *Institutional Repositories* regarding the *benefits* they gain through *Self-archivation* which is seen in an *increase* of *Accessibility* and *Usability* of their contributed content.

Fig 31. The Skills property.

3.2.4.1.3 Property: Open access advocacy

Advocacy are initiatives that are made to raise *Awareness* and *Compliance* among *Authors* and other stakeholders of the potential and *benefits of Open Access* and of the inequity of the high prices of subscriptions that are financially crippling *Libraries*. Free exchange of *Scholarly Communication*, are in this context promoted as for the common good. The data mentions that the perspectives that *Librarians* can bring to the discussion of *Open Access* are often valued by *Authors*, so *Librarians* do have an important role to play in the realisation of *Open Access*, especially regarding their knowledge and understanding of the significance the properties *Accessibility* and *Visibility* have regarding effective *Scholarly Communication*.

There is an expectation that as time passes, more *Authors* will comply with deposition in their own organisations' *Open Access Repositories*, although *Librarians* have seen the

optimism of the potential of *Open Access Repositories* turn into pessimism regarding *Authors as Content Providers* and their cooperation in the *Open Access* movement. This has been shown above in the *Authors' Open Access Behaviour* dimension of *Compliance* and *Non-Compliance*. Here there is a need for *Librarians* to communicate both the values and organisational objectives that are in harmony with the *Open Access* effort, such as the knowledge sharing principles of disseminating content through *Open Access Manifestations*. *Librarians* should also offer attractive and engaging information management services in these repositories, and be able to develop them to be robust and worthwhile contributions to the *Authors* work-flows.

There are several ways in which *Librarians* can communicate the value of *Open Access Repositories* to *Authors*. One example is to promote *Open Access Repositories* as a function to advertise the achievements of the host institution and to enhance the *Authors* reputation through increased *Readership* (suggested by for example Bhardwaj 2014; Eng, Jordan & Leshner 2014; Kamraninia & Abrizah 2010). Another example are regular e-mails that reports on usage and download of deposited content could would allow *Authors* to see the *benefits* with their own eyes (Tsuchide *et al.* 2013). *Open Access Repositories*, should in *Advocacy* be lifted as they can be aligned with the hosting institutions goals, where the achievements of the institution can be showcased for marketing purposes. *Open Access Repositories* can also be used by *Librarians* to create collaborations between *Authors*, mainly through the potentials inherent in *Subject Repository* property. The strengths of *Open Access* could also be promoted through *Librarian* advocates that perform *Awareness* campaigns. Examples of these are to educate stakeholder of the principles and ideas of *Open Access* through providing question and answer sessions. Libraries can also work with outreach programmes as a form of *Advocacy* towards doctoral students, a group found in the *Author as Researchers* role. It has been seen that had doctoral students attended library courses or research consultations were found to have raised *Awareness* and understanding of the benefits of *Institutional Repositories* and the concept of *Open Access* (as suggested by Stanton & Liew 2011). Another peculiar strategy suggested by the data is that *Librarians* should in their *Advocacy* target cognitive, affective and behavioural aspects of *Authors Open Access Behaviour*. The data suggest that if *Librarians* familiarise themselves with the psychology of resistance they could potentially reduce or even prevent it. Knowledge of the psychology of resistance, it is argued, could assist *Librarians* in their work of *Advocacy* through giving them tools suitable to handle, for instance, *Authors* anxiety over new technologies, lack of usability of repositories user interfaces, and, unfamiliarity with needed steps due to infrequency of interaction with technologies, or the psychological resistances to *Open Access* that stem from anxieties resulting from the uncertainties of licensing and copyright in the *Authors* interactions with *Commercial Publishers*. Many strategies are in the data suggested for *Librarians* to succeed in handling the psychological resistance to *Open Access* in the data, and can be read in Quinn (2010). One of these strategies is of course found in the quote that is included in the *Open Access* core-category above.

There is a need for *Advocacy* for *Open Access* for the benefit of *Library and Librarian* in general as the realisation of *Open Access* will remove obstacles and issues faced by

Libraries such as the *Serials Crisis*, and the legal barriers that make up copyright laws and license agreements that hinders the progression of *Open Access*.

Regarding *Open Access Journals*, the data suggest that *Librarians* can advise publishers to adopt this *Open Access manifestation* if institutional support for repositories is unavailable, in which case the *Authors* publication in a journal is made through an article processing cost, usually through the use of research funding, which can be allocated to support publishing.

Culture plays a large part in the *Author as Barrier* property, where especially the publish or perish-paradigm influences *Authors* and their publication habits. This paradigm is something that predatory publishers takes advantage of. Predatory publishers are *Commercial Publishers* that exploit the anxiety and eagerness of *Authors* to publish, as publishing articles is the way forward towards tenure and promotion. Predatory publishers often lack the rigorous review standards that higher quality journals do, and will publish anything as long as the *Authors* are able to pay the fee that has become a large part in the discussion of sustainability in *Open Access Journals*. These unethical and unorthodox practices of publishers are complicating the *Scholarly Communication* environment and should be a major concern for *Libraries and Librarians, Authors Content Providers*, and open access proponents in general. There is a need for *Authors as Content Providers* to develop sufficient skills in relation to publishing, like choosing the best and proper outlets for their works. Here *Libraries and Librarians* can step in and offer education in scholarly publishing literacy.

Property: Open access advocacy
<p>Description The property represents the theoretical sorting of concepts that regards the how <i>Librarians</i> engage in <i>Advocacy for Open Access</i>.</p>

Fig 32. The *Open Access Advocacy* property.

Summary of relational statements:

- *Advocacy* are intended to raise *Awareness* and *Compliance* among *Authors* and through lifting the *benefits of Open Access* and issues that are affecting *Libraries*.
- *Librarians* view on *Open Access* are valued by *Authors* which makes *Librarians* important to the progress of *Open Access*.
- *Advocacy* is recognised as necessary by *Librarians* as *Authors Compliance* have shown to be lacking.
- Through *Advocacy Librarians* need to communicate the values and *benefits* that *Open Access* can give to their parent institutions.
- *Librarians* can lift *Open Access Repositories* as a promotional tool for the *Scholarly Communication* produced by *Authors* in their institutions which can lead to an increased *Readership*.
- *Open Access Repositories* can be aligned with the institutional goals and in *Subject Repository* property.
- Through *Advocacy* the *Awareness* of *Authors* can be raised through campaigns directed towards *Authors*.
- *Advocacy* can directly target the *Authors' Open Access Behaviour* by focusing on psychological resistance to *Open Access*.
- *Advocacy* for *Open Access* by *Librarians* will benefit *Libraries* as the *Compliance* of *Authors* have the potential to counter the *Serials Crisis* through the removal of *Legal* and *Financial Barriers* to *Open Access*.
- *Advocacy* for the *Open Access Journals* is preferable if the establishment of *Institutional Repositories* is impossible due to lack of support.
- *Libraries* and *Librarians* can counter predatory *Commercial Publishers* through the raised *Awareness* of *Authors* that is the result of *Advocacy*, but this relies on *Librarians* having the proper *skills* regarding the knowledge of *Open Access*.

Fig 32 (cont.).

3.2.4.2 Sub-category: Libraries

Libraries are identified in the data as central actors in *Scholarly Communication*, just as *Scholarly Communication* is a central part of particularly academic *Libraries*. The role of *Libraries* in *Open Access* is to increase *Awareness* among *Authors* belonging to the faculty under their responsibility. *Libraries* should therefore strive to create *Awareness* of *Open Access* among *Authors as Researchers* as well as the funding agencies that support them. *Libraries* need to take *Open Access* seriously as the amount of *Availability* and *Accessibility*, or lack thereof, of content will in the future landscape of *Scholarly Communication* have broad implications for educational institutions. Whether the future holds *Open Access* as the primary model of access to *Scholarly*

Communication, or instead retains the older models whose rules are dictated by *Commercial Publishers* and their ownership of copyright that puts up access and financial *Barriers* will have a major impact regarding what *Libraries and Librarians* will be able to do. In the data there is hope for a continuing build-up towards *Open Access*, which is something that is held up as a hope for *Libraries and Librarians* in which they, in a *Scholarly Communication* landscape of abundance, can concentrate on building services and support for the dissemination of content, an activity that plays well with the fundamental values of *Libraries and Librarians* stated above, instead of wasting time and money in procuring it, while at the same time be pressured by a continuously shrinking library budget. Although there is some uncertainty regarding the cost saving mechanisms provided by *Open Access*, *Libraries* are by the data seen as victims of subscription fees in that subscriptions makes *Libraries* unable to comply with their mission to acquire relevant literature needed by their patrons.

Sub-category: Libraries		
Description This sub-category represents the theoretical sorting of concepts regarding how the <i>Libraries</i> as an entity interacts with the ideas and <i>manifestations</i> of <i>Open Access</i> .		
Properties		
Serials crisis	Libraries as publishers	Libraries as collaboration partners
Description This property represent the concepts that lifts the <i>Serials Crisis</i> as a problem to be solved, of which <i>Open Access</i> is a possible solution.	Description These concepts are theoretically sorted into this property as they lift how <i>Libraries</i> are engaging in <i>Open Access</i> publishing.	Description The theoretical sorting for this property represents the concepts that describe potential collaborations that <i>Libraries</i> can engage in regarding <i>Open Access</i> .
Summary of relational statements:		
<ul style="list-style-type: none"> • <i>Libraries</i> are central actors in <i>Scholarly Communication</i>, • <i>Scholarly Communication</i> is central to the work performed in <i>Libraries</i>. • <i>Libraries</i> should strive to raise <i>Awareness</i> of <i>Open Access</i> among <i>Authors as Researcher</i>. • <i>Accessibility</i> will determine the future of <i>Scholarly Communication</i> that will impact <i>Libraries</i> as central actors in which <i>Libraries</i> need <i>Open Access</i> to be the primary model of access. • If <i>Libraries</i> fail to realise <i>Open Access</i> as a primary model for <i>Open Access</i> the control of <i>Scholarly Communication</i> will remain in the hands of <i>Commercial Publishers</i>. • <i>Open Access</i> can if realised lead to <i>Librarians</i> developing attractive services for <i>Authors</i> and relieve them of financial restraints. • <i>Libraries'</i> fundamental values correspond with those of the <i>Open Access</i> ideology regarding <i>Accessibility</i> of research. 		

- *Libraries* are by the data seen as victims of the subscription fees that *Commercial Publishers* impose which makes *Libraries* strive towards *Open Access*.

Fig 33. The *Libraries* sub-category.

3.2.4.2.1 Property: *Serials crisis*

There are many instances in the data that reports that the *Serials Crisis* still looms large in library budgets (see for example Quinn 2010; Rizor & Holley 2014). It is, solemnly stated, that the journal prices are ever increasing, faster than inflation and definitely faster than the library budgets that instead should be used to procure more content for the library patrons. This is something that has been going on for at least three decades, and despite the hopes that have been expressed by *Libraries* regarding the *Open Access* potential of reducing subscription costs, this has not been the case. The budgets are still dominated by the subscription to content that a small number of multinational *Commercial Publishers* uphold. This is much due to the “Big Deals” which were first perceived as a solution to the increased subscription costs, but instead has transformed into a shackle for the *Libraries* affected by them (see for example Cimen 2012; Steele 2014). The work that has been done to change this through *Open Access* have not yet lived up to the expected potential despite the opportunities that technology makes possible for the global *Accessibility* and *Visibility* of *Scholarly Communication* and the assumed persuasive power of increased *Readership* for *Authors* that *Open Access* offer.

The potential cost savings for *Libraries* have been argued extensively in the data. Suggestions of what *Libraries* could do with the savings they can potentially make are that they could further *Open Access* even more by the creations of research funds that would specifically target research that is being made available as *Open Access* (notable concepts were categorised from excerpts found in Chowdhury 2014a; Houghton & Swan 2013; Martin 2010). This scenario has of course certain prerequisites such as the actualisation of *Open Access* and that *Libraries* are successful in reallocating their budgets with the consent of their parent institutions. *Open Access* content, in any case, can for *Libraries* function as inexpensive and immediate additions to their collections, something that is of course highly valued by underfunded organisations and academic *Libraries* in *Developed and Transitional Countries*.

In spite of the threats that the *Serials Crisis* pose to *Libraries*, these threats could also be used as a tool for *Open Access Advocacy*. This is something that is lifted in the *Awareness* property of the *Open Access Manifestation* sub-category. *Authors* and universities are increasingly regarding the *Financial Barriers* and the *Serials Crisis* as a serious obstacle to the efficiency of current *Scholarly Communication*.

Property: <i>Serials crisis</i>
<p>Description This property represent the concepts that lifts the <i>Serials Crisis</i> as a problem to be solved, of which <i>Open Access</i> is a possible solution.</p>

Fig 34. The *Serials Crisis* property.

Summary of relational statements:

- The *Serials Crisis* still impact *Libraries* in their budgets.
- *Libraries* regard *Open Access* as a potential solution to the *Serial Crisis* through the *increase of Accessibility* that is a *benefit of Open Access*.costs, this has not been the case.
- The *Increase of Accessibility* for the *benefit of Libraries* has not happened.
- *Open Access* are not living up to the potential of *increased Accessibility* and *Visibility of Scholarly Communication*, harming the *Advocacy* towards *Authors* that *Librarians* perform from within the *Libraries*.
- If *Libraries* save their money, through implementation of *Open Access* ideas, they could direct their budgets towards the development of the *Manifestations of Open Access*.
- *Open Access* content can for *Libraries* function as inexpensive and immediate additions to their collections, which is a valued function to *Libraries* in *Developed and Transitional Countries*.
- The *Serials Crisis* could also be used to perform *Advocacy* as *Authors* increasingly regard the *Financial Barriers* and the *Serials Crisis* as a serious obstacle to the efficient dissemination of *Scholarly Communication*.

Fig 34 (cont.).

3.2.4.2.2 Property: *Libraries as publishers*

Besides the already established roles that *Libraries* play in *Scholarly Communication* mentioned above, *Libraries* could also function as publishers. *Libraries as Publishers* is nothing new, but in the current *Scholarly Communication* landscape and with the influence of *Open Access* and its potential, this role has further significance.

Libraries are becoming digital publishers that offer *Open Access* publishing in *Open Access Journals* and act as mediators in the depositing of content in *Institutional Repositories* through *Authors Self-archivation*. The managing of *Open Access Journals* is becoming an increasing burden on, as well as a growing need for, *Libraries*. *Libraries* have begun to see publishing as a means by which they may bring more value to themselves and to their host institutions. If this trend continues, one could expect that *Libraries as Publisher* would begin to encroach on the activities that traditionally would be performed by university presses. Here *Libraries* would view their publishing endeavour as another value added services in their role they perform in *Scholarly Communication*, where they can establish themselves in a key role in the view of the hosting institutions that the *Libraries* serve. The *Libraries* can in this role assert their worth to the institutions, as their publishing can enhance the prestige of the institutions themselves in the global scholarly community as we have seen in the *Open Access Manifestations* sub-category. The benefits that *Libraries as Publishers* gain can be extended to include books, which are of course highly relevant for researchers and students in the dissemination of ideas. In book publishing *Libraries as Publishers* can also engage in print-on-demand activities. This would reduce the costs required for

distribution, that are making *Commercial Publishers* to engage less in book publishing. This would also disseminate and sell books on a global scale, which could prove important as the global scholarly book dissemination is decreasing (as suggested by Ferwerda 2010).

Property: Libraries as publishers
<p>Description These concepts are theoretically sorted into this property as they lift how <i>Libraries</i> are engaging in <i>Open Access</i> publishing.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • <i>Libraries</i> could function as <i>publishers</i> of <i>Open Access</i> content in <i>Open Access Journals</i>. • <i>Libraries</i> can facilitate <i>Authors'</i> act of <i>Self-archivation</i>. • <i>Libraries as Publishers</i> managing <i>Open Access Journals</i> is as a growing need for <i>Libraries</i> as they can start to compete with <i>Commercial Publishers</i> and increase their perceived value among <i>Authors</i> and their hosting institutions • <i>Libraries</i> can view their activities in publishing as an additional service to those they already perform in <i>Scholarly Communication</i> making them central to the process of <i>Scholarly Communication</i>.

Fig 35. The *Libraries as Publishers* property.

3.2.4.2.3 Property: *Libraries as a collaboration partners*

Libraries' Open Access collaboration opportunities range from research offices of parent institutions and between the *Libraries* themselves, to *Authors* and university presses. *Libraries* are now acting in a changing research landscape which is increasingly pressuring them to assume a proactive role to take advantages of the *Open Access* potential shown in the increased *Accessibility* and *Visibility* and *Usability* of *Scholarly Communication*.

Libraries could collaborate with each other, faculty and other organisations to build special collections. This opportunity let *Libraries* gain from the digitisation of their rare items, and at the same time they accumulate professional experience in management and development of *Open Access Repositories* that in turn increases *Accessibility* and *Usability*, as the public can read, use and cite the resources, as well as *Visibility* of the collection through the web. In this the collaboration between *Libraries*, as well as with other entities, can make the burden of technical support and maintaining infrastructure easier to carry.

Academic *Libraries* are increasingly assuming the role of *Libraries as Publishers* to establish alternatives to the traditional outlets of scholarly publishing. As this continues, and today there are some that voices the opinion that at digital publishing should even

be a core *Skill* for *Academic Librarians*, there is a case that can be made for establishing collaborations between *Libraries* and university presses (see for example Keener 2014).

Property: Libraries as collaboration partners
<p>Description The theoretical sorting for this property represents the concepts that describe potential collaborations that <i>Libraries</i> can engage in regarding <i>Open Access</i>.</p>
<p>Summary of relational statements:</p> <ul style="list-style-type: none"> • <i>Open Access</i> offers opportunities for collaboration between <i>Libraries</i> and other <i>Libraries</i>. • <i>Open Access</i> offers opportunities for collaboration between <i>Libraries</i> and <i>Authors</i>. • <i>Open Access</i> offers opportunities for collaboration between <i>Libraries</i> and university presses to establish themselves as <i>Libraries as Publishers</i>. • Digital publishing should be a core <i>Skill</i> for <i>Academic Librarians</i>.

Fig 36. The *Libraries as collaboration partners* property.

3.2.4.3 Libraries and librarians and the manifestations of open access

Sub-category: Libraries and librarians and the manifestations of open access	
<p>Description This sub-category is the theoretical sorting of concepts that regard how <i>Libraries and Librarians</i> interact directly with the <i>manifestations</i> of <i>Open Access</i> ideas.</p>	
Properties	
Open access repositories	Open access journals
These concepts are theoretically sorted into this property as they regard how <i>Libraries and Librarians</i> engage with <i>Open Access Repositories</i> .	These concepts are theoretically sorted into this property as they regard how <i>Libraries and Librarians</i> engage with <i>Open Access Journals</i> .

Fig 37. The *Libraries and Librarians and the Manifestations of Open Access* property.

3.2.4.3.1 Property: Open access repositories

Libraries are in the context of *Open Access* taking a leading role in the promotion and management of *Institutional Repositories*, which are especially impacting academic *Libraries*. *Libraries* support the *Authors' Self-archivation* in *Institutional Repositories* and other *Open Access Repositories* through *Advocacy*. While *Institutional Repositories* can function as a cost-reduction mechanism as stated in the *manifestations* sub-category, *Libraries* are encouraged to focus more on the new opportunities that *Open Access Repositories* are offering them. This is that *Open Access Repositories* can enhance the library position as a central part of their institutions work-flows. This is done through the marketing function of *Institutional Repositories* where the showcasing of the *Libraries* parent institutions scholarly output can be set up, in which *Libraries*

assert their worth to the hosting institutions by raising the institutions prestige, which is discussed in several excerpts (examples include Ezema 2013; Wacha & Wisner 2011; Zhao 2014) While *Commercial Publishers* role in *Scholarly Communication* is to maximise profit, *Libraries* role is to disseminate content as widely as possible, which positions them in an advantageous and attractive position in the eyes of their institutions.

Libraries work with *Institutional Repositories* is seen by the data as a natural extension of the work normally performed in them, since the information management, application of metadata, knowledge and understanding of copyright issues and *Open Access* mandates that *Institutional Repositories* depend on have long been a part of especially academic *Libraries*.

Libraries can support the development of *Institutional Repositories* through the creation and management of *Institutional Repositories* and by designing, implementing and enforcing institutional policies and procedures. A key recommendation for *Libraries and Librarians* is to communicate mandatory thesis deposit policies properly through various channels such as supervisors, official research school communications, handbooks, library workshops and other *Advocacy* activities (see for example Gramstadt 2012). They can provide feedback about the work process of repositories and design attractive and effective interfaces as well as identify the *Self-Archiving* activities and processes needed to ease the work required by *Authors*. *Libraries* can offer further assistance to *Authors* through an active support regime on how to deposit and search for content, and also provide necessary metadata to the deposited content.

Librarians role in an *Institutional Repositories* are to participate in the quality assurance process, check metadata and monitor uploads. *Librarians* perform the action required to ensure long-term preservation of deposited content.

Through the promotion of the *Institutional Repositories*, for example by introducing *Institutional Repositories* in user education programmes, *Awareness* can be raised about *Open Access*, which could persuade *Authors* in the *Libraries'* parent institutions to comply with the *Open Access* mission. This would increase understanding of purpose and benefits of *Open Access* and *Institutional Repositories*. While *Institutional Repositories* are viable, robust and powerful dissemination tools of *Open Access* content, *Libraries* need to be clear about the benefits of them in their communication with what they can and cannot do. Otherwise there is a risk of losing the trust of *Authors* they have received in managing their scholarly output, which could affect the progress of *Open Access* in general (as suggested by Quinn 2010).

Property: Open access repositories
<p>Description These concepts are theoretically sorted into this property as they regard how <i>Libraries and Librarians</i> engage with <i>Open Access Repositories</i>.</p>

Fig 38. The *Open Access Repositories* property.

Summary of relational statements:

- *Libraries* are taking a leading role in the *Advocacy* and management of *Institutional Repositories* through supporting *Authors' Self-archiving* in *Open Access Repositories*.
- *Open Access Repositories* can position *Libraries* as a central part of *Authors'* work-flows as they can promote the *Scholarly Communication* deposited in the *repositories*.
- *Commercial Publishers'* role in *Scholarly Communication* is to maximise profit while *Libraries'* role is to disseminate content as widely as possible. The position *Libraries* take are more attractive to *Authors*.
- *Libraries* work with *Institutional Repositories* is as a natural extension of the work performed by particularly academic *Libraries*.
- *Libraries* support *Institutional Repositories* through developing, designing and managing them.
- Through attractive and effective interfaces and other development of the *Self-Archiving* work-flows attributed to *Authors as Content Providers*, *Libraries* can assist *Authors* with the *Authors' Scholarly Communication*.
- Through *Advocacy* of *Institutional Repositories*, *Awareness* can be raised about *Open Access* ideas, which leads to the *Compliance* of *Authors* which would further the goals of *Open Access*.

Fig 38. The *Open Access Repositories* property.

3.2.4.3.2 *Property: Open access journals*

Librarians in their involvement with *Open Access Journals* are especially burdened by the task of providing *Digital Object Identifier* (DOI) for the works cited, as well as outbound linking, both which are deemed very time-consuming. Other suggestions for value added features that could be performed by *Librarians* are tagging, *Creative Commons BY attribution* (CC-BY) licensing, following DOAJ country statistics, listing of preprint servers and repositories, indexing of open access books in WorldCat and OAIster, and locating open access content (Borchert & Fielding 2014).

Excerpts from Borchert and Fielding (2014) identified that *Librarians* have three stages of management when engaging with publishing. These stages are the start-up, post-launch and special services and challenges. For a start-up to be successful there is a need for *Librarians*, prior to launch, acquire the necessary skills needed for its success. This entails training in negotiations between the *Libraries* and editors, marketing and journal design. When proper training has been acquired, the journal is ready to launch. During the post-launch stage librarians need to assign production editors, which are often library personnel or librarians. They are tasked with the removal of technical obstacles, which enable journal editors to concentrate on what they do best, namely selecting content for dissemination. Production editors are tasked with adding ISSN and DOI, and are engaged in *liaison* activities. Managing *Preservation* processes another important task that the production editors need to consider. The special services and challenges stage is aimed towards the particular needs that the launched titles have, these

activities range from mundane to time-consuming and are exemplified by digitisation, batch-loading or transitioning journals to full *Open Access* accordingly.

Regarding the design decisions for an *Open Access Journal*, there is need for standardisation through templates to ease the process of launching, which could also aid the reduction of cost related to set-up of journals. If *Librarians* are trained in design, this is possible. The design should also align with the standards that the hosting institutions have established. Furthermore *Librarians* should be ready for constant modification of launched journals and should be aware of basic journals standards such as the contribution of contact information and information about the editors, editorial board affiliations, as well as clearly defined rights information. New Web 2.0 services could be used to enhance the journals through embedding of services such as RSS and social media sharing tools (see for example Borchert and Fielding 2014).

Property: Open access journals
Description These concepts are theoretically sorted into this property as they regard how <i>Libraries and Librarians</i> engage with <i>Open Access Journals</i> .

Fig 39. The *Open Access Journals* property.

4 Discussion and review of earlier literature

This chapter aims to illustrate the *relevance* and *modifiability* of the emerged core-category and categories presented in chapter 3 as they are discussed in the methodology of chapter 2. Relevance and modifiability are two of the four criteria used for determining the quality of a grounded theory, and will be determined through a review of earlier literature. Besides looking at relevant books and dissertations, the author of this thesis revisited LISA and LISTA in search of literature reviews, theories and grounded theories conducted in library and information science that focuses on open access or the different aspects and manifestations of open access and other relevant topics that emerged through the theoretical sorting represented in chapter 3. The literature found is then compared to the findings of the thesis. This is not to increase saturation of the categories emerged during analysis, nor to induce new data, but to identify the divergences and convergences between the grounded theory, as described by the core-category and the categories, and the review below. Relevance is determined by concluding the convergences, and the modifiability is determined by concluding the divergences and whether the grounded theory is open to this new knowledge. The structure of the discussion is constructed according to the core-categories and categories.

4.1 Open access

The ideas and manifestations of open access as it is presented in the analysis, mainly its beneficial attributes regarding access and visibility of research, is consistently found in the literature. Regarding growth of open access, it being an important and significant indicator of the movement success, has been treated by McGrath in several of the reviews on current literature that he performed in *Interlending & Document Supply* (2011; 2012; 2015). In McGrath (2015) he looked back at 12 years of his reviews, where he considered open access to have the biggest impact on his field next to the “Big Deals” that publishers offered to the libraries in the midst of the serials crisis. He lifted the considerable growth of open access during these years, and pointed out that 20% of the content previously handled by interlending now are covered through open access outlets. McGrath anecdotally stated that the literature of interlending and document supply was itself reaching 50% availability through open access, but underlined this with empirical studies that were claiming the same (McGrath 2015). McGrath mentioned this growth of open access in an earlier review, where he included literature that reported that in 2009 the number of open access articles had reached 7,7 % of the entire corpus of peer-reviewed articles, a tendency that had continued into the year of his writing (2011). *Science Technology Engineering and Mathematics* (STEM) journals were reported to be the major receiver of the totality of this number of contributed articles (McGrath 2012).

In the analysis chapter in the thesis, it is mainly open access repositories, and especially institutional repositories, that are covered when the *manifestations* of open access are treated. Calhoun (2014) discussed both subject-repositories and institutional repositories

and their potential for positive impact on scholarship and the economic and social value of digital libraries in her chapter *The prospects of open access repositories*. The reservations made about open access repositories are according to Calhoun (2014) the lack of clarity regarding the purpose and focus of the repositories, a weak understanding of the needs and attitudes of the scholarly community, weak awareness of repositories and their benefits on part of the scholars, and of acquiring needed content.

Regarding the acquirement of needed content, in the analysis represented by the *Critical Mass* dimension of the *Open Access Repositories* property, this is treated in a grounded theory of scholars' willingness to publish in open access journals by Park & Qin (2007). Park & Qin (2007) stated that what is true for *Open Access Repositories* is also true for *Open Access Journals*; without content there will be no open access. In the thesis we see how this is challenged by the *Authors'* lack of compliance regarding *Self-archivation*. Park & Qin (2007) stated that it is important to understand what drives and motivates authors in their role as contributors to scholarly communication in their publishing activities, and fruitfully translate their needs into an open access environment. There is a need for libraries to present the value that open access repositories are contributing to the scholarly community in a way that caters to the authors' needs. Nagra (2012) addressed this as well in her review of literature on the subject of open access institutional repositories, where she discussed why academic institutions should engage in the development of them, and what the benefits are if they do both for libraries and the institutions they serve. Institutional repositories have become, according to Nagra (2012), necessary tools for dissemination and presentation of scholarly communication produces by institutions. By employing institutional repositories collaboration between scholars can be encouraged globally and locally. Institutional repositories can archive content for future access and use in projects. Repositories can also act as marketing tools that make the output of an institution visible, which can attract donors and investors interested in the projects being conducted. The research sharing mechanism of institutional repositories is also beneficial in knowledge generation in general, as they allow researchers to stay current and avoid duplications of effort. The benefits that the institutions that host the repositories receive are an increased access and visibility of their scholarly output, and digital preservation capabilities.

The issues of authors' reluctance of engagement with open access publishing are presented in the *Authors as Barriers* property of the *Barriers of Open Access* sub-category, is supported in the review of earlier literature. Although the green manifestation of open access were by Collins (2012) reported to be preferable by authors and publisher due to it being non-disruptive to traditional scholarly communication they also reported on its slow uptake. Suggestions to amend this were to introduce mandates on the institutional level that requires authors to self-archive. Where there is a lack of understanding and unawareness about open access, such as scholars having troubles identifying open access journals and show confusion of what it entails to self-archive and what an institutional repository is, libraries can step in to act as both educators and promoters. Authors' reluctance to engage with institutional repositories was here presented as the major impediment to the success of them (Collins 2012).

Strategies to promote institutional repositories were also reported by Collins' (2012) review where the suggestions included "developing value-added services for authors, such as help support, user guides, and statistics; and establishing a self-archiving policy tied to a financial incentive" (p.144).

4.2 Authors

Davis & Walters (2011) reviewed literature that empirically described the use and access to scholarly literature from the perspective of scholars. Their review made use of literature that were both obtrusive, like interviews, and unobtrusive, like citation counts, to make a case of both what scholars say they do and what they actually do in their interaction with free and open access. Davis & Walters (2011) argued from their findings that while the greater availability that open access offers has impacted the scholars in their role as readers, where reports of ease of access and broader and more frequent reading of literature were found consistently, it has not affected their role as authors as much. Davis & Walters (2011) concluded that scholars, when they publish, are more concerned with career advancements through considerations of journal reputation, readership, impact factor, quality of peer-review and speed of publication, than they are with issues such as access status and copyright. This points to how, in the analysis, *Authors* in their role as *Researchers* are positively affected by the *Benefits* found in the *Open Access* core-category, but that they in their role as *Content Providers* are more concerned with their professional realities.

The tendencies found by Davis & Walters (2011) are also concluded by Park & Qin (2007), in their grounded theory of how authors publish in and uses open access journals. Their grounded theory is the only one that the author of this thesis found that explores open access in the context of library and information science. Park & Qin's (2007) grounded theory exposed the factors involved in scholars willingness to publish in open access journals and how scholars make use of the content that is published as open access, as well as the relationships found between these factors. Their findings tie to the *compliance to non-compliance* dimension of the *Authors' Open Access Behaviour* sub-category, but also uncovers why *Authors* use *Open Access Journal* content. The use of open access journals are not thoroughly discussed in the findings of this thesis and Park & Qin's (2007) findings are therefore considered as a good expansion of the *Authors* category.

Open access journals were at the time of writing for Park & Qin (2007) not held in any particular high regard by the scholarly community with no indication of an increased acceptance of them. To understand the mechanics of this lack of acceptance was what prompted Park & Qin (2007) to conduct their grounded theory, which used interviews with authors of scholarly content as data. Their interviews provided seven identified factors of scholars' willingness to publish in open access journals. These factors were associated with the core activities of scholars in scholarly communication that Park & Qin (2007) identified to be the core-categories of their willingness theory; to *publish* and *use* content. The seven factors were; *perceived journal reputation*, *perceived topical*

relevance, perceived availability, perceived career benefit, perceived cost, perceived content quality, and perceived ease of use. The unidirectional relationships between the factors were also established (Park & Qin 2007, p.66):

Publishing in Open Access journals
<ul style="list-style-type: none"> • Journal reputation positively affects career benefit • Topical relevance positively affects journal reputation • Career benefit negatively affects cost • Availability positively affects career benefit
Using Open Access journals:
<ul style="list-style-type: none"> • Content quality positively affects journal reputation • Journal reputation positively affects content quality • Topical relevance positively affects journal reputation • Availability negatively affects content quality • Availability positively affects ease of use

Table 7. (adapted from Park & Qin 2007)

The *perceived career benefits* were by scholars seen as positively affecting the willingness to publish, according to the analysis that Park & Qin (2007) made. Here the normal function that any scholarly journal has in scholarly communication was described as to provide chances for tenure and promotion for scholars through the publication of their research results. The importance of this factor were for Park & Qin (2007) something that varied depending on whether the authors are currently accomplished in or recently started their academic careers, where non-tenured scholars are correlative willing to comply with publication the higher the prestige of an open access journal.

To continue to expand on the ideas found in Park & Qin (2007) one can look at the meta-synthesis that Togia & Korobili (2014) conducted on the subject of scholarly authors attitudes towards open access journals. Their findings indicated that scholars, despite being aware of the advantages of open access, and being positive to the idea behind open access, recognise that open access publishing is not yet fully understood or have reached its full potential. Togia & Korobili (2014) also lifted the issues that scholars may have regarding the author-pays-model, as well as the perceived quality, reputation and impact of open access journals. Park & Qin (2007) reported on this as well when they described the factor *perceived journal reputation*, which is the factor describing the collective perceptions that scholars have of open access journals, that affect their willingness to publish articles.

The *topical relevance* factor was described as the need for open access journals to have their subject matter of articles aligned with the interest shown in a given scholarly community. This factor positively affects the willingness to publish. Topical relevance identifies the audiences of journals, which can be relevant to many different academic communities. This is interesting for scholars, as a wide readership is associated with the reward mechanism that drives authors to publish. This relates to both *perceived career benefits* and *perceived availability* (Park & Qin, 2007).

The *perceived availability* factor positively affects scholars' willingness to publish articles in open access journals. Open access journals have, according to Park & Qin (2007), a higher degree of availability as they are not bound by financial access barriers and are disseminated through the web. This was according to Park & Qin (2007) perceived by scholars to have career benefits. They also discussed this availability as an increase of ease of use. Park & Qin (2007) reported on a contradiction between the two factors *perceived availability* and *perceived career benefits*. Here increased availability often was seen as beneficial for the *perceived career benefits*, but these *perceived career benefits* diminished if the perceived *content quality* and *reputation* of a journal were not sufficient. Togia & Korobili (2014) also regarded this when they stated that, while the principles of free and faster access to scholarly content are heralded by scholars, the decisions made if to publish in an open access journal remains the same as they were had they considered non-open access journals, although additional factors such as funding agencies and institutional policies could affect the decision.

The passage of time was found to be relevant in Park & Qin's (2007) factor *perceived journal reputation*. Through the passage of time, the *perceived journal reputation* increases as the survival of a journal over time can be seen as proof of its continuous relevance to a scholarly community. This suggested that as content is amassed in archival issues the journal gains acceptance. As time passes, any uncertainties of quality and sustainability subside. Park & Qin (2007) remarked that in the future, open access journals, if they remain relevant to their users, can have a big role to play due to their progressively earned good reputation. To remain useful, and survive, open access journals need to heed to the *topical relevance* of their subjects as well as *content quality* and offer *career benefit* to scholars that *publish* and *use* their content. This can be put in relationship to the indications that Togia & Korobili (2014) identified, that open access journals are maturing and approaching the quality and scientific impact that the non-open access journals already are perceived to have.

Togia & Korobili (2014) echoed the concerns of scholars in Park & Qins (2007) grounded theory regarding the *perceived cost*, regarding time, money, and effort, that negatively affects willingness to publish in open access journals, in that authors are anxious or misunderstand the author-pay-model. In their meta-synthesis, authors see the author-pays-model as an additional barrier to their work. The concerns of payment stated to be even greater in under-funded institutions, among young researchers and for researchers in developing countries (Togia & Korobili, 2014).

Park & Qin's (2007) grounded theory and Togia & Korobili (2014) regarded open access journals, but their conclusion regarding how authors decide where to disseminate their work can also be translated to open access repositories. Kennan & Wilson (2006) reviewed literature of scholar's engagement with institutional repositories and stated, what has been said many times already, that it is the communication between peers, the chance for career advancement through promotion and tenure, prestige and future funding that drives their publishing behaviour.

4.3 Scholarly communication

The relationship between open access and scholarly communication, that we see in the analysis, can be compared to Park & Qin's (2007) description of the social constructs that are impacting open scholarly publishing. These are the altruistic ideas of the free dissemination of knowledge with the scholarly community and the public, and the pragmatic notion of accumulation of knowledge that is increased with a faster, wider, and more effective dissemination. They argued that the factors they uncovered for the publishing behaviour of scholars are significant for the understanding of the motives and behaviour that undermine the acceptance of open access through misunderstandings and how open access should tie into the rewards systems that drives the scholars careers. Park & Qin (2007) recognised the higher degree of availability that open access brings to scholarly communication. This is something that they concluded can serve scholars through the chance of increased citations and therefore a higher impact-factor, and the potential for authors tenure and promotion.

In the reoccurring literature review in the journal *Interledning & Document Supply* managed by Mike McGrath, open access is discussed both as its own topic and in relation to other topics, such as the impact of open access to the scholarly communication landscape. In McGrath (2011) open access is reported to have established itself as an important feature of scholarly communication. Regarding commercial publishers McGrath (2014) lifted the risks of open access journals, in which the tendencies for some commercial publishers is to “double dip” its author-pay fees, meaning they receive the profits from established author-pay fees but do not reduce the costs for their subscriptions accordingly. McGrath (2011) also states that the real threat to publishers, regarding how open access encroaches on their business models, are found in the green model of open access and not in the gold model. He argues that golden open access mainly open up for publishers to both retain control of authors output as well as securing additional revenue streams.

4.4 Developing countries

Relevant to the *Developing and Transitional Countries* category is Jutta Haiders (2008) discourse analysis of open access and its role in developing countries, presented in her dissertation. While this thesis considers the category *Developing and Transitional Countries* as a conditional for the core-category *Open Access*, as the circumstances that dictate *Scholarly Communication* was found in the data to be different in developing countries if compared to those of developed countries, Jutta Haider (2008) went much deeper in the relationship between the concepts. She approached the relationship between open access and developing countries with the perspective of post-development studies and a focus on the language practice and discourses inside them. Haider (2008) lifted the discourse of open access in its relation to the developing world, where open access “emerges in three guises, sometimes concurrently, as a development problem, as a tool for development, and finally as the measure of development itself” (Haider 2008, p.147). In these three guises, open access is stated to act as both the affirmation and counterweight to the dominance of western science, which in the discourse is a

transferable, international, and more mature form of knowledge that the developing world is lacking, in which open access comes to represent a set of ideas of what it means to be developed or developing (Haider, 2008). She also lifted how open access can be used to make visible the inequalities of intellectual property regimes, and how it can be used to protest this through free availability (Haider, 2008).

Haider (2008) also identified four barriers to open access “(1) technological barriers, (2) the ‘developed world’ and the development apparatus, (3) the people, (4) government or politicians of the ‘developing countries’” (2008, p. 188). The most discussed issues were identified by Haider (2008), to be infrastructure, such as internet access, electricity and power failures, server maintenance, or the availability of computers (Haider, 2008). This was reflected by the data in the thesis, but Haider (2008) also discusses the political and educational circumstances of developing countries such as illiteracy of the people, funding, the presence of civil wars and armed conflicts, and other issues that may occur in unstable states that wish to pursue open access, which is lacking in the data for this thesis.

Davis & Walters (2011) stated an important difference between developed and developing countries that there is a higher reliance in developed countries on commercially controlled scholarly communication, while in developing countries they rely on the informal circulation of articles, research and ideas between scholars. This is because developing countries institutions simply cannot afford the competitive price of commercially controlled content. In developed countries it is usually through institutional or library mediation of scholarly communication that research is disseminated.

4.5 Libraries and librarians

Ghosh (2011) review of works pertaining to the advocacy of open access considered the need for a reformation of the cultural aspects of libraries to be able to properly establish open access models for dissemination of scholarly content, in which especially institutional repositories have become a natural part of academic libraries. He argued that the current scholarly communication landscape has an increased demand of the development of skills, knowledge and experience with and about the different models among librarians. This is something that the analysis in this thesis states repeatedly. To Ghosh (2011), the retraining of librarians was necessary for libraries to be able to utilise the potential that the models offer, which end result would be that libraries and librarians can claim a key role in scholarly communication. For instance, suggestions from the literature reviewed by Ghosh (2011) are that library programmes should offer training of advocacy skills such as marketing, public relations and advocacy. The close association between advocacy for open access and marketing was lifted as something closely related as the skills needed for the different activities are quite similar. The key elements for effective advocacy of institutional repositories were also lifted, which are the inclusion of all affected stakeholders, and the devising of a plan and a unified message that is powerful enough to persuade and inform the opinion makers, policies

and public about the advantages of institutional repositories. This can lead to coalitions that can further the library agenda, which seems to be closely tied to that of the open access movement (Gosh 2011). Writing up a plan was stated as being the easy part, where the hard part was to orchestrate investments of the manpower, time, and commitment needed for the advocacy to be fruitful, which could be easier should libraries find suitable collaborators (Ghosh, 2011). Through being informed and competent proponents and active advocates of open access culture both inside their institutions and in a global community, the cultural barriers of scholarly communication, disciplines and of libraries themselves can be overcome. Ghosh (2011) stated that sustainability is another key issue that needs to be addressed for libraries to be able to assume their central role in dissemination of open access content. Libraries need adequate funding, in which there is need for increased government spending on library related open access endeavours.

In an article in *New Monday* Ajit Pyati (2007) made the case for a theoretical framework, a critical theory of open access, that libraries can assume in their work within scholarly communication. Critical theory is a normative social theory that takes a progressive stance to the dynamics in society and aims for empowerment of the oppressed, and Pyati's (2007) critical theory of open access was described as a reaction to the neo-liberal tendencies of publishers to commodify information, to which libraries are subjected and forced into what has become the scholarly publication crisis, consisting of galloping subscription prices and shrinking collections, reduced library budgets, and more complex navigation of the copyright and license environment. As recognised in the thesis, this is operating solely on the needs of the libraries and librarians affected by the *Serials Crisis*, but also affect the equity of access to scholarly content to the public.

Academic libraries were according to Pyati (2007) reacting to the serials crisis with an adherence to their fundamental principles of acquiring and maintaining access to content and with knowledge about the new technologies made available through the internet. In this construct, libraries can assume the role of technologically based activists that challenges the traditional role that libraries has played in scholarly communication through assuming the role of publishers themselves, either through gold or green approaches to open access, and by forming alliances with different actors in scholarly communications (Pyati 2007).

The issue of clashing perspectives between the needs of scholars and libraries found in Pyati (2007), where the needs of the library to solve the serials crisis is championed by its librarian advocates, is also found in Davis & Walters (2011) where they stated that the quality of scholarly journal articles and the peer-review they go through are for authors of major importance, while the cost of the entire scholarly communication system is not. The authors preferences are thoroughly presented by Davis & Walters (2006), Kennan & Wilson (2006), Park & Qin (2007) and Togia & Koroboli (2013) above. This of course contrasts with the view that libraries and librarians have of the scholarly communication crisis regarding both economics and the political and moral weight of accessibility. Here it is a clear need for building cooperation and alliances

between authors and libraries for the good of scholarly communication through open access, as stated by the analysis in the thesis.

The newness championed by the library literature is also contested by the conservative views that dominate scholarly communication and their relentless dedication to disciplinary norms in their research cultures and the process of peer-review. Room for experimentation in scholarly communication are under these circumstances limited (Davis & Walters 2011). Author-pay-fees, for example, are at odds with the conservatism of many scholarly communities, which provide an additional impediment to a broader participation in open access initiatives (Davis & Walters, 2011).

Hagerlid (2011) discussed the significance that a national library can have in the context of developing infrastructure and policies for open access institutional repositories, through the experiences of Sweden's national library in its work with the OpenAccess.se programme. The national library of Sweden signed the Berlin Declaration in 2006, and the policy that followed from their signing was designed to support the open access manifestations, metadata, open access to digitised heritage materials, and open access perspectives on the licenses concerning digital resources. Hagerlid (2011) concluded that national libraries can become catalysts for the cooperation of research libraries and their parent institution, which are the main bodies of research, which could result in the progress of the open access agenda. This is achieved through the particular advantages that a national library has, in comparison with their institutional counterparts. National libraries are in closer proximity to the national policy-making, and they are perceived as unbiased in their interest in pursuing open access. Regarding the latter advantage, regarding bias, Hagerlid (2011) reported that in Sweden there has previously been an atmosphere of competition between the leading universities regarding the initiative and leadership of open access, but that it has since the involvement of the national library transformed into an atmosphere of cooperation. Furthermore, national libraries can, compared to institutions that work individually, develop projects into sustainable alternatives (Hagerlid, 2011).

While the importance of Libraries and Librarians in the role of advocates and educators in open access matters are thoroughly stated by the data in the thesis, the perspective of librarians in this role have been awarded little attention. Keane (2012) stated, just as the data in this thesis has suggested, that libraries and librarian are increasingly believing that they are professionally obliged to promote and advocate open access, due to that the goals of open access and the values of the librarian profession are coinciding. Keane (2012) went beyond this statement with a discussion about the perspectives that librarians involved with the advocacy and education of open access targeted specifically to the future researchers found in students. Most librarians were either positive and engaged in typical advocacy activities, or positive but lacking the time, fund or support needed to engage. Dissenting opinions on education of students were found among librarians as they found that the effort required would not be appropriate for undergraduate students or if the students were enrolled in community college because of factors such as low publishing activities. Other dissenting opinions were associated with

the absence of a policy that could direct the involvement, or the direct disengagement of students regarding the research process (Keane, 2012).

5 Conclusion

The core-category *Open Access* and the categories *Authors*, *Scholarly Communication*, *Developing and Transitional Countries*, and *Libraries and Librarians* were identified by following the methodology in chapter 2. Through coding, constant comparison, and theoretical sorting the core-category and the categories that make up the grounded theory literature review could be presented in chapter 3. The core-category and the categories were conceptually related through the identified relational statements that were both interwoven in the body of text and summarised after each section. The validity of the emerged grounded theory, being the substantive data and the relational statements found in the core-category and the categories, were tested regarding the relevance and modifiability of the categories through the comparison of the emerged grounded theory and a discussion building on a review of earlier literature in chapter 4. In this concluding chapter, the author of the thesis will restate the emerged theory and will also try to capture the complex relating of concepts that was found in the grounded theory literature review presented in chapter 3 through the construction of narratives built from the discovered relational statements in a way that adequately answers the research questions stated in chapter 1.

5.1 A theory of open access

Through the inductive process of applying grounded theory as a systematic and rigorous approach to conducting a literature review, several categories emerged as conceptual descriptions of the subject of open access as it was found in literature relevant to the field of digital library research. These categories, where one was identified as a core category due to it describing the central phenomena targeted for research, and the relational statements identified between the categories make up the grounded theory of how open access as a subject is reflected in digital library research.

As the core-category is the main phenomena under study, *Open Access* rose naturally as the core-category. The other categories were theoretically sorted according to them being identified as subjects that were discussed in conjunction to the core problems represented in the core-category. The relationships between the core-category and the categories were identified through the identification of relational statements uncovered during the coding process. These relational statements represent the interactions that actors, institutions, and other entities have with the core-category, as a way to describe what is going on in the data.

The *Authors* category covered concepts regarding the impact that open access have on the work flows of scholars regarding the dissemination of their scholarly output and the interaction they have with the ideas of open access. *Authors* were identified to be central to open access as they are the contributors of the content that can possibly be disseminated according to open access principles, and this was reflected in the focus on the authors behaviours and attitudes towards open access.

Scholarly Communication as a category was related to open access through it being the main target of the progressive change of the access and use of the content being disseminated through the processes identified within the category. The revolutionary potency of open access in scholarly communication were covered in the sub-categories regarding the increase of accessibility, visibility and usability of scholarly communication.

In the category that represented the concepts of open access as they are perceived in developing and transitional countries, it was seen that these countries have a particular interest in open access as it can bring scholarly communication to them without economical and access barriers. This interest and potential for economic relief is hampered by certain circumstances that are represented in the subcategory that covers the realities these countries are facing in their work with open access.

Libraries and Librarians are central actors in scholarly communication as both users and providers. Therefore their interest in open access is how this movement can enhance their work in providing access to scholarly communication to a wider audience for less money. Through the theoretical sorting of this category, it was shown how libraries and librarians are both idealistic and pragmatic in their approach to interacting with open access. Through open access, they can (re)take a central role in scholarly communication, and become users, providers, and publishers of content while solving issues such as the serials crisis.

5.2 Narratives

The complex relationships between the categories that emerged in this grounded theory literature review are very hard to capture in a unified model that would make sense for the reader. Therefore the author of the thesis will below try to capture their relationships by constructing narratives derived from the relational statements as they were summarised in the figures in chapter 3.

The main research question was:

“How is the subject of open access reflected in the literature published in the field of digital library research?”

An additional research question were stated in the introduction:

“In what contexts are the subject of open access discussed in digital library research literature, meaning; what subjects are discussed in relation to open access and how do they relate to each other and open access?”

They will both be covered in separate sections following directly below.

5.2.1 How is the subject of open access reflected in the literature published in the field of digital library research?

Open Access, as represented in the core-category, is an ideology of and a tool to ensuring free access and availability to scholarly content through the internet for anyone to use and distribute. *Open Access* is also reflected as a process towards an end-goal, where the benefits and potential of the success of the movement must be championed by *Librarian* advocates and other proponents so that the awareness of its potential is raised by the key stakeholder, and where the *barriers* need to be overcome for its success. *Open Access* as a tool to this end is made manifest through *Open Access Repositories* and *Journals*. The progression of the ideas of *Open Access* is made possible through the use of these *manifestations*, which in turn only can happen if the key stakeholders are *aware* of the manifestations and that the *manifestations* are successful in acquiring the needed amount of content from the key stakeholders so that its usefulness is established. The *Authors* category are by the data reflected as the key stakeholders that in their role as *Content Providers* populate the manifestations with works that ensures the progression towards free access and *availability* of scholarly content. Their interactions with the *manifestations* of *Open Access* are shaped by their *Attitudes to Open Access* and their *Open Access Behaviour*, which are often in conflict. This is reflected in how *Authors* often agree with the ideology of *Open Access*, but when they choose where to publish are mainly motivated by the advancement of their careers, and disregards whether they publish their content as open access or not. This dissonance is shown in the *Compliance* dimension of their *Open Access Behaviour*. *Compliance* of *Authors* is assured through the leadership that *Libraries and Librarians* have assumed in the open access movement and the *Advocacy* they perform for its progress. The fundamental values in the profession of *Librarians* reflected in their mission to provide free dissemination are tying *Libraries and Librarians* to the progress of *Open Access* and compel them to persuade and educate *Authors* of the *Benefits* that *Open Access* entails. The success of their *Advocacy* is dependent on that *Libraries* are successful in realigning their needs with that of the *Authors*. When *Advocacy* successfully persuades *Authors* to comply with the ideas of *Open Access*, possibly with the help of mandates and policies set up by the hosting institutions or other significant funding bodies, the potential that *Open Access* offers can be realised which will result in the increase of *Accessibility*, *Visibility*, and *Usability* of *Scholarly Communication*. The *Open Access* ideology of research as a common good is thereby made a reality. This push towards *Open Access* breaks the stranglehold that *Commercial Publishers* have over *Scholarly Communication* and relieves *Libraries* from the pressure that the *Serials Crisis* puts on library budgets and *Authors* gain an increased *Readership*. A new era of *Scholarly Communication* can then begin, where *Libraries and Librarians* are free to create new services for dissemination from a central position in this new information environment.

5.2.2 In what contexts are the subject of open access discussed in digital

library research literature, meaning; what subjects are discussed in relation to open access and how do they relate to each other an open access?

Authors are at the same time the key-master and the gate-keeper of the progression of open access. The altruistic ideal inherent in the *Open Access* movement has claimed to change the publishing behaviour of *Authors* fundamentally, yet *Authors* are continuing to behave as they have done previously regarding publication of their research. Traditional *Scholarly Communication* and the conservatism of the research cultures that *Authors* are operating in are here determining *Authors* publishing behaviours. The benefits of the traditional scholarly communication model have not yet been accurately translated and understood enough to actualise the vision of the *Open Access* proponents. Due to this, *Authors* are found to be a major *barrier* to the progress of the movement in that they often ignore the *Benefits* of *Open access* because of the realities found in their profession. *Authors* can be described as the silver bullet that determines the success of *Open Access*; it is through their choices of where to publish that *Open Access Repositories* and *Open Access Journals* receive the *Critical Mass* needed to establish the *manifestations* as permanent channels. To achieve the success of *Open Access* there is a need for *Libraries and Librarians* to align their needs with that of the *Authors* as well as the *Open Access* ideology. They can do this by acquiring the proper skills and to offer education and *Advocacy* directed to the *Authors*.

The issues and potential of *Open Access* are of great interest to *Libraries and Librarians*, which are a. *Libraries and Librarian*, especially those active in an academic setting, are increasingly identifying themselves as the leaders of the *Open Access* movement, and are increasingly engaging in activities pertaining to the *manifestations* of *Open Access* and of *Advocacy* to realise the movements goals. Their values are identified to be aligned with that of the movement, where free dissemination of ideas without barriers is the main driving force for their participation. Interestingly, the driving force of *Libraries and Librarian* towards *Open Access* seems to be not so much because of the benefits that *Authors* receive such as *Increased Availability* and *Increased Visibility* of their contributed content, or even the *Increased Usability* that readers of this content receives. Instead it seems that the *Serials Crisis* is the main factor that determines whether *Libraries and Librarians* engage with open access. If *Open Access* perservere as an alternative to traditional *Scholarly Communication*, *Libraries* will get rid of the looming *Serials Crisis* that is crippling their budgets. This shows how *Libraries and Librarians* have adopted a pragmatic and survivalist stance to the ideas of *Open Access*. Of course, this does not mean that the altruistic ideas of *Open Access* are unimportant. In the review of earlier literature, we could see that there was a call for progressiveness and standing against the commodification of research that were prevalent in the literature, which was also found in the data collected for this thesis.

Librarians are lifted as mediators between the reluctant and *non-complying Authors* and the ideas of *Open Access*, which they do through promotion both from an ideological standpoint, where the ideas of enhanced *availability* and *visibility* of research hastens

the research process and disseminates research to the public, and through practical engagement in developing value-added services to the *Open Access manifestations* and offering support in the *Authors* work-flow when they choose to engage. To be able to perform these duties successfully there is need for the training and education of *Librarians* so that they acquire adequate *Skills* for management of *OA Manifestations*. *Librarians* can through this push *Authors as Content Providers* towards *Open Access* activities such as *Self-archiving* in *Open Access Repositories* and publishing in *Open Access Journals*.

Scholarly Communication are in the context of *Open Access* presented as simultaneously a traditional and a rapidly changing landscape of information exchange. Currently this landscape is dominated by the *Commercial Publishers*, which have no interest in changing the mechanisms of dissemination as their focus is to attain new and retain old streams of revenue. *Open Access* is in this context a revolutionary, innovative, or plain different way of dissemination that is reclaiming the way in which scholarly content where previously disseminated; for free, between peers, for the good of knowledge and the society. This change is made possible through the use of new technology, which is challenging the traditional power balance of *Scholarly Communication*, where *Libraries and Librarians* have an opportunity to claim a central position for themselves. As *Open Access* technology progresses, *Scholarly Communication* will see an increase of the *Availability* and *Accessibility* of research. *Preservation* of the same content will prove to be a challenge for the future that must be taken seriously by the digital libraries and digital librarians that are engaged with *Open Access Manifestations*.

Both the challenges and the benefits of Open Access are enlarged when they are met with the circumstances that *Developing and Transitional Countries* are struggling with in their change towards a more *Open Access* landscape. While developing countries does benefit from the cost-saving mechanisms of content made available as *Open Access*, and are able to connect to the global community through the *manifestations*, the challenges of upholding the infrastructure, and acquire the skills needed to make it function properly, and the knowledge needed to properly engage and educate the *Authors* active in the communities are harmful in a way that is not apparent to the developed countries in which *Open Access* is discussed normally. It is important to address this digital divide between information haves with the information have-nots, so that these are not left behind in the progress towards the new promised land of *Open Access*.

5.3 Limitations

Grounded theory is a time-consuming method. This has proven to be a major limitation of the thesis as it forced the author to suffice with the first iteration of the searches during the data collection phase due to time constraint. Although many properties, dimensions and categories emerged during the data collection and analysis, many more could of course be discovered had there been time and with an increased theoretical

saturation. At the same time, a literature review can really never be said to be completed. New literature and relevant research is continually being produced, which would be impossible for any one researcher to complete. Literature reviews are cumulative, like any research, and the role of this thesis should be seen in the light of that cumulative nature.

5.4 Suggestions for further research

Further research for the research of this thesis is most suitably performed in considering the nature of the emerged grounded theory. The narratives above suggests that open access in digital library research is reflected as a process towards the global availability of all or most of research produced to anyone for free disseminated through the web. A process that is made actual by the participation of contributing authors and the advocacy and education done by libraries and librarians.

First and foremost, research done to test and verify the validity and replicability of the emerged theory could be done. This could be done for example by approaching the subject matter with alternative methods, such as discourse analysis or meta-analysis, or conducting traditional grounded theory based on interviews with involved actors.

Another suggestion is based based on that while the role of libraries and librarians in their advocacy of open access is lifted substantially in the data, the changes in the practical reality of working with open access in a library setting are a rare sight. Here the perceived professional identity and/or the changing roles of libraries and librarians due to the restructuring of scholarly communication can be explored.

5.5 Closing remark

While the author of this thesis recognises that the limitations of time has affected the saturation of the categories that emerged during the coding process, the author also recognises that several categories, with their properties and dimension, has truly emerged from the data and only from the data in a way that adequately captures the ideas and potential of open access as it is represented in literature relevant to digital library research. This is to an extent supported in the discussion and review of earlier literature which at the same time validates the results of the analysis and in many instances also widens and deepens the subject, letting us know that much is yet to be discovered. The author hopes that the work invested have resulted in what he set out to do, namely creating a conceptual traveller's guide to the exciting subject of open access.

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Appendix A. List of publications and number of articles found in each

Journal	#
ACN 2010	1
Ariadne	6
Australian Academic & Research Libraries	2
Collection Building	1
D-Lib Magazine	9
Feliciter	1
IFLA Journal	1
Information Services and Use	2
Information Technology & Libraries	1
Interlending & Document Supply	2
International Conference on E-learning and E-technologies in Education 2012	1
IST Africa 2010	1
Journal of Documentation	2
Journal of Electronic Publishing	1
Journal of Electronic Resources Librarianship	1
Journal of Information Science	1
Journal of Interlibrary Loan, Document Delivery and Electronic Reserve	2
Journal of Scholarly Publishing	1
Journal of the American Society for Information Science and Technology	1
Law Library Journal	3
Lecture Notes in Computer Science	5
LIBER Quarterly	1
Library Hi Tech	4
Library Philosophy & Practice	2
Library Resources & Technical Services	1
Library Review	1
Malaysian Journal of Library and Information Science	3
New Library World	1
New Review of Academic Librarianship	3
OCLC Systems and Services	1
Online Information Review	1
Science and Technology Libraries	1
Serials Librarian	6
Serials Review	2
The Electronic Library	1
The Grey Journal	1
TPDL 2013	1

Appendix B. Coding Maps

Year	Author(s)	Core-category: Open Access	Sub-category: Barriers to open access	Sub-category: Benefits of open access	Sub-category: Open Access Manifestations
2010	Abdullah, A.	x	x	x	x
2010	Adema, K. Schmidt, B.	x	x	x	x
2014	Ahmed, A., et al.	x	x	x	x
2012	Baba, K.a , Mori, M.b	x			x
2010	Benz, D. et al.	x		x	
2014	Bhardwaj, R.K.	x			x
2011	Biagioni, S.	x		x	
2014	Bjork et al.	x		x	x
2014	Bjork, B.C.	x	x	x	x
2014	Borchert, C.A. Fielding, J.	x	x	x	x
2012	Breeding, M.	x			
2010	Cassella, M. Calvi, L.	x	x	x	x
2014	Chen, X.	x			
2014	Cho, J.	x			x
2013	Chowdhury, G.G.	x	x	x	x
2014a	Chowdhury, G.G.	x	x	x	x
2014b	Chowdhury, G.G.	x	x		x
2012	Cimen, E.	x	x	x	x
2010	Creaser <i>et al.</i>	x	x	x	x
2011	Danner, R.A et al.	x			x
2014	Eng, A., et al.	x	x	x	x
2010	Eun-Ja, S.	x			x
2013	Ezema, I. J.	x	x	x	x
2010	Ferwerda, E.	x	x		
2010	Georgiou, P., Tsakonas, G.	x			
2012	Gramstadt, M.T.	x	x	x	x
2011	Grgic, I.H. Barbaric, A.	x	x	x	x
2012	Hamad, S.	x	x		x
2014	Hayes, C. Holley, R.P.	x			x
2011	Hitchcock, S., Tarrant, D.	x			x
2013	Houghton, J, Swan, A.	x			x
2013	Jones, D.R.	x	x	x	x
2010	Kamraninia, K.	x	x	x	x
2012	Keele, B.J.	x			x
2014	Keener, A.	x		x	x
2015	Kim Wu, S.K., McCullough, H.	x			x
2010	King, D. W.	x	x		x
2014	Latif <i>et al.</i>	x			x
2015	Lawton, A., Flynn, E.	x		x	x
2014	Lehman, K.A.	x	x	x	x
2012	Lesk, M.	x	x	x	x
2011	Loan, F. A.	x	x		x
2010	Martin, R.A.	x	x	x	x
2011	Nykanen, M.	x		x	x
2013	Ozono, T., et al.	x			x
2010	Polydoratou, P. et al.	x			x
2010	Puplett, D.	x		x	x
2010	Quinn, B.	x	x	x	x
2014	Rizor, S.L., Holley, R.P.	x	x	x	x
2013	Robertson, W.C. Simser, C.N.	x			x
2011	Seadle, M.	x			x
2010	Segberg-Elbert, M.	x	x	x	x
2012	Sen, B.	x			x
2012	Shotton, D.	x	x	x	x
2013	Smith, K. Davis, S.	x	x	x	x
2011	Stanton, K.V.a , Liew, C.L.b	x	x	x	x
2014	Steele, C	x	x	x	x
2013	Thomas, W.J.	x			x
2013	Tsuchide, K., et al.	x	x		x
2012	Uddin, M.N. et al.	x	x	x	x
2012	Unuegbu, C. P., & McAlibert, F. U.	x	x	x	x
2013	Velarde, D.	x	x		x
2013	Vierkant, P.	x			x
2011	Wacha, M., Wisne, M.	x	x		x
2013	Wiegand, S.	x	x		x
2011	Xia, J et al.	x	x		x
2012	Xia, J., Nakanishi, K.	x			x
2010	Xu, H.	x	x		x
2010	Zainab, A.N	x	x	x	x
2014	Zhao, L.	x	x	x	x
2014	Zuniga, H.	x			x

Year	Author(s)	Category: Authors		
		Sub-category: Attitudes to open access	Sub-category: Open access behaviour	
2014	Bjork et al.	x		x
2014	Borchert, C.A. Fielding, J.	x	x	
2010	Creaser et al.	x	x	x
2014	Eng, A., et al.	x		x
2013	Ezema, I. J.	x	x	x
2010	Ferwerda, E.	x		
2010	Georgiou, P., Tsakonas, G.	x	x	
2012	Gramstadt, M-T.	x	x	x
2011	Grgic, I.H. Barbaric, A.	x	x	x
2010	Kamraninia, K.	x	x	x
2012	Keele, B.J.	x		x
2015	Kim Wu, S.K., McCullough, H.	x		
2010	King, D. W.	x	x	
2015	Lawton, A., Flynn, E.	x		x
2012	Lesk, M.	x		x
2010	Puplett, D.	x		x
2013	Smith, K. Davis, S.	x	x	x
2011	Stanton, K.V.a , Liew, C.L.b	x	x	x
2014	Steele, C	x	x	x
2013	Thomas, W.J.	x		
2012	Uddin, M.N. et al.	x		x
2011	Wacha, M., Wisne, M.	x	x	x
2013	Wiegand, S.	x	x	
2011	Xia, J et al.	x		x
2010	Zamab, A.N	x	x	x
2014	Zhao, L.	x	x	x

Year	Author(s)	Category: Scholarly Communication		
		Sub-category: Commercial publishers	Sub-category: Preservation	
2014	Bjork et al.	x	x	
2012	Breeding, M.	x	x	
2010	Cassella, M. Calvi, L.	x	x	x
2014	Cho, J.	x		x
2014a	Chowdhury, G.G.	x		x
2010	Creaser et al.	x		
2011	Danner, R.A et al.	x		x
2014	Eng, A., et al.	x		
2012	Hamad, S.	x	x	
2014	Hayes, C. Holley, R.P.	x		
2011	Hitchcock, S., Tarrant, D.	x		x
2013	Houghton, J., Swan, A.	x	x	
2013	Jones, D.R.	x	x	x
2015	Kim Wu, S.K., McCullough, H.	x		
2010	King, D. W.	x	x	
2015	Lawton, A., Flynn, E.	x	x	
2010	Martin, R.A.	x		
2010	Puplett, D.	x	x	x
2014	Rizor, S.L., Holley, R.P.	x	x	
2011	Seadie, M.	x		x
2012	Sen, B.	x		x
2012	Shotton, D.	x	x	
2013	Smith, K. Davis, S.	x	x	
2011	Stanton, K.V.a , Liew, C.L.b	x		
2014	Steele, C	x	x	
2013	Thomas, W.J.	x		
2013	Tsuchide, K.	x		
2013	Velarde, D.	x		x
2010	Zamab, A.N	x		
2014	Zhao, L.	x	x	
2014	Zuniga, H.	x	x	x

Year	Author(s)	Category: Libraries and librarians			
		Sub-category: Librarians			
		Sub-category: Librarians			
		Sub-category: Librarians and the manifestations of open access			
2010	Adema, K. Schmidt, B.	x	x	x	
2014	Bhardwaj, R.K.	x	x		x
2014	Bjork et al.	x	x		x
2014	Borchert, C.A. Fielding, J.	x	x	x	x
2014	Cho, J.	x	x	x	x
2012	Cimen, E.	x	x	x	x
2014	Eng, A., et al.	x	x	x	x
2013	Ezema, I. J.	x	x	x	x
2010	Ferwerda, E.	x		x	
2012	Gramstadt, M-T.	x	x	x	x
2014	Hayes, C. Holley, R.P.	x		x	x
2013	Jones, D.R.	x	x	x	
2010	Kamraninia, K.	x	x	x	x
2012	Keele, B.J.	x	x	x	x
2014	Keener, A.	x	x	x	x
2015	Kim Wu, S.K., McCullough, H.	x	x	x	x
2010	King, D. W.	x		x	
2014	Lehman, K.A.	x	x	x	
2011	Loan F.A.	x	x		
2010	Martin, R.A.	x	x	x	x
2011	Nykanen, M.	x	x		x
2013	Ozono, T., et al.	x	x	x	x
2010	Puplett, D.	x	x	x	x
2010	Quinn, B.	x	x		
2014	Rizor, S.L., Holley, R.P.	x	x		
2013	Robertson, W.C. Simser, C.N.	x	x	x	x
2010	Segberg-Elbert, M.	x	x		x
2013	Smith, K. Davis, S.	x	x		x
2011	Stanton, K.V.a , Liew, C.L.b	x	x	x	
2014	Steele, C	x	x	x	x
2013	Thomas, W.J.	x	x	x	
2013	Tsuchide et al.	x	x	x	x
2012	Uddin, M.N. et al.	x	x	x	
2011	Wacha, M., Wisne, M.	x		x	x
2013	Vierkant, P.	x	x		
2013	Wiegand, S.	x	x	x	
2011	Xia, J et al.	x	x		x
2010	Zainab, A.N	x		x	x
2014	Zhao, L.	x		x	x
2014	Zuniga, H.	x		x	x