

**BIAS WITHIN KNOWLEDGE ORGANISATION SYSTEMS: FROM
CRITICAL ANALYSIS TO CRITICAL PRAXIS**

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This dissertation is submitted in part fulfilment of the requirements for the degree of MSc of the University of Strathclyde.

I declare that this dissertation embodies the results of my own work and that it has been composed by myself. Following normal academic conventions, I have made due acknowledgement to the work of others.

I declare that I have sought, and received, ethics approval via the Departmental Ethics Committee as appropriate to my research.

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Abstract

Bias is prevalent within knowledge organisation systems due to the historic worldviews reflected in globally prevalent classification schemes. Furthermore, it is perpetuated by the implicit biases of the information professionals who build and maintain those systems. Bias within knowledge organisations systems is an ethical issue since it affects discoverability of resources, and therefore the ability of users to access information.

In order to discern a way to mitigate bias within knowledge organisation schemes, an extended literature review was conducted to define bias from a psychological perspective and to discover how bias manifests within knowledge organisation systems. Previous suggestions to address biased knowledge organisation systems were then analysed from a critical theoretical perspective.

It was found that without consideration of implicit bias and its effect on cataloguing and classification processes, the proposed solutions do not adequately address the causes of bias.

A new suggestion was proposed in which information professionals undertake bias literacy training in order to develop an awareness of their implicit biases and develop skills to mitigate their effects. It is also recommended that information professionals are encouraged to critically engage with the ethical issues around bias, and move toward a professional culture of critical praxis.

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Figure 1. Adaptation of Carne et al.'s (2012) Conceptual Model: Progressive movement toward habitually acting without bias. p.50.

List of abbreviations

ALA	American Library Association
BISAC	Book Industry Standards and Communications
CILIP	Chartered Institute of Library & Information Professionals
CRT	Critical race theory
DDC	Dewey decimal classification
IFLA	International Federation of Library Associations
KOS	Knowledge organisation system
LCC	Library of Congress classification
LCSH	Library of Congress subject headings
LIS	Library and information science
OPAC	Online public access catalogue

1.0 Introduction

Bias is widespread in our society. People can hold biases about gender, race, religion, ethnicity, education, sexual orientation, class, ability and so on. When we are aware of, and openly acknowledge our biases they are known as explicit biases, but we can also hold implicit associations that are internal and unacknowledged. We may not know we have them, but they can still influence our actions and behaviours, and affect the decisions we make.

Cataloguing and classification consists of a series of decisions, about what things are and how to name them. If implicit bias affects our decision-making processes, then classification systems can contain biases.

The classification systems that we use would appear to be unbiased and universally applicable; however, bias is inbuilt in the systems that we have inherited. The most widely used and influential classification systems on a global scale are products of a certain place and time, and were never intended for a global usership. This particular worldview can still be found reflected in some areas of their classification schedules. There are ethical implications for bias occurring in knowledge organisation systems (KOS), because these biases affect users' ability to access, make use of, and even understand the information in the items catalogued (Bair, 2005; Mathiesen and Fallis, 2008; Spiteri, 2012). The act of labelling and naming oppresses those who do not fall within the dominant majority:

There are few things as quietly powerful as labels. We are completely surrounded by them and for the most part their influence is invisible. They are only seen by the people they hurt.

(Rosenfeld and Morville, 2002 p.312)

Access to information is a human right, and it is the information professional's ethical duty to provide equal access to information for all. Bair states that by their actions, cataloguers have 'the potential ... for great harm or good' (Bair, 2005, p.15). But how can information professionals provide equal access to information for all when they are not only being required to catalogue in biased ways by the systems that they use, but are also being influenced by their implicit biases?

This is an important issue for LIS since bias within KOS affects users' ability to access information; particularly so for those users belonging to minority groups. The ethics of cataloguing, and bias within cataloguing and classification, has been debated to some extent within the LIS literature, and some solutions have been proposed. However, there has been no analysis of the proposed measures to combat bias, nor has there been an attempt to define bias as it occurs within KOS from a psychological perspective.

The purpose of this research is to investigate the issues around bias within KOS, to evaluate the existing proposed solutions to remedy that bias, and to investigate whether a psychological understanding of implicit bias can lead to better solutions to tackle bias, as a step toward systems that provide more egalitarian access to information.

Biased classification does not negatively impact those belonging to dominant social groups, but it has the power to harm those belonging to minority communities (Olson, 2002). Fox and Reece (2012) suggest that the ultimate goal for information professionals is to provide access to information without causing oppression. Information professionals are duty-bound to provide fair and unbiased access to information, so it is the information professional's duty to pursue mechanisms to mitigate the bias present in information systems.

To determine the current state of knowledge on the issue of bias in KOS, an extended literature review was conducted to get a broad overview of the issue. Furthermore, any proposed solutions to the problem were identified and analysed from a critical theory perspective to gauge their efficacy.

The research aimed to address the following research questions:

- How and why does bias manifest in knowledge organisation systems?
- What solutions have the LIS field proposed so far to tackle bias?
- To what extent are they effective?
- Is there a better way to address this issue?

This dissertation will be set out in the following way: chapter two will look at the literature on implicit bias, its causes, and methods to counteract its effects. It will then take a broad view on the issues around bias within knowledge organisation systems and the ethical implications for information professionals. Chapter three will outline critical theory as a methodology for

analysing the LIS texts which offer solutions to the issue of bias in KOS. Chapter four will set out, by theme, some of the proposals suggested for addressing bias within KOS and analyse them from a critical theoretical perspective to gauge their efficacy in combatting bias. Finally, chapter five will describe an alternative approach to remedying biased and prejudiced systems, based on an understanding of implicit bias as a psychological phenomenon, and grounded in a practical application of critical theory.

2.0 Literature Review

The following literature review will first define implicit bias and systemic bias. It will then address the nature and prevalence of bias within knowledge organisation systems (KOS) and the ethical implications thereof for information professionals.

2.1 Methodology

The research methodology used for this dissertation was an extended literature review. Other methods had been considered, such as conducting a qualitative study of cataloguers and classificationists to gauge their thoughts and feelings on the issue of bias within knowledge organisation systems, and how they deal with these issues in their professional practice. However, since this would not allow for consideration of KOS from a user perspective, it was felt that this research approach would not give a balanced view of the topic. It was felt that a desk-based literature review would be most appropriate as it would give the greatest scope for fully exploring the topic and answering the research questions.

In order to find key texts that deal with the issue of bias in knowledge organisation systems, the strategy was to search for texts on databases and mine the citations for other relevant sources (Connaway and Radford, 2017). Since this research project was time-limited, it was decided that a limit would be placed on the time period for gathering literature and searching would continue until all the key literature was identified, and then until either concept saturation or the time limit was reached.

Sources were selected for inclusion if they addressed the ethical implications of cataloguing, classification or indexing. Some sources such as CannCasciato (2011), Banush and LeBlanc (2007), Miska (2012) Were rejected because they dealt more generally with the subject of

catalogues and knowledge organisation systems. Others such as Collins (2018), were rejected because they were concerned with the subject of ethics in the LIS field but did not focus specifically or only superficially on the particular ethical implications of cataloguing and subject access.

The search strategy for this literature review was first conducting a preliminary search of the University of Strathclyde SUPrimo catalogue using keywords 'bias' and 'cataloguing'. From this initial search some key documents were identified. After initial analysis of the key texts, keywords were identified, and further searching was conducted in LISA and LISTA databases using the following search:

bias AND (knowledge organi*ation) AND (catalog* OR classification OR indexing) AND marginali* AND ethic*

Once several more relevant sourced had been identified, citations were chained forwards and backwards to identify more relevant source material until concept saturation was reached (Connaway and Radford, 2017). Sources were then analysed and compared using the software Nvivo. While the main body of the research literature was comprised of LIS specific literature, it was also felt necessary to research widely across other subject disciplines such as philosophy and psychology in order to understand the complex causes of bias and to understand the theory used for analysis of the key literature (Hart, 2018).

2.2 Implicit Bias

On the 29th of May, 2018, Starbucks closed 8,000 of its coffee shops across the United States in order for 175,000 of its staff to take implicit bias awareness training after Rashon Nelson and Donte Robinson, both African American, were arrested at a Starbucks in Philadelphia the previous month. The manager of the Starbucks coffee shop called the police to report the men for trespassing when, arriving early for a business meeting, they asked to use the bathrooms without having purchased anything (Seigel, 2018a). The executive chairman of Starbucks, Howard Schultz, noted that the employee had demonstrated unconscious bias which may have amounted to racial profiling. (Seigel, 2018b). Clearly, implicit bias such as that shown by the Starbucks manager can be insidious in its nature and damaging in its consequences.

Explicit biases are conscious and deliberate attitudes and behaviours that favour certain groups or concepts and disfavour others, with the intention of harming or excluding them, such as overt racism or preferring certain ethnic groups over others (Sukhera, 2018). Psychologists have generally claimed that the difference between explicit and implicit attitudes, often described as ‘associations’ (Brownstein, 2017, p10), is that we are aware and conscious of our explicit attitudes, but not of our implicit attitudes, which are unconscious and beyond the reach of our introspection (Madva, 2017; Berger, 2018).

Psychologists have proposed several interpretations of implicit bias. Gendler (2008) describes the automatic, arational, clusters of feelings and behaviours experienced by an implicitly biased person as ‘aliefs’. They may be at odds with the persons stated beliefs, for example that they have no preference for white or black people, but when they see a black person, they react with aliefs such as: ‘black man! Scary! Avoid!’ (Brownstein, 2017, p11). Another interpretation claims that implicit bias can be understood as cognitive ‘schemas’, where we unconsciously associate a series of attributes to a term in order to socially categorise. This theory implies that implicit bias does not necessarily stem from an aversion to certain social groups (Brownstein, 2017, p.15).

Implicit biases exist separately from and can even be diametrically opposed to our explicit attitudes (Machery, Faucher and Kelly, 2010). For example, those who sincerely believe themselves to reject racial prejudices and stereotypes can simultaneously and unknowingly harbour implicit biases against certain groups. This can unwittingly affect their behaviour towards those groups in negative ways, despite their efforts to the contrary (Madva, 2007).

2.2.1 Revealing implicit bias

The implicit association test (IAT) is the most common method used by psychologists to research implicit bias. IATs are used to measure peoples’ attitudes without having to rely on their verbal reports, and without the participant being aware of what is being measured (Machery, Faucher, and Kelly, 2010; Brownstein, 2017). They are often used to test attitudes towards age, race, gender, sexual orientation etc. The participant is required to sort words or pictures into categories as quickly and accurately as possible. Participants tend to react more slowly and make more errors when sorting concepts that are consistent with common stereotypes, thus revealing the subjects’ implicit attitudes towards certain groups (Brownstein, 2017). The subjects’ implicit attitudes revealed by IATs typically do not correlate with evidence

of the subjects' explicit attitudes. This means that people are able to articulate their own perception of their attitudes and beliefs, but they are not able to articulate their implicit attitudes, and their explicit and implicit attitudes often differ. This also indicates that people are aware of their explicit attitudes but not their implicit ones (Machery, Faucher, and Kelly, 2010).

People who exhibit such a discordance between their stated beliefs and their behaviour can often be 'aversive racists' (Brownstein and Madva, 2012 p.69). They may claim to welcome racial equality, but their actions and behaviours demonstrate implicit prejudice. This belief-behaviour paradigm may explain how racial inequality can still exist in countries such as the USA despite most US citizens' sincere belief that they are not racist, and ignorance of the fact that they are demonstrating discriminatory micro-behaviours (Brownstein and Madva, 2012).

Brownstein and Madva (2012) identify one cause of aversive racism as 'repeated exposure to biased representations of social groups' (Brownstein and Madva, 2012 p.70). According to Payne, Vuletich and Lundberg (2017), the more frequently people are exposed to biased or stereotypical representations of social groups, the more likely they are to recall these stereotypical attributes when thinking of that social group. Many of the examples given above have involved implicit racial bias, but implicit bias can also encompass gender, sexual orientation, class, age, ability, etc (Holroyd, Scaife, and Stafford, 2017), with similar implications for the LIS profession, as information professionals are responsible for deciding how knowledge is represented (Olson, 2001). When information professionals represent knowledge in a biased way, not only are they directly marginalising certain social groups, but they are also perpetuating the systemic bias faced by marginalised people by furthering the implicit biases of society at large.

Implicit bias has been discovered within the criminal justice system, with juries more likely to find black defendants guilty compared to white defendants when presented with the same evidence (Brownstein and Madva, 2012). It has also been shown to affect how hiring decisions are made, with employers more likely to hire people with 'white sounding' names (Bertrand and Mullainathan, 2003). Ominously, it also exist in health care, negatively affecting patients belonging to marginalised groups, such as Green's (2007) study in which white doctors who explicitly denied having a racial preference were found to be more likely to diagnose coronary artery disease and to prescribe thrombolysis for white patients, compared to patients who were

black and presented with the same symptoms and ECG results (Brownstein, 2017; Sukhera, 2018).

Bias exists on an individualistic scale, it is likely that we are all influenced to some extent by implicit biases, as we each have our own particular attitudes and world view (Holroyd, Scaife and Stafford, 2017). However, bias can also occur at a broader institutional or social level (Machery, Faucher, and Kelly, 2010; Sarine, 2012). Sarine (2012) argues that an individual's bias can contribute to bias on an institutional or systemic level, when they make decisions that influence the 'scripts' or 'paths' of other organisational actors, and shape the organisational culture. Payne, Vuletich and Lundberg (2017), state that to only look at individual bias is reductionist, as it does not account for the historical and cultural basis for such bias, and Machery, Faucher, and Kelly (2010) add that discrimination can be explained by policies and institutions that support inequality by favouring powerful or normative social groups over marginalised ones, rather than just by looking at the actions of implicitly biased individuals.

2.2.2 Responsibility for implicit bias

Are we responsible for our implicit biases? According to Washington and Kelly (2016), given the current state of the art of psychological research into implicit bias, we are now morally responsible for our behaviour resulting from implicit bias, in a way that we would not have been thirty years ago, when comparatively little was understood about bias. Saul (2013), on the other hand, argues that a person shouldn't be held responsible for their implicit biases since they are unaware of them and they are simply the result of belonging to a fundamentally biased and discriminatory society.

This point of view maintains that we cannot be judged for our implicit biases, but Holroyd, Scaife and Stafford (2017) argue that whether we can be held responsible for the behaviours and actions resulting from those biases is a separate question. Since individuals are not consciously aware or in control of their implicit biases, it would be unfair to punish them for actions resulting from them. However, individuals harmed by discrimination resulting from implicit biases are entitled to seek redress for the harm done to them (Holroyd, Scaife and Stafford, 2017). Additionally, Faucher (2016) points out that it is not relevant to the victim of the discrimination whether it was consciously done or not, the result to the victim is still the same. Holroyd, Scaife and Stafford (2017) claim that rather than seeking to blame or punish

perpetrators of unconscious discrimination, we have ‘forward-looking obligations’ to address problems caused by our unconscious biases (p.4).

Since the cause of implicit bias in individuals is structural, institutions should address the structural causes of bias, rather than solely addressing the issue on an individual level (Madva, 2007; Holroyd, Scaife and Stafford, 2017). However, they also admit that the solution is more complex than simply seeing the issue as an individualistic or collective one since ‘institutional change requires individual buy-in and motivation to instigate change’ (Holroyd, Scaife and Stafford, 2017, p.10). Rather than solely focussing on individuals, such as by providing implicit bias awareness training, institutions should also recognise that the individuals within their institution may have many and various implicit biases, and endeavour to ensure that their institutional procedures can withstand such biases. Holroyd, Scaife and Stafford (2017) also suggest that institutions should go further to ‘address whatever mechanisms are producing discriminatory outcomes’ (p.10).

Berger (2018) argues that until people become aware of the discord between their implicit and explicit attitudes, they cannot compensate for the effects of their biases. Implicit bias training such as that carried out by Starbucks staff has been shown to have limited efficacy. Individuals functioning within biased situations who have undertaken implicit bias training tend to return to their baseline levels of bias within a few weeks (Payne, Vuletich and Lundberg, 2017). Given these findings, the LIS profession should consider looking inwards to examine its own implicit biases at institutional and systems levels as well as at an individual level, and attempt to counteract them for the benefit of the diverse public they serve.

The following sections of this literature review will investigate the effects of cataloguers’ implicit biases on Knowledge and Organisation Systems and the implications for the LIS profession.

2.3 Why classification matters

A common perception of classification systems is that they are ‘arbitrary, meaningless complex, old-fashioned, [and] not especially relevant’ (Feinberg, 2011, as cited in Bullard, 2017, p. 77). However, this is far from the case. According to Bowker and Star: ‘to classify is human’ (Bowker and Star, 2000, p. 1). Classification is something that we do consciously and unconsciously every

day, and we are surrounded by classification systems. To those whose viewpoints align with dominant groups they are invisible, but our classification systems lend authority to the ideologies of dominant groups and discriminate against and oppress those who do not fall within the mainstream (Rosenfeld and Morville, 2002).

Bias has existed in knowledge organisation systems since they were conceived of. Our knowledge organisation systems appear to be unbiased, the early pioneers of classification such as Dewey, Bliss and Ranganathan believed they could create systems that would reflect the universe of knowledge (Mai, 2013). This created the illusion that these systems were universally applicable and unbiased (Olson 2001; Mai 2013). According to Mai, the original creators of classification systems assumed that 'the universe of knowledge exists independently of human perception and specific cultures, and that it is accessible to humans' (Mai, 2013, p.243). However, KOS are human constructions that do not exist outwith human perception and culture, and some would argue that by their nature they are deeply flawed (Mai, 2013; Barbara Fister in *The Kitchen Sisters Present*, 2019).

Olson (2002) states that the legacies of the early pioneers of classification, as well as their particular biases, live on in the cataloguing systems we use today.

Their presumptions are our patrimony - the genetic code passed on in their seminal works.

(Olson, 2002, p141)

2.4 Bias within Dewey Decimal Classification

Melvil Dewey published the Dewey Decimal Classification System (DDC) in 1876. He created his classification scheme by separating the entire world of knowledge as he saw it into ten classes, each of which was further separated into ten hierarchical divisions (Dewey Decimal Classification n.d.). According to Olson (2001), the hierarchical nature of the structure created a system of bias. 'The violent imposition of a structure like the laying of the railroad across the West, brings prosperity to those included but not to those excluded' (Olson, 2001, p.650-651). Olson (2002) describes how the cultural, social and geographical context in which Dewey's classification system was created and which Dewey endorsed is that of 'Anglo-Saxonism,' Therefore, Anglo-Saxon viewpoints are privileged, and 'other' viewpoints such as 'non-Christian

religions, non-European languages, and regions and countries with the least geopolitical influence' tend to be marginalised (Olson, 2002, p29). Spelman (1988) describes the privileging nature of the hierarchical structure in the DDC by comparing it to a customs hall:

Imagine a huge customs hall with numerous doors, marked 'women,' 'men,' 'Afro-American,' 'Asian-American,' 'Euro-American,' 'Hispanic-American,' 'working class,' 'middle class,' 'upper class,' 'lesbian,' 'gay,' 'heterosexual,' and so forth The doors are arranged in banks, so that each person faces a first bank of doors that sort according to gender, then a bank that sort according to race, or alternatively sort first according to race, then according to class, then according to gender, and so on.

(Spelman, 1988, as cited in Olson, 2002, p173-174)

The hierarchical and privileging structure of the DDC has resulted in a system where groups at the top of the hierarchy are gathered together but groups further down in the hierarchy end up being dispersed (Olson, 2001, p.654-655), which affects the discoverability for topics outside of the mainstream.

2.5 Bias within Library of Congress Subject Headings and Classification

Similar issues of bias exist in the Library of Congress classification (LCC) and the Library of Congress Subject Headings (LCSH), the only subject heading list which has been accepted as a worldwide standard (Library of Congress Subject Headings, n.d.). The LCSH was created and is maintained by the US Library of Congress, and was based on a classification scheme devised by Charles Ammi Cutter in 1880. According to Olson, Cutter believed that the catalogue should be constructed for the convenience of the public it serves, which on the face of it seems a worthy goal. However, he viewed 'the public' as a homogeneous group with a 'unified perspective and a single way of seeking information' (Olson, 2001, p.642). This creates a system where representation is based on the interests and needs of the majority. Olson claims that this perspective is problematic, as a singular view of 'the public' excludes those who are outwith the mainstream and results in the majority opinion being imposed on minorities, with certain terms being privileged over others (Olson, 2001).

Olson describes LCSH as being patriarchal in its use of male-as-normative terminology (Olson, 2002). There are numerous instances of subject headings where gender-biased assumptions are present. For example: there is a subject heading for 'contraception' and a subject heading for 'male contraception'. The implication is that contraception is the responsibility of females, with male contraception as an exception to the norm (Olson, 2002; Ferris, 2008). Other similar examples are 'astronauts' and 'women astronauts' or 'chemists' and 'women chemists' (Library of Congress Subject Headings n.d.).

As well as LCSH, LCC has come under criticism. Where multiple subject headings can be used to give multiple interpretations to an item's subject matter, a classmark provides only one definitive interpretation (Higgins, 2012).

2.6 Systemic Bias

The terms 'institutional bias' and 'systemic bias' are often used interchangeably (Chandler, D., and Munday, R., 2019). Payne (2017, p.238) defines institutional racism as the policies and norms within institutions such as legal or educational systems and mass media, which privilege powerful racial groups, whereas systemic discrimination is a broader concept relating to how hierarchies favouring certain social groups over others have been ingrained in history and culture and are widespread through different aspects of society. According to Payne (2017), in a biased system, minorities will be systematically disadvantaged whether or not the actors within the system are implicitly biased.

Systemic bias is not only a contributing factor to implicit bias: 'Where else but a biased culture would we learn biased associations?' but it is also the *result* of implicit bias, the aggregate of prejudice and bias from many sources throughout society over a long period of time, creating a self-perpetuating cycle (Payne, 2017, p.238).

This dissertation will use the term 'systemic bias' to describe the bias occurring within KOS, as the discussion centres on a human system, and will take a systems-based perspective. The use of 'systemic bias' also acknowledges that the effects of bias within KOS can be widespread and are not limited to a particular domain.

The biases present in KOS do not simply derive from the antiquated worldview of their original creators. KOS can be considered to contain systemic biases as they are integral to the nature

of the KOS and the act of classification, and do not simply result from the implicit biases of those who build and maintain them. For example, Olson (2001) argues that the linear structure of classification, whether in terms of books arranged in order on a shelf for users to browse, or within a database, does not allow for all the facets of a document to be represented. It can then be represented only in the way that best suits the purposes of the dominant majority. Smiraglia (2009) agrees with this viewpoint, suggesting that biased representation occurs when resources are described in ways that do not reflect the diverse ways in which a resource can be used and understood.

Mai (2013) would argue that bias within classification schemes is not problematic in itself, it is a fundamental and unavoidable fact of classifications (Mai, 2013 p.244). It simply means that they are expressing a view on the subject matter and that naturally entails some subjects being privileged over others within the scheme. He argues that this becomes a problem when users look to the classification as an authority on the relationship between different subjects, which presents an ethical problem for controversial issues.

Guimarães takes a similar position. He refers to the biases within KOS as 'slants': Each KOS has its own worldview containing beliefs and assumptions. He says that all KOS contain slants as they occur in a particular place and time and are the product of a cultural paradigm. Guimarães does not find slants to be problematic, but he believes that slants must be recognised for diverse communities to communicate with each other through global information systems. He finds that slants only become problematic when they contain prejudice or proselytism, two dangerous types of bias which can justify segregation or harm (Guimarães, 2017).

According to Mai, 'classifications reflect reality. Reality is biased, unjust, and full of contradictions' (Mai, 2013, p.242). Classifications can cause harm to those that belong to marginalised or minority groups (Bair, 2005), as according to Harding, people belonging to minority groups often have perspectives that conflict with the dominant ideology due to the effects of sexism, the class system, imperialism and institutional racism (Harding, 1992, p. 572). As Olson (2001) has discussed, classifications systems can hinder access to non-mainstream topics, but Fox and Reece (2012) also discuss the notion of conceptual violence resulting from classification systems:

conceptual violence consists of harm through linguistic or structural misrepresentation and can occur, for example, when topics in a knowledge organization system ... are assigned derogatory language or subordinate structure.

(Fox and Reece, 2012, p.377).

Spiteri (2012) suggests that it is not possible to provide unbiased catalogue records in practice, as they are inherently biased. Mai (2013) argues that minimising the harm done by classification systems by providing tools to access collections is the challenge for information professionals.

2.7 Warrant

The LCC is a scheme that is built on the principle of literary warrant. Mai describes literary warrant as a 'document-centred approach' (Mai, 2005, p. 600) That is, the divisions within the classification system describe the physical collection, rather than a scientific attempt to represent the world of knowledge.

To build a system according to literary warrant is to recreate the collection as a classification system; the finished system should present a compressed version of the collection as a whole, no more and no less.

(Bullard, 2017, p. 78)

This approach is problematic, because when a document-centred approach is taken, the dominant culture prevails. Privileged insiders are represented, and outsiders or materials on non-mainstream concepts are marginalised.

Olson (2001) claims that likewise, the LCSH is built on literary warrant. The terminology used within the subject headings is derived from the language of published authors. So, if that collection was originally intended for a readership that was identified as Anglo-Saxon, white, Christian, male and heterosexual (Ferris, 2008) then that is the language that is reflected in the catalogue (Lee, 2015). Feinberg (2007) argues that outsiders such as women, people of colour, or people belonging to the working classes are not accommodated within the classification because 'the fact of their existence is not acknowledged' (Feinberg, 2007, p.4).

Beghtol (2002) describes the concept of user warrant. This is where the design of a classification system, and the language used within it is influenced either directly or indirectly by its users. Although Ranganathan's five laws of library science instruct librarians to consider the needs and convenience of their users, allowing users to collaborate on KOS can be problematic (Ranganathan, 1931). Bullard (2017) states that responding to user need in the design and use of KOS is not possible, as there is no such thing as a single 'user need' within a diverse community of users. Hjørland (2013) adds that user warrant creates flawed and limited systems as they are based on the users' flawed and limited understanding of subject matter. This could result in what Olson describes as a 'tyranny of the majority' (Olson, 2002, p.140). Bullard (2017) recommends that systems designers take a user-centred rather than a user-warranted approach to KOS design in order to produce systems that respect all users rather than the dominant majority.

2.8 Ethical implications for information professionals

According to Ferguson, Thornley and Gibb (2016), ethics in the field of library and information science is complex and multi-faceted. Indeed, Bair (2005) suggests that there has been very little research into the ethics of cataloguing.

Elizabeth Buchanan defines professionals as 'experts in a field which provides them an advantage over the lay person and [whose] work has the potential to impact-either positively or negatively-the general public at large' (Buchanan, 2004, p.620). According to Bair (2005), cataloguers are professionals that have particular ethical responsibilities. The special skills they possess and the powerful areas of access and naming for which they are responsible, gives cataloguers the power to either help or harm the people they serve. According to Ferris (2008), information professionals have a strong sense of professional ethics.

Information professionals are aware of the privileged position they hold as 'gatekeepers of information' and do not take their responsibility to provide accurate, fair and unbiased information lightly (Bair, 2005, p.22). Others would argue however, that although LIS professionals are keen to do the 'right thing' and have a strong sense of professional integrity, they are not always able to ascertain the ethical implications of situations, and to determine the right courses of action (Ferris, 2008; Ferguson, Thornley and Gibb, 2016). Mai suggests that information professionals should use 'solid conceptual frameworks' as a basis for their

professional decision making (Mai, 2013, p.247). The difficulty is that although there are several professional codes and ethical frameworks for national and international library and information professional associations, such as CILIP, ALA, and IFLA, their guidelines can often be rather vague, aspirational and open to interpretation. Moreover, they are generally aimed at all areas of librarianship and so do not address the specific ethical issues that cataloguers face (Bair, 2005).

The Chartered Institute of Library & Information Professionals (CILIP) professional code (2004, n.p.), states that information professionals should ‘Avoid inappropriate bias or value judgements’, ‘Deal fairly with the competing needs of information users’ and ‘Consider the public good, both in general and as it refers to particular vulnerable groups’. The more recent ethical framework devised by CILIP (2018) states that information professionals must commit to uphold, promote and defend:

Human rights, equalities and diversity, and the equitable treatment of users and colleagues; the public benefit and the advancement of the wider good of our profession to society; impartiality and the avoidance of inappropriate bias.

(CILIP, 2018)

When cataloguers are faced with ethical dilemmas, they may turn to their professional code of ethics. If their professional code advises them to ‘stay neutral and do the right thing,’ it doesn’t offer much practical advice and cataloguers are left with no choice but to use their own judgment (Mai, 2013, p.252). There is as yet no specific ethical guidelines for cataloguers. Cataloguers have recognised a need for a more specific code due to their work’s specialised nature and their particular responsibilities to provide equitable and unbiased access and discoverability to resources (Daniels, 2018).

2.9 The role of Information Professionals

Academics in the LIS field have proposed numerous lofty ideals embedded in the role of information professionals in general and cataloguers more specifically. They see bibliographic control as central to the role of the information professional, in order to accurately describe and provide equitable access to information (Hill, 2004; Bair, 2005; Hoffman, 2009). According to Lee (2015), cataloguing and bibliographic control is essentially making a series of decisions:

selecting categories and characteristics. Cataloguers make such decisions cautiously and endeavour to make classifications that are neutral and free from bias.

Leckie, Given and Buschman (2010), describe the field of LIS as being concerned with the betterment of society as a whole, through the provision of equitable access to information to all, and other proactive practices (to Leckie, Given and Buschman, 2010, p.xiii). Gibson, *et al.* (2017), claim that LIS professionals have a moral duty to address the needs of diverse communities, while Bair (2005), states that cataloguers have an obligation to provide contributive justice:

Catalogers should actively participate in the development, reform, and fair application of cataloging rules, standards, and classifications, as well as information-storage and retrieval systems. They should also be aware of how their activities add value to information packages and provide or deny access to, or “findability” of information, and why these activities are vital to a free society.

(Bair, 2005, p. 16)

This indicates that information professionals have a duty to design KOS that meet these ethical principles (Beghtol, 2002). However, Bullard (2017) would argue that it is difficult to ascertain the extent of the agency that information professionals have in influencing the cultural and social impact of the KOS they design and maintain. Mai (2013) states that information professionals have a responsibility to help users access the vast amounts of information available to us and to navigate the complexities of our society. They also have a duty to ‘expose the different assumptions and perspectives on the world and on society’ (Mai, 2013, p.251-252).

How are information professionals to achieve this when they often unconsciously contribute to and perpetuate these ‘assumptions and perspectives’ through the biases contained in the systems they create?

2.10 Local vs global users

Classification schemes like LCC and DDC, once intended for a local user group are increasingly reaching a global user-ship, with the potential for great influence on a world scale, and also the potential to cause harm (Bair, 2005). The DDC is now the most widely used classification

scheme in the world and is being used in more than 135 countries (Olson, 2002). The LCC is increasingly popular with academic institutions worldwide, for reasons of economics and convenience (Higgins, 2012). These schemes are the product of a specific place and time, and when they are taken up by other countries, they bring with them their inbuilt assumptions and cultural biases (Lee, 2015). The increasing global influence of the LCC has been described as ‘cultural imperialism’ (Higgins, 2012, p.249). The LCC was designed to shelve the holdings of the US Library of Congress. It was never intended to meet the needs of a global community, and it is unsurprising that it has an American-centric viewpoint (Higgins, 2012). However, Bair (2005) states that since classification schemes containing systemic bias are being used by different cultures worldwide, information professionals have an ethical responsibility to acknowledge the existence of these biases. Cataloguers must recognise their moral obligations not just to their local user group, but also to a global user group.

As we name information for individual libraries, we also name it for the whole world.

(Olson, 1998 as cited in Bair, 2005, p.16)

2.11 Universality

Universality is the notion that a system is universally applicable regardless of the context it is applied in. Early classificationists such as S. R. Ranganathan and Henry Bliss, believed that it was possible and desirable to construct systems in so objective a way that the systems designers would be able to find a ‘correct’ way to organise documents that would reflect an actual external order of meaning (Feinberg, 2007; Bullard, 2017). More recently, Drabinski (2013) has claimed that radical librarians who attempt to push for corrections to problematic language and cataloguing choices are also trying to achieve universally applicable subject description, an attempt which is both impossible due to the unfixed nature of meaning, and problematic in itself, as it masks the underlying issues of bias within the systems themselves and the everyday decision-making processes of cataloguers.

According to Feinberg, it is misguided to attempt to create a universal KOS, rather, information professionals should analyse and interpret the ways that different groups or cultures interpret information (Feinberg, 2007). Lee (2015) claims that universal classification is a myth.

Mai (2013) argues that there are several advantages to the idea of universal classification such as the ease of interoperability between libraries and the increased ability to extend operations. However, Mai also outlines several drawbacks to universality: the lack of room for interpretation, lack of user-centredness, or allowance for cultural difference. These criticisms chime with critical theoretical analysis. Mai further takes a poststructuralist approach to challenge the very concept of universality of knowledge, claiming that there are multiple universes of knowledge, as people always understand things differently based on their particular viewpoint and way of understanding the world.

This notion of a universality of knowledge is closely related to the concept of essentialism, whereby the true subject of a document is inherent, independent of context, and need only be revealed by objective consideration (Feinberg, 2007). Critical theory, however, does not give credence to the idea of universality. Critical theorists such as Derrida and Foucault subscribe to a notion of plurality of meaning rather than essentialism. Meaning, according to critical theorists, is not inherent within a document but constructed and contingent on context. It is also mutable, and changes over time.

Olson (2001) argues that subject description using controlled vocabularies has created a system based on a universality/diversity binary opposition. The universal is automatically assumed to be 'white, ethnically European, bourgeois, Christian, heterosexual, able bodied [and] male.' According to Olson, all else is a deviation from the universal and is systematically excluded from knowledge organisation (Olson, 2001 p.4; Deodato, 2010).

Derrida found that such biases result from the way that language and meaning shift and change through the movement of time and are inescapable. There is no true, lasting meaning from which description can be derived, understanding of language is always an act of interpretation that can differ at any point in time (Deodato, 2010).

2.12 Summary

The literature shows us that bias is a complex phenomenon which is widespread in society and far-reaching in its impact. It is both intrinsic to the systems we use and comes as a result of the actions and decisions carried out by implicitly biased individuals.

In LIS, when contemplating bias in knowledge organisation systems, scholars have tended to analyse the systems rather than the systems' creators and maintainers, and offered solutions to correct the biases in those systems. The potential for harm caused by implicit bias is clear. Either overtly as in the Starbucks case, or more subtly through marginalisations and micro-aggressions. The research into implicit bias also shows how implicit bias can contribute to biased systems, and how biased KOS can marginalise and exclude those who do not belong to the dominant social groups.

The literature indicates the implications for access to information caused by implicit bias, and why this is an important ethical issue for LIS, since biased subject representation and classification will affect users' ability to access information, which signifies that information professionals have an onus of responsibility for their biases, in order to provide equal access to information to all.

Missing from the body of literature on biased knowledge organisation systems is an acknowledgement of the role of implicit bias in the creation of biased KOS. In the LIS literature reviewed, there seems to be a lack of consideration for how systemic and institutional bias occurs. There is no consideration for the psychological mechanisms of implicit bias that produce and perpetuate biased systems. Bias is regularly referred to, but is never adequately investigated or defined within the LIS literature. Within the literature, several suggestions are made to address bias within KOS. However, as yet there has been no comprehensive evaluation of the various proposed solutions to address biased systems.

The following section will introduce critical theory and justify its use to critique the proposals for combatting bias within KOS.

3.0 Critical theory

The following section introduces critical theory, its origins and more recent conceptions, and will explain how it has been applied in LIS texts concerning bias and representation in knowledge organisation systems. It will then introduce the concept of praxis as a practical application of critical theory.

3.1 Introduction- what is critical theory?

Many LIS researchers have looked at bias within KOS by conducting analyses using a critical theoretical approach. Critical theory is an umbrella term that spans a set of related theories such as Feminism, Race theory, Queer theory, Postcolonialism, etc., that are concerned with critiquing ‘social structures, norms and inequalities’ (Winkel-Wagner, Lee-Johnson and Gaskew, 2019, p.3). Critical theory is an analytical tool that can uncover ‘irrational societal contradictions’ within ideologies purporting to be rational, that allow social groups to dominate and subordinate each other (Leckie, Given and Buschman, 2010, p.x). Critical theories ask questions such as “who is privileged and who is marginalised?” “Whose voice is heard and whose is silenced?” Many critical theories can be seen as liberationist and transformative: they critique social structures with a view to identify oppression and consider ways to effect social change through action or revolution (Leckie, Given and Buschman, 2010; Agyepong, 2019; Winkel-Wagner, Lee-Johnson and Gaskew, 2019).

Critical theory is generally considered to have evolved from the work of Karl Marx. Marx’s theories were grounded in critique of the social and economic conditions of the late 18th and 19th Centuries. He described how the ruling elite or *Bourgeoisie* had power and social privilege over the *Proletariat*, controlling production, social systems and ideology. In this capitalist system, the Proletariat provide their labour but are removed from the end-product as they are merely a small part of a ‘large industrial complex’ (Olson and Fox, 2010, p.299). Marx declared that these two social groups would be in perpetual conflict until the Proletariat united and revolted to emancipate themselves from their oppressed status. Marx’s theories analysed the power imbalance between the ruling classes and the exploited, and aimed to effect change by empowering the Proletariat (Winkel-Wagner, Lee-Johnson and Gaskew, 2019).

Critical theory has its foundation in the Marxist tradition, and has attempted to adapt and extend Marxist theories to a social and political world that is profoundly different from the one in which Marx’s theories were conceived (Leckie, Given and Buschman, 2010, p.x). Critical theory is associated with scholars belonging to the Frankfurt School of the Institute for Social Research, formed in 1923 and particularly active during the 1930s, also known as the first-generation of critical theory (Winkel-Wagner, Lee-Johnson and Gaskew, 2019). Prominent members of the Frankfurt School were Theodor Adorno, Walter Benjamin, Herbert Marcuse and Max Horkheimer. They applied a neo-Marxist analysis to socio-political and socioeconomic

formations, and existing social theories. (Leckie, Given and Buschman, 2010, p.ix). There was also a group of French scholars active contemporaneously, including Jacques Derrida and Michel Foucault, who worked in the critical tradition but did not align with the Frankfurt School and rejected their Marxian roots (Leckie, Given and Buschman, 2010, p.viii). Jürgen Habermas was a theorist belonging to the Frankfurt School's second wave of critical theory in the 1950s. He advocated a more normative version of critical theory that centred on *praxis* (informed ethical practice), using theory in order to advance society towards equality and liberation (Reider and Eryaman, 2010, p.90). Many modern or second-generation critical theories based on race, class, gender, ability etc., have their roots in Habermasian theory (Winkel-Wagner, Lee-Johnson and Gaskew, 2019). They can be considered critical in a broader sense than the theories developed by the Frankfurt School, and place a greater emphasis on social change and action or “praxis” than the first-generation (Winkel-Wagner, Lee-Johnson and Gaskew, 2019). However, they are grounded in the Frankfurt school's philosophical approach and share similar practical aims of reducing domination and increasing freedoms (Bohman, 2016).

3.2 Poststructuralism and Deconstruction

Poststructuralism is the highly influential philosophical movement established by scholars such as Roland Barthes, Michel Foucault and Jacques Derrida. Poststructuralism claims that there is no such thing as absolute truth, and therefore meaning is unstable, ambiguous and pluralistic. Deconstruction is a concept related to Poststructuralism and commonly associated with Derrida. In this method of critical analysis, the binary oppositions within a text are identified, then the hierarchical relationships which establish one binary in the pair as central and the other as marginal, are reversed. The purpose is to reveal what Derrida refers to as the ‘Other,’ by focusing on what has been pushed aside in the binary conflict (Olson and Fox, 2010). This process demonstrates that the original hierarchical relationship was constructed, and through this process of deconstruction, meaning is not destroyed, but is reassembled in a new interpretation. Through deconstruction we can see that both readings of the text (as well as others) are equally conceivable (Deodado, 2010). Derrida's work shows us that since meaning is fluid, any attempts to represent it as something stable and fixed are ‘acts of exclusionary “violence”’ (Deodado, 2010, p.76).

Derrida's concept of the ‘Other’ is key to critical theory. According to Deodado (2010), metaphysicians have depended on binary oppositions: the centring or prioritising of one concept

over another, e.g., ‘good’ over ‘evil,’ and in doing so creating a hierarchy of concepts. ‘Good’ is the primary or centre, while ‘evil’ is defined by the absence of ‘good.’ The result is the privileging of one equal concept over its binary opposite. Derrida, on the other hand, believed that terms do not exist in and of themselves, but only in relation to what they are not, ‘it’s difference from something else’ (Deodado, 2010, p.79). According to Derrida, concepts that are not in the centre of the binary opposition will necessarily be excluded, repressed or marginalised and he refers to these concepts as the “Other” (Deodado, 2010). The concept of the repressed and marginalised Other has made Derrida’s deconstruction a useful tool for analysis through the prisms of race, gender, class, sexuality and so on.

3.3 Critical theoretical frameworks

Some of the major contemporary or ‘second-generation’ critical theories include (among others) postcolonial theory, feminism, critical race theory and queer theory (Winkel-Wagner, Gaskew, and Lee-Johnson, p.7). These theories will be discussed further in the following chapters of this dissertation. These theoretical approaches share similarities in that they all involve critique of the hegemonic structures and systems that result in marginalisation, oppression and under-representation of social groups based on race, gender, sexual orientation, class, nationality, ability, etc., and interrogating and interrupting power and oppression to give voice to those who are oppressed to create a more just society (Agyepong, 2019; Winkel-Wagner, Sulé, and Maramba, 2019).

Critical race theory (CRT) emerged in America as a result of the Civil Rights Movement. Although there are many varying definitions of critical race theory, broadly speaking, CRT encourages consideration of the ways that oppression along racial lines occurs in society (Furner, 2007; Winkel-Wagner, Sulé, and Maramba, 2019). Postcolonial theory is a critical theory based on an analysis of colonialism and imperialism, which was developed by scholars from nations which had previously been colonised. Postcolonial theory analyses the relationship between the coloniser and the colonised, and is particularly concerned with examining the ‘psychological, economic, social, political, and cultural experiences of the colonized from the onset of colonisation to the present day’ (Agyepong, 2019, p.179). CRT and Postcolonialism share many roots in Fanonian theory. In the 1960s, Frantz Fanon produced his seminal works on the impact of colonisation, both psychologically and socially, on the colonised. Fanon’s work can be viewed

in the context of colonisation but also from the perspective of race, as the coloniser can be taken to be White, while the colonised is assumed to be Black (Forbes, 2019).

Feminism is rooted in classical Marxism, as it critiques imbalanced power structures, although through the lens of gender power imbalances, rather than looking at society through the bourgeoisie and proletariat/subaltern opposition, and aims to empower the subaltern to effect social change (Rhode, 1990; Olson and Fox, 2010). Feminist critical theories make gender the focus of their analysis by identifying and critiquing practices that have 'excluded, undervalued or undermined women's concerns' (Rhodes, 1990, p.619). They take a practical approach to promoting gender equality, as feminism maintains that gender equality is not possible under the prevailing ideological and institutional structures (Rhodes, 1990).

Modern scholars working in the critical theoretical tradition such as Gayatri Chakravorty Spivak have combined the Derridean critical textual analysis approach of deconstruction with ethico-political movements such as feminism and postcolonialism that demand action (Olson and Fox, 2010). Other critical theoretical frameworks draw from the works of poststructuralists scholars such as Foucault and Habermas. Queer theory, for example, can clearly be seen to have its roots in a poststructuralist understanding of knowledge as something fluid, changing and unstable when Drabinski describes it thus:

Queer theory found roots in a postmodernism that challenged the idea that truth could be final. For queer theory, knowledge - both of the self and about the world - is understood to be discursively produced, socially powerful, and always already undergoing revision. Queer theory resists the idea that stable identities like lesbian or gay exist outside of time. Rather, these identities exist only temporarily in social and political contexts that both produce and require them.

(Drabinski, 2013, p.101)

Queer also relies on normative categories for existence. The construction of categories necessarily produced an 'other' category of concepts that deviate or are outside of the norm. Queer identities are grounded in 'otherness,' reliant on normative sexual identities for their existence (Drabinski, 2013).

What these contemporary critical theories have in common, and what makes them relevant to LIS and to critique of classification systems in this instance, is that they all challenge the existing distributions of power.

3.4 Critical theory in LIS

LIS has historically contributed to the construction of systemic bias. The concepts of literary warrant and classification have created a reality where those writing about race (a socially constructed concept, rather than discrete biological categories) have constructed domains of knowledge which has warranted the taxonomic subclassification of the human species along 'racial' lines and presented it as fact, allowed race to be 'understood as a biological, or natural, categorization system of the human species.' This was then used to 'justify and prescribe exploitation, domination, and violence against peoples racialized as nonwhite' (Clare and Denis, 2015 p.857). Thus, it could be argued that literary warrant and bibliographic classification have a part to play in establishing the social construction of race, and the resulting widespread systematic discrimination. Similarly, classification normalises a hegemonic interpretation of the world in many different domains, for example gender and sexuality, and presents it as fact.

Many researchers such as Olson take a critical theories approach to looking at knowledge organisation systems, analysing LIS's contribution to issues of bias, and critically evaluating the systems we use (Schroeder and Hollister, 2014). Although Olson's work in general deals with the concept of marginalisation and othering within KOS, and gives examples of racial bias and bias against LGBTQ+ communities, her work is mainly feminist in its approach to issues of bias within KOS and subject language. Olson herself states that within LIS research, critique of the representation of subjects about women has received the most attention (Olson, 2002).

The following section will take a critical-theoretical view of the identified literature around bias within KOS, drawing from, but not subscribing to, any of the more specific theoretical frameworks such as feminism, critical race theory, postcolonialism etc. This is in order to analyse the nature of power and the hegemonic structures within KOS in the broadest sense, shedding light on practices and structures that may marginalise or disenfranchise any groups.

3.5 Critical practice and praxis

In their daily practice, cataloguers and classificationists have an ethical duty to critically question the implications of their decision-making. When they catalogue or classify in this way or that way, who is privileged? Who is marginalised? Who has the power, and who is silenced? Schroeder and Hollister (2014) describe this questioning of power relations and inclusions and exclusions, when it is informed by critical theories, as critical practice. Albeit, they find that often information professionals who are unfamiliar with critical theory are also engaging in such critical questioning from desire to provide egalitarian service and social justice.

Before explaining how critical practice relates to praxis, first we must define the concept of praxis. The notion of praxis has roots in ancient Greek philosophy, but was reconceptualised by Young Hegelian scholars in the 19th Century, as well as Marxist critical scholars of the Frankfurt School, as a term describing action intended to change society. Praxis re-situates research from the theoretical realm and into the real world. From the cognitive to the physical. Praxis makes research practices action-oriented through a continual process of theoretical research, reflection and action (Stevenson, 2010).

Paulo Friere's notion of praxis (2000) is an extension of critical practice which combines theory, practice and reflection, and provides us with a way to put critical theory into action (Schroeder and Hollister, 2014). According to Friere, theory and action must be synthesised together in order to achieve meaningful change. Friere considered that: 'action on its own, isolated from reflection, constitutes mindless activism. Likewise, reflection on its own, divorced from action, constitutes empty theorizing' (Mayo, 2004, p.49).

Several researchers have proposed solutions to combat bias within KOS, some offering solutions employing technology in redemptive ways, some advocating for new ethical frameworks specifically addressing the concerns of cataloguers, and others proposing alternative ways of engaging with KOS to combat bias. The following section will identify proposed solutions for ameliorative change from key LIS texts, and appraise them taking a critical theoretical perspective.

4.0 Existing proposals to combat bias in knowledge organisation systems

The following chapter will outline some of the proposals suggested for ameliorating bias within KOS. These proposals will be examined, and analysed through a critical theoretical perspective to determine their efficacy in combatting bias within KOS.

4.1 Redemptive technology

LIS theorists have suggested several ways to combat bias in KOS. In 2002, Beghtol wrote that with the exception of some of Olson's work, techniques for combatting bias in knowledge organisation had rarely been offered by LIS scholars. It can therefore be surmised that since Berman's work on correction of subject representation in the early 1970s until the turn of the century, although bias in knowledge organisation has been widely discussed as a topic in the LIS field, there had been little debate around practical techniques to tackle bias and create meaningful change in KOS. This section will analyse the suggestions for addressing bias that are based on innovative uses of technology.

4.1.1 Social discovery systems

Several LIS authors have proposed utilising web 2.0 technologies such as social discovery systems to combat bias in KOS.

The advent of Web 2.0 has allowed for a new type of knowledge organization scheme, sometimes known as 'social cataloguing', 'social bookmarking' or 'tagging,' with the resulting set of descriptors known as a 'folksonomy' (Abbas, 2010). Users can generate their own descriptive labels or keywords to describe resources known as 'user generated descriptors' or more commonly 'tags.' This allows users to classify, share and search for resources, using natural language.

Rafferty and Hilderley (2007) advocate the use of social cataloguing taking a poststructuralist view of the non-essential nature of knowledge, since they argue that the meaning of the document is not intrinsic, but derives from the 'interaction of the document and the reader, or viewer.' Therefore, there are many valid interpretations to any document, rather than a

‘single, authoritative interpretation’ presented by the cataloguer’ (Rafferty and Hilderley, 2007, p.398).

Social cataloguing schemes are a decentralized, social approach to indexing which shifts the locus of control back to the user (Petek, 2012; Neal, 2008). Traditional cataloguing schemes containing librarian selected controlled subject vocabulary have been referred to as ‘out of date,’ ‘arcane,’ ‘Anglo-centric’ and inaccessible to non-expert users. By contrast, tags and folksonomies are constantly growing and evolving, accessible to non-experts, inclusive, democratic, responsive to the needs of users and accommodating of diversity (Petek, 2012; Abbas, 2010). Olson (2001) is in favour of making the systems we have more permeable, rather than creating a new standard for information management and scrapping existing KOS altogether. She argues that the systems we have are not irreparably broken and that it is more economical to make changes to the technology we already have. Olson (2001) envisages a system where users enhance traditional bibliographic records by creating links between documents, leaving a trail for future users to follow and increasing the permeability of the system and access to non-mainstream topics.

Drabinski (2013) favours a dialogical approach to how users interact with biased KOS, and believes that users should be encouraged to critically engage with systems at the outset of their interaction with an OPAC. She argues that technological solutions such as user generated tagging makes the user’s stake in designing subject vocabularies material. According to Drabinski, queer theory emphasises the importance of discourse, and so when we come to understand classification systems as something discursively produced, and allow users to engage with KOS and then participate in the creation of KOS they become active stakeholders in designing subject language, and therefore the creation of meaning.

Due to the nature of user generated descriptors, such as the use of uncontrolled ‘free-text’ and natural language, there are many problematic aspects to tagging. Tags can often be inaccurate, redundant, have no synonym or homonym control, contain typos and spelling errors and variant terms, have no hierarchical structure and lack precise retrieval (Peterson, 2008; Abbas, 2010). There are also strengths and weaknesses in the various tagging models on different websites. Some social bookmarking sites have tagging models which encourage sharing and collaboration, where users can critique one-another’s tags, while others have models which allow for the creation of more informal or personal tags (Abbas, 2010). In Petek’s (2012) study of the tagging

behaviour of students, it was found that users mostly assign tags for personal benefit rather than for the benefit of the community, such as users choosing tags that are useful to them but meaningless to the broader community. The question is how to overcome these shortcomings, as imposing any measures of control risks losing the freedom that users enjoy in tagging (Peterson, 2008).

One potential solution to the problematic aspects of social cataloguing is to combine librarian generated tags or cataloguing with user generated tags, allowing the collaborative aspect of tagging while maintaining an element of control. This is the system that Spiteri (2012) envisages, supplementing the controlled vocabularies of cataloguer generated bibliographic records with user generated metadata in the form of tags and reviews. The user generated tags can then describe the intellectual content of works in ways that reflect the points of view of the users, rather than those of library staff. However, it has been argued that tagging and traditional cataloguing systems are fundamentally incompatible and so hybrid systems cannot succeed (Peterson, 2008).

There is also the danger that a folksonomy could contribute to, rather than counteract the slanted nature of a KOS if it disproportionately reflects one culture over others. However, Spiteri (2012) contends that if user generated metadata does reflect a bias, it could be an expression of ‘user convenience and cultural warrant’ that is important and useful for the library community (p.211). Users belonging to minority cultures are still free to contribute metadata that reflects their own viewpoint. As Guimarães has argued, classification schemes that are adapted to local communities can be expected to exhibit a slant, if a classification scheme employing user-generated metadata should exhibit a slant, that is only to be expected as a result of the system adapting to the needs of the local community and reflecting ‘local characteristics, meanings, and idiosyncrasies’ (Guimarães, 2017, p.89). As Guimarães points out, this only becomes problematic when the slants manifest as a bias that justifies segregation or harm through prejudice or proselytism.

4.1.2 Localising classification schemes - shifting meaning to meet local needs

One suggestion for dealing with bias is KOS offered by both Olson (2001) and Guimarães (2017), is the creation of slanted classification schemes that emphasise localisation over standardisation.

Classification schemes are increasingly standardised. Cataloguers often find it more economical to use bibliographic records from standardised repositories such as OCLC's WorldCat, which only contain one record for each item in the database and do not generally contain marginal representations. This means that only small local classifications will vary from the WorldCat standards (Olson, 2002). The advantage of using standardised bibliographic records is the efficiency and economy compared with creating unique bibliographic records for a collection, and increased interoperability between systems, but Olson describes it as 'procrustean' as it does not allow for any variation to take into account local context (Olson, 2002, p.237; Guimarães, 2017).

Guimarães (2017) has reported that not only is it ethical to recognise the existence of slant in knowledge organisation, but that a recognition of slant is a prerequisite for diverse communities, with their own socially constructed domain of knowledge, to communicate with each other effectively at a global systems level.

Olson offers a number of technological ways in which classification systems can be tailored to local contexts, such as using local language in bibliographic records, using alternative thesauri to develop alternative local classification and cataloguing systems, and developing local thesauri to be mapped to universal subject headings (Olson, 2001; Drabinski, 2013). She also argues that spaces should be created in classification systems, 'for the *Other* to fill' (Olson, 2002, p.239). This is a similar position to Beghtol (2002) who argues for information organisation systems to be designed with greater hospitality, using authority control to allow for accommodation of more than one language, and multilingual retrieval systems. Beghtol (2002) also cites Olson's *Woman's* thesaurus, which maps terms from a specialist, controlled vocabulary to DDC numbers (Olson, 2002), as a way to represent subjects differently depending on context, but to maintain interoperability. Lee (2015) argues that changing subject description to reflect the local culture of users provides users with greater access to information.

The idea of creating KOS that allow for local contextual variations relates to the notion of an ethic of care outlined by Fox and Reece (2012). An ethic of care is a strategy that values context and relationships. It was originally derived from feminist theory, but is now recognised to be gender-neutral. According to Fox and Reece (2012), In an ethic of care, knowledge organisation

systems are flexible and accommodate the different cultural and social contexts for users, resulting in classification schemes that are based on the local context.

Although an improvement on standardisation, localising classification schemes is still problematic, as even small local userships can contain diverse cultures with diverse needs. One difficulty with this approach is how culture is being defined. Culture can be national, geographical or 'a collective phenomenon' (Lee, 2015, p.303). Individuals can also possess multiple different cultural perspectives at once. This indicates the difficulty in basing a classification scheme on a 'local' culture. Attempting to adapt classification schemes to a local culture means that classification schemes are still based on user-warrant, albeit the user group is based in a specific locus. It is an attempt to satisfy the majority of users within a particular context, which then inevitably creates bias against minority users. It does not consider how to represent marginalities within the local classification.

4.1.3 Domain Analysis

Domain analysis represents a paradigm shift from the modernist epistemology of knowledge as universal, based on an external order of reality, to a postmodern understanding of knowledge as socially constructed. Domain analysis is a methodological paradigm for uncovering the knowledge bases of a discourse community, to identify the concepts and perspectives that make up the knowledge base, and determine how the concepts relate to one another and how they are used and understood by the group (Smiraglia, 2015).

A domain is best understood as a unit of analysis for the construction of a KOS. That is, a domain is a group with an ontological base that reveals an underlying teleology, a set of common hypotheses, epistemological consensus on methodological approaches, and social semantics. If, after the conduct of systematic analysis, no consensus on these points emerges, then neither intension nor extension can be defined, and the group thus does not constitute a domain.

(Smiraglia, 2012, as cited in Smiraglia, 2015, p.5)

Hjørland is often considered to be the pioneer of domain analysis, with his 'catalysing' paper of 2002 (Smiraglia, 2015, p.19) However, domain analysis has its roots in Mai's (1999) postmodernist conception of domain-centered knowledge organisation (Smiraglia, 2015). The domain analysis paradigm arose through a growing recognition that taking one approach to

classifying all areas, as in traditional universal classification systems, is insufficient to adequately describe the concepts within a field and how they relate to each other. Theorists such as Hjørland began to point out that different subject fields require different approaches to classification (Feinberg, 2007).

The most common methods of domain analysis usually involve various forms of bibliometric analysis, such as text mining; citation, author co-citation and co-word analyses as well as facet analysis. These analytical techniques can delineate domains and generate concept maps for visualising domains (Smiraglia, 2015). According to Smiraglia (2015), it is important to determine the concepts that form a domain empirically, by observing the community whose knowledge base is being captured, rather than rationally through experimentation. A list of terms can then be compiled from the text resources they use.

According to Guimarães (2017), domain analysis is based on the epistemological theories of pragmatism and rationalism. Fox and Reece (2012) refer to the pragmatic ethics of John Dewey, and explain that in the pragmatist approach, there is no definitive view of reality. Pragmatists believe that reality is socially created and is therefore unstable. They argue that concepts are defined by the community that make up the domain and since reality is unfixed, definitions and meaning must be constantly revised, and the cataloguing decision must be 'socially verified' by consulting and studying users to ensure that the classification of the domain remains accurate (Fox and Reece, 2012, p.381).

According to Guimarães (2017), taking a domain analytic approach to classification means that knowledge information can only be understood by a particular community in a particular context, which allows for pluralism. Epistemological pluralism is the acceptance that there are multiple equally valid ways of knowing things, rather than the one definitive approach to knowledge, as in essentialist or universalist approaches. Therefore, a classification system that takes a pluralistic approach accepts the possibility of many different perspectives and interpretations of knowledge; as well as a plurality of users, and accommodates them all within the system. Guimarães claims that this 'brings space to the recognition of culture as a determinant aspect of KO' (Guimarães, 2017, p.91) Theoretically, a pluralistic, domain-centred approach would create egalitarian systems in which no perspective is privileged over any other, and all concepts are considered as equally valid.

Rather than attempting to create classification schemes that represent knowledge in a way that works equally well for all users, the advantage of domain analysis is the idea that information should be organised in ways that suit each specific domain (Mai, 2013). Mai considers domain analysis as an answer to the challenge of how KOS handle issues of 'diversity and conflicting worldviews' by enabling a 'relativistic understanding of classification' (Mai, 2013, p.243-244) which allows for the creation of information systems in which concepts are understood according to context, and the relative cultures in which they are created.

However, Feinberg (2007) questions whether the domain analytic approach can really alleviate bias within KOS. In domain analysis, decisions around determining the boundaries of a domain, or what is included and what is excluded, are left up to the domain analyst or a subject matter expert (Feinberg, 2007). In this way, domain analysis prioritises scientific warrant. Scientific warrant dates back to Henry Bliss's (1929) 'The Organization of Knowledge and the System of the Sciences' in which he argued that classification schemes should reflect the order of nature as determined by science, rather than reflecting the holdings of the collection itself as in previous classification schemes based on literary warrant (Bullard, 2017). According to Beghtol (1995), most classification guides have traditionally used scientific warrant to some degree, as they make reference to consulting experts to organise a literature. Beghtol argues that constructing a classification using domain analysis, based on the opinions of subject experts, is a continuation of Bliss's principle of scientific warrant. The drawback of the application of scientific warrant, according to Bullard, is that it 'presupposes that there are correct names for concepts, one correct structure to relate them, and that it is possible for the classification designer to discover and represent these within a given technological framework' (Bullard, 2017 p.79). This conflicts with the postmodernist epistemology espoused by Hjørland and Mai, where knowledge and meaning are socially constructed and do not correlate to any external truth.

The domain analytic approach contains an assumption that structures of knowledge are there to be discovered through thorough study and investigation by the system designer, after which subject experts can negotiate to reach consensus on an 'ideal definition' (Hjørland and Hartel, 2003; Feinberg, 2007). By privileging a 'majority expert opinion' in this way, the dominant view is prioritised, which constitutes a form of bias (Feinberg, 2007, p.5). Although Hjørland sees seeking expert consensus as a way to closer align with reality, it creates an *Othering* - since views that do not conform to the mainstream opinion are not accommodated within the domain (Feinberg, 2007). Feinberg further argues that domains constructed using majority expert

opinions are not invalid, but they may not be valid for all purposes or all users, and that in order to responsibly incorporate bias, the decision making processes for the selection of terminology and the structuring of domains should be made explicit to users.

According to Feinberg (2007), much of the literature on domain analysis leaves this problem of who determines the boundaries of domains unresolved, or relies on scientific warrant by leaving the decisions to subject experts. Mai (2013) acknowledges the difficulties in balancing the various conflicting values when controversial issues are being classified into a domain, or when no consensus can be arrived at. Mai suggests that in such situations, information professionals require greater ethical guidance than their professional codes of ethics are currently able to provide.

Feinberg suggests that it is not possible to truly objectively define a domain. Constructing a KOS is a process of interpretation, and the creator interprets the information to be included in the domain from a particular position. Bias is inevitable, and is not always a bad thing but it must be acknowledged so that users can identify the system's ideological perspective (Feinberg, 2007). This leads on to the notion of 'trustworthy systems' which will be explored in the next section.

4.1.4 Trustworthy systems

Classification theorists have moved away from the universalist notion of an externally true order of meaning, towards the idea that knowledge is constructed, and is therefore subjective rather than objective (Bullard, 2017). If knowledge and meaning are constructed within information systems, they naturally contain the implicit biases of those who construct it. A number of authors such as Feinberg (2007), Mai (2013), and Bullard (2017) have argued that bias is inherently present within KOS and cannot be eliminated. Rather than attempt to create new information systems that are free from bias, these scholars propose that KOS accept the presence of bias, and incorporate it in a responsible way by making processes transparent, and systems more 'trustworthy' (Feinberg, 2007).

According to Feinberg (2007), creators of KOS are active participants in the creation of meaning, therefore acknowledging decision-making processes should be a central aspect of the design of information systems. Decision-making criteria used in the creation of bibliographic records should be made explicit to the users of information systems. This view is supported by

Long *et al.* (2017) who discuss open transparency in relation to archivists, but which is equally applicable to cataloguers. They claim that such professionals must ‘accept the responsibility to be self-consciously accountable’ for their decision-making processes and should practice open transparency (Long *et al.*, 2017, p.122). Hjørland (2017) adds that cataloguers have to be more responsible for bias within KOS; if they make explicit the perspectives represented in KOS, those perspectives are available to be critiqued and defended.

Similarly, Olson proposes creating search engines where broader, narrower and related terms are displayed, allowing users to understand how documents and concepts are connected within the KOS. These kinds of technical solutions remind users that classification structures and controlled vocabularies are constructed and need not be taken as fact. This would also allow users to have a better sense of the broader organisational structure of the system and allow for more engagement and critique by users (Drabinski, 2013). Transparency can also be achieved by explaining how choices were made, the criteria and methodologies used, and the personal values reflected in the choices made (Cook and Schwartz, 2002). Long *et al.* (2017) also outline some of the ways in which metadata schema and standards can be used to document decision-making processes and provide transparency. Elements in metadata standards such as Dublin Core enable cataloguers to record the actions and decisions made in the creation of bibliographic records, and could help to reveal the processes by which records are made.

It would seem that from a critical-theoretical perspective, the process of open transparency in KOS would be an effective measure to limit bias, as it would allow marginalisations to become more visible for users, which could in turn encourage more critical engagement with systems. Open transparency may also encourage cataloguers to take a more active stance and explicitly consider their decision-making criteria, and encourage cataloguers to admit their implicit biases, since they may be called upon to defend their perspective. However, a process of open transparency or pursuing “trustworthiness” does not correct the underlying systemic bias, or increase discoverability for marginalised topics.

4.2 Alternative ways of engaging with KOS

The following section will analyse suggestions for addressing bias in information systems that are based on alternative ways of engaging with the systems, rather than by developing technological solutions.

4.2.1 Correction

When biased cataloguing decisions and subject vocabulary was first recognised as being an issue for LIS in the late 1960s, librarians such as Sanford Berman campaigned to change the Library of Congress subject headings to use vocabulary that was more inclusive of diversity. In the following decades, other LIS scholars such as Hope Olson have built upon Berman's work. This approach has come under scrutiny from some LIS scholars such as Drabinski (2013) who claim that a policy of correction is incompatible with Queer theory, and glosses over underlying structural prejudice.

According to Knowlton (2005) it is the operating principles of the LCSH which are responsible for biased subject representation, as David Haykin set out in his practical guide to subject headings : '[T]he heading . . . should be that which the reader will seek in the catalog, if we know or can presume what the reader will look under' (Haykin, 1951, p.7). This concept of cataloguing based on user warrant is shared by many cataloguers, and reflects Ranganathan's (1931) fourth law of library science, which directs all library services to be oriented toward the user (Drabinski, 2013; Bullard, 2017). Olson (2002) argues that applying user warrant to decision-making around subject representation, and aiming to please the majority of users, will necessarily result in bias against minority users which violates libraries' principles of unbiased representation (Olson, 2002, p.7).

According to Bullard, some cataloguers take a broader notion of what it is to be user-centred than can be represented by the application of user warrant. These cataloguers are endeavouring to move toward a system that accounts for all potential users, by using correction to deprioritise or obscure terminology which is preferred by the majority of users in order to make systems hospitable for a greater number of users, and are thus prioritising ethical warrant over user warrant (Bullard, 2017, p.87).

Haykin's guideline for assigning subject headings contains two problems, Firstly, it is a fallacy to presume anyone else's worldview, so how can it be possible to know or presume what subject-headings a diverse user-group will look under? Secondly: who is the reader? There is the assumption that there is a singular reader whose information seeking behaviour can be understood by the cataloguer. This recalls the unified view of "the public" as the homogeneous group that Cutter envisaged. It is an exclusionary rather than inclusive guideline, since it

favours users who belong to dominant social groups and creates an “other” who will not find their way of information-seeking considered or catered for (Olson, 2001).

Non-American/Western Europeans, non-Christians, non-whites, non-heterosexuals, and non-males exist in numbers and have always existed in numbers... Ideally the ‘nons’ should not have had to become a force before bias was identified and corrected in the LCSH. But then, ideally, there should be no such concept as ‘nons.’

(Marshall, 1977, as quoted in Knowlton, 2005, pp.124-125)

Biased subject headings began to be recognised as a problematic area in LIS in the late 1960s and one of the LIS professionals most often associated with pioneering this area of research is Sanford Berman. Berman published ‘Prejudices and Antipathies: A Tract on the LC Subject Heads Concerning People’ (P&A) in 1971. Berman’s work critiqued biases that he perceived within LCSH and suggested alternative inclusive subject headings and cross-references to more accurately reflect the language used around marginalised topics and to increase discoverability of these documents for readers and librarians. Many of the changes that Berman proposed in P&A were duly implemented (around 63%), either verbatim or in ways that reflected Berman’s suggestions (Knowlton, 2005). Although LCSH is subject to regular revision, still many of Berman’s suggestions were left unchanged (Ferris, 2008).

Knowlton refers to the changes in the LCSH since Berman’s P&A as ‘hopeful milestones in the continuing effort to provide equal access to all users’ however, whether or not correction of problematic subject language and classification is a means to provide equal access has been contested (Knowlton, 2005, p.218).

Drabinski (2013) argues that an emphasis on correctness disregards the issue of plurality. There is not always one correct term to describe some concepts. She gives the example of the subject heading “lesbian” but points out that many people who come under this subject heading do not self-identify as such. Drabinski has also claimed that the process of correction only serves to mask the underlying structural or systemic problems that cause such biased classification to occur in the first instance. As Drabinski puts it: ‘the trouble with classification and cataloguing in library knowledge systems [is] at the root rather than along the branches’ (Drabinski, 2013, p.100). Drabinski prefers that users instead are encouraged to critically engage with the library

catalogue and to recognise that the way in which subjects are (mis)represented in library catalogues is a reflection of how social groups and issues are seen by the wider society.

Furner adds to the discussion of correction in his article 'Dewey Deracialised' (2007), which discusses the changes to table 5 from the 21st edition of the DDC (Mitchell *et al.* 1996, vol.1, p.446), which allows for number-building as extensions to base numbers using the "basic races" of "Caucasoids," "Mongoloids," and "Negroids," and mixtures of these "basic races" to highlight the racial aspect or perspective of a document. In the 22nd edition of DDC, the racial categories of table 5 (Mitchell *et al.* 2003, vol. 1, pp.660-681) have now been removed, and the table is now named "Ethnic and National Groups." This is an attempt to de-emphasise race and to remove discriminatory classification from the schedule. However, Furner argues that to remove these categories means that works specifically dealing with race can no longer be classified as such and must now be (mis)classified as relating to ethnicity, which contains a different implication, as it relates to socio-cultural heritage, rather than to physical characteristics and genealogy. The decision to remove racial categories and de-emphasise race within the DDC may be based on the notion that race is socially constructed and doesn't relate to a scientific order, however this belies the everyday reality that race is real because people self-identify by these racial categories and social and political power within our society is always distributed along racial lines. Although correction in this instance may at first have appeared warranted, given a modern understanding of the concept of race as socially constructed and at-odds with current scholarship, Furner argues that: 'Unfortunately, eradicating racism is not simply a matter of eradicating the terminology of "race"' and that correction, in this case, has done more harm than good by ignoring the reality of race, as without a belief in and recognition of race, one cannot effectively challenge racism (Furner, 2007, p.165).

Despite the criticisms levied against correction, to leave problematic or biased terminology within KOS uncorrected does not seem to be a desirable alternative. Ranganathan's (1931) fifth law of library science reminds us that the library is a growing organism. Without correction, KOS will remain fixed in time as historical relics, rather than changing and evolving to adapt to the diverse and ever-changing needs of users as the living, growing organism that Ranganathan envisaged. While encouraging users to critically engage with the library catalogue should be a part of frontline library staff's critical practice, cataloguers may not have much direct contact with the users, and they should be concerned with providing access to documents for the

greatest number of users by applying ethical warrant rather than user warrant, and creating systems that are fair for all, correcting problems at both the root and the branch.

4.2.2 Critical engagement

Feinberg agrees that it is not possible to 'fix' biased KOS. She argues that information professionals should work under the assumption that all KOS necessarily include biases, and will 'exclude or marginalize in some way' (Feinberg 2008, p.26). The same should then be applied to the users of the KOS, rather than just the creators/maintainers of the systems. That implies that information professionals have some responsibility to educate users on the prevalence of bias within the systems they are using. Drabinski proposes that frontline library staff including reference librarians engage in dialogue with users to explain the biased and hegemonic structure of KOS. In this way, "front of house" library professionals together with the users can critique the systems without recouring to correction of problematic subject headings and classification (Drabinski, 2013). Drabinski's proposal for educating users on how structures represent knowledge in a slanted way could encourage them to understand the endemic bias in the KOS we have inherited. When encountering biased representation in a library OPAC, users may find themselves questioning: 'Why don't I see myself in the subject vocabulary, and what does this tell me about the other ways I feel invisible?' (Drabinski, 2013, p.107). If this is the case, users may then see how these biases are reflections of biases equally endemic beyond the library walls, and further librarianship's social justice mission by perhaps providing a catalyst for action and resistance.

However, in this model, only those who feel disenfranchised by biased KOS are encouraged to act upon it, it does not affect those who belong to the dominant majority. Moreover, if critical engagement is favoured over correction, there is no progress toward better more inclusive systems that provide access to information for all its users without the need to interrogate systems. Systems that work well should be invisible. In a model of critical engagement over correction, they are visible to those they harm, and those harmed are subjected to conceptual violence each time they interact with the KOS. It also seems counterproductive to critically engage, and then not act upon the perceived marginalisations by attempting to fix them.

4.2.3 Classification based on ethical warrant

In order to reimagine the way that cataloguers interact with organisation systems, and to avoid inappropriate bias, Bullard (2017) has proposed that cataloguers base their cataloguing decisions on ethical warrant, to ensure that ‘the final justification for decisions of terminology and structure [are] ethically sound’ (Bullard, 2017, p.81). Systems must be examined to ensure that the terminology in use is not discriminatory or outdated, that all groups in the user community are represented including minorities and those with divergent viewpoints.

Since classification systems are increasingly large, often with global reach and serving diverse populations, Beghtol (2002) agrees that it is important for information professionals to consider ethical concerns when developing KOS. Bullard argues that cataloguers should prioritise ethical warrant over user warrant when it comes to cataloguing decision-making. Bullard gives the example of a classification scheme for an online repository in which a racial slur is the preferred term for its user groups. She argues that the cataloguers should ignore the consensus warrant of the users and deprioritise the derogatory term, replacing it with more respectful terminology, to maintain the ethical characteristics of the classification system at the expense of user warrant. By choosing not to use problematic terminology, the classification scheme is then useable for a greater number of people (Bullard, 2017).

Information professionals, according to Beghtol (2002), should base their information systems on explicitly defined ethical principles, and that not only should cataloguers make decisions based on an ethical code, but we must discover ways to build these ethical principles into the design and development of KOS. However, as has already been explored in chapter 1, professional codes and ethical frameworks can often be vague and broad, and do not address the specific ethical concerns of cataloguers, such as the directive of ‘avoidance of inappropriate bias’ in the recent CILIP ethical framework (CILIP, 2018). Fox and Reece (2012) draw attention to the fact that much of the literature around ethics in information organisation relates to a general idea of “ethicalness” which is not clearly defined or based on any ethical theory. They also set out several ethical standards applicable to classification, such as Kantian, Utilitarian, Rawlsian, Feminist, pragmatist and Derridean.

In the utilitarian ethical framework, an action is considered right if it produces the greatest amount of happiness for the greatest amount of people. The only motivation for an action should be consideration of the greater good, rather than power or profit. The drawback of this

model is that immoral actions can be justified in order to achieve happiness for the greatest number of people. According to Fox and Reece (2012), this is the ethical framework currently in action in information organisation, as cataloguers employ user warrant to catalogue in such a way that the dominant majority are satisfied, with minority topics and terminology being sacrificed for the greater good (Fox and Reece, 2012).

In a Kantian ethic, an action is ethical if it is done from duty, and we should only carry out actions that would be permissible for everyone to do. When considering an action one must ask oneself: would it be ok if everyone did this? If one can imagine an action to be universalised without contradiction then the action is permissible according to Kantian ethics. There are limitations to this model however. Since one cannot feasibly imagine all the outcomes for complex scenarios, it is sufficient to act according to a sense of duty, whether or not the outcome of one's actions are good (Fox and Reece, 2012).

A Rawlsian ethical framework centres on achieving justice. This ethical framework is concerned with how goods and services, such as access to information, are distributed in society. Moral agents are encouraged to maximise the levels of individual liberty to make them roughly equal with other peoples', whilst distributing wealth in such a way that inequalities are tolerated if they benefit those who are disadvantaged in society. Actions must be reasonable, and must be able to withstand scrutiny (Fox and Reece, 2012).

The ethic of care has feminist origins but is now generally interpreted to be gender neutral. This conception of "care" is a strategy which considers ethical decision-making in context. Rules are bendable and exceptions are possible. Moral agents consider the needs of individuals and collaborate to find the best solution to ethical dilemmas. Under the ethic of care, localisation of systems is preferable to standardisation, as it allows for information to be contextualised at a local level (Fox and Reece, 2012).

In a Derridean ethical framework, people have a 'right to difference' (Fox and Reece, 2012, p.380). "The Other" is unconditionally welcomed, and constraints are not placed on which viewpoints or terminology is welcomed within a system. This ethic gives users a great deal of agency, as all viewpoints and terminology are present within a system, so it depends on the user rather than the information professional to decide what satisfies the user's information need (Fox and Reece, 2012).

In pragmatism, moral agents must evaluate the efficacy of actions to determine their rightness, carefully imagining all possible consequences of an act. In terms of cataloguing, pragmatism requires that cataloguers paly out all possible consequences to a user before making decisions, and that cataloguers must verify the results of their decision making by conducting user studies (Fox and Reece, 2012).

Fox and Reece (2012) then propose an ethical framework for information organisation, based on the best aspects of these ethical standards they outlined.

- **A duty to care:** [...] A duty to care would involve imaginative, empathetic application of standards through cataloger's judgement and an obligation to cater to context to preserve agency.
- **Hospitable, with mitigation:** [...] Hospitality could be combined with a more restrictive system. For example, tags could be used in tandem with controlled vocabularies.
- **Consequence driven, emphasizing improvement of practice:** [...] A functioning system that promotes user satisfaction is a priority. Thus, consequences of justice, care, hospitality, practical efficacy and so forth must be regularly monitored and maintained through iterative feedback and testing mechanisms.
- **Treats people as ends with basic rights and responsibilities:** [...] The practical necessity to take rights seriously stems from the historical realities of discrimination and genocide and forms of conceptual violence that support such atrocities.
- **Prescribes no action we are certain is wrong:** This prevents overt offenses such as the use of terminology like "idiot asylums" for homes for the mentally ill, as in historic versions of *Library of Congress Subject Headings*. It also prevents the deliberate misapplying of standards to inhibit access.

(Fox and Reece, 2012, pp.381-382)

This ethical framework supports the critical theoretical commitment to challenging norms and working towards social justice by promoting rights and equality for all. However, there is no

mention in this framework of the individual cataloguer's responsibility to question or justify their own judgement. Simply applying their judgement is insufficient, as it does not take into account the implicit biases that can be present in that judgement. Furthermore, it is relatively easy to avoid actions we are certain are wrong, such as overtly discriminatory terminology. What is more difficult is avoiding subtler and more insidious marginalisations and micro-aggressions that may easily go unnoticed by cataloguers. This ethical framework does not provide any guidance for the conceptual violence occurring in the grey areas.

4.2.4 Reader-Interest Classification

In numerous public library branches as well as some school libraries, library staff have been experimenting with moving away from traditional classification schemes such as DDC, and replacing it with reader-interest classifications, often developing their own subject based systems or adopting (and adapting) the US book industry subject headings, BISAC (Book Industry Standards and Communications) (Martínez-Ávila, San Segundo and Olson, 2014).

Satija (2004) defines a reader-interest classification as:

A classification designed to serve the immediate needs of the targeted users. Such systems may violate the filiation sequence to bring together disparaged subjects needed by a user group. Indeed these are useful in mission oriented or multidisciplinary subjects. In a commerce college, e.g., it may be more pragmatic to place commercial law with commerce at 380. It is true to say that reader's interest classification adopted so far are not satisfactory in the long run and sometimes correspond to ephemeral vogues. It reflects a middle level of ambition in knowledge organisation. It is a compromise between ad hoc classification and rigorously scientific classification.

(Satija, 2004, p.182)

Generally in a reader-interest classification, categories are based on subjects of interest, as opposed to the DDC, in which categories are based on academic disciplines (Martínez-Ávila, San Segundo and Olson, 2014). BISAC, on the other hand, is based on market needs rather than specifically readers' interests, which Martínez-Ávila refers to as 'market warrant' (Martínez-Ávila, 2016).

The benefit of moving to a reader-interest classification is that it facilitates browsing by grouping materials together by related facet, based on reader's interests. This also serves to eliminate scatter or "distributed relatives", as librarians are able to group together materials which would otherwise be dispersed in a traditional classification system, in ways that reflect their local users' needs.

Using a reader-interest classification mitigates problematic associations often found in DDC when browsing, for example: materials on homosexuality being shelved next to materials on incest and slavery, and the troubling implications that users may infer from such placement within the library (Aubuchon, 2013). Reader-interest classification allows libraries to provide a local solution to the problematic classification in DDC, for example, by moving books on homosexuality from the "psychology/disorders" section to the "health/relationships" section (Aubuchon, 2013). Within a reader-interest classification, librarians can construct conceptual relationships that make sense to the users.

The rationale for switching to a reader-interest classification is all about being user-centred. Making the classification scheme work for users, rather than making the users work to understand and use the classification scheme. Libraries that dispense with DDC often claim that DDC is obsolete, not user-centred, does not support browsing and cannot keep pace with technological developments. They also argue that the academic approach of DDC does not meet the users' needs in their local setting (Martínez-Ávila, San Segundo and Olson, 2014). Although some authors such as Bridgwater (1990) and Aubuchon (2013) refer to problematic implications from the placement of materials according to DDC as one reason for moving to reader-interest classification, Martínez-Ávila, San Segundo and Olson (2014) find that debate around moving from DDC to reader-interest classification usually centres around bringing materials on related subjects together to facilitate browsing, and omits any social-cultural criticism of DDC.

The drawbacks to reader-interest classification are that materials are not organised in as structured a way as DDC. There is no systematic arrangement of categories within the library, the scheme either follows an alphabetic arrangement or is simply random (Martínez-Ávila, San Segundo and Olson, 2014). It may therefore be difficult for some users to navigate. Although BISAC or other reader-interest classification may work well in small public or school libraries, they are generally not considered to be appropriate for larger libraries or for academic settings, as there may be a lack of granularity in categories and subcategories and are not good at

describing complex or interdisciplinary subject matter (Martínez-Ávila, San Segundo and Olson, 2014).

It is often claimed that reader-interest classification can eliminate problems of distributed relatives, or scattered subject matter by rearranging and regrouping of facets based on the reader's interest. However, every facet order will benefit some group of users and not others, so by changing the facet order of subjects, the problem is not resolved, one simply replaces a system that benefits one group with a system that benefits a different group. It is not a solution to integrate all potential users. The only thing that changes is which users are now placed at the "centre" and which are the "Other" (Martínez-Ávila, 2017). On the other hand, in a strictly categorised library, materials will always stay in their prescribed order and will never be gathered, unlike in a reader-interest classification which has the benefit of flexibility; materials can easily be moved to another location if warranted by the interests of the user (Martínez-Ávila, 2017).

Olson also criticises the premise of "reader-interest" as being universalist, as it refers to the singular "reader" (Martínez-Ávila, San Segundo and Olson, 2014). This sees users as a homogeneous group and does not take into account the diverse and potentially conflicting needs and perspectives of any user group, even within a small local community. It is a prioritisation of the needs of the majority, and necessarily results in marginalisation of minority viewpoints. Reader-interest classifications facilitate browsing, but implementing these systems comes at the expense of purposive readers who were well served by the previous traditional classification systems (Martínez-Ávila, 2017). One advantage of looking at reader-interest classification is that it encourages librarians to question who is served by the systems in place in the library, whose interests are grouped and whose are dispersed, and can improve upon the systems we have in place? According to Ainley and Totterdell, 'it is clear that a better overall arrangement than Dewey is both possible and desirable' (Ainley and Totterdell, 1982, p.125). Olson, on the other hand, argues that scrapping the systems we have, in order to create new ones is not practical or economical. She claims that our systems have value, and that we should endeavour to understand their shortcomings in order to develop their potential (Olson, 2002, p.240). Libraries must also consider whether the benefits of such radical localisation outweigh the necessary loss of standardisation and centralisation.

What is clear is that reader-interest classification is an interesting approach, and possibly an improvement for some readers, in some situations, but it is not a solution.

4.3 Summary

Although the above solutions all have elements to recommend them, when subjected to critical analysis most of these suggestions fall short of the mark. In the case of social discovery systems this is because they fail to adequately accommodate minority users' needs. Domain analysis relies on the application of scientific warrant, which in turn depends on an externally true structure of knowledge rather than a poststructuralist understanding of knowledge as socially constructed. A policy of correction can mask underlying systemic inequalities, but conversely, the critical engagement approach encourages users to critique the systems but then does not act on the users' criticisms to change or correct flaws in the systems.

Of the suggestions outlined above, the one with the greatest scope would appear to be the implementation of open transparency towards trustworthy systems, as it makes cataloguers accountable and encourages them to question their ethical decision-making. It also has the benefit of encouraging users to see that information systems are not a reflection of the true nature of the world, but a collection of judgements and decisions made by information professionals and are therefore subject to scrutiny.

The following section will make recommendations for LIS based on findings from the literature and the analysis of the various proposals to combat bias in KOS.

5.0 Recommendations

The literature review in chapter one of this dissertation has considered implicit bias and its role in creating and perpetuating systemic bias, and the analysis in the previous chapter has examined and critiqued some of the proposals previously suggested to mitigate harmful bias when it occurs in knowledge organisation systems. This section will recommend a new approach to combat harmful bias in KOS, based on a consideration of information professionals' individual implicit biases, and taking a social justice approach, which the following section will show is mandated by LIS's professional codes of ethics.

5.1 Social Justice

Many LIS theorists have claimed that LIS as a field is fundamentally concerned with promoting social justice (Furner, 2007; Beghtol, 2005). Social justice is concerned with the creation of a just and equitable society, through the just distribution of goods and services. A contemporary understanding of ‘contractarian’ social justice can be traced back to John Rawls’s (1971) *A Theory of Justice*, which describes a just distribution as one which is made under conditions of equal opportunity, and is to the greatest benefit to the least advantaged people in society. Other, later conceptions of social justice are known as ‘communitarian.’ Communitarian social justice theorists claim that distributions are just if they do not violate the rights or liberties of groups or communities, particularly minority groups or those who have historically been victims of oppression (Furner, 2007, p.150). It is the communitarian conception of social justice as grounded in diversity and emancipation which will form the basis of social justice in the following discussion.

Beghtol and Furner both refer to the United Nations’ (1948) proclamation of its Universal Declaration of Human Rights, when arguing that as a profession, LIS has a duty to uphold and promote human rights and social justice. Article 19 of the UDHR is particularly pertinent to cataloguing and classification.

Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and *to seek, receive and impart information and ideas through any media and regardless of frontiers.*

(Article 19, United Nations, 1948, emphasis added)

Professional codes of ethics such as CILIP’s (2018) ethical framework state that information professionals must promote ‘Human rights, equalities and diversity,’ and IFLA’s (2016) statement that ‘Librarianship is, in its very essence, an ethical activity embodying a value-rich approach to professional work with information’, and IFLA’s code of ethics for Librarians and other information workers which obliges information professionals to:

[...] promote inclusion and eradicate discrimination, [and to] ensure that [...] equitable services are provided for everyone whatever their age, citizenship, political belief, physical or mental ability, gender identity, heritage, education, income,

immigration and asylum-seeking status, marital status, origin, race, religion or sexual orientation.

(IFLA, 2016)

It is clear from looking at these professional codes of ethics that social justice is fundamental to the LIS profession. Therefore, information professionals have a duty to take a social justice approach to classification. This should entail proactively seeking to dismantle the hegemonic social power structures that manifest in our classification systems, in order to provide equal and just access to information for all. Furner agrees when he states that ‘Without taking a proactive social justice approach, we just perpetuate the prevailing power structures and status-quo’ (Furner, 2007, p.153).

5.2 Complex Heterogeneity

When looking at the literature concerning bias within KOS, it is clear that the authors generally take a particular critical perspective such as feminist or CRT in their approach. While it is valuable to look at the issues through a particular lens, as it reveals the specific marginalisations faced by certain groups, as information professionals critiquing KOS, it is important to take a broad approach that considers the perspectives of all marginalised groups. If we focus on very specific issues pertaining to certain social groups, we may miss the broader issue of bias and marginalisation in all its forms.

In order to take a social justice approach to cataloguing and classification, which strives for justice for *all*, we need to give all social groups equitable consideration. Information professionals must recognise the complex heterogeneity of people. Identities and cultures are complex, and marginalisation can occur in multiple ways.

Edward Said (in Leonard 1993, 338) has pointed out that:

All cultures are involved in one another; none is single and pure, all are hybrid, heterogeneous, extraordinarily differentiated ... that we are in our 'history-making' less the 'symphonic whole' ... than 'an atonal ensemble' of complementary and interdependent ... rhetorics.

Therefore, we need to take a multi-dimensional approach to actively strive for equality for all.

The following section will show how an implementation of bias literacy training in cataloguing and classification will constitute a praxis approach to addressing discrimination and bias in KOS.

5.3 Bias literacy

In order to consider how to produce systems free from bias and discrimination, first we need to address the biases of the information professionals building and maintaining those systems.

The literature shows that in LIS, scholars have tended to analyse the systems, and attempt to correct the biases in those systems, when perhaps it would be informative to take a broader view. Rather than solely looking at the systems, we should additionally look at the information professionals who create the systems, and consider how their implicit biases may be reflected in the systems they build and maintain. We then have another avenue to follow when considering ways to combat bias within our information systems, as we can begin to consider methods to reduce the implicit biases of the systems creators.

Implicit biases are negative attitudes and behaviours towards people, often based on age, race, gender, sexual orientation etc, usually amounting to a preference of one's own social group or the dominant group in society. We are often unaware of our implicit or unconscious biases, which diametrically oppose our explicit attitudes and beliefs (Banaji, Bhaskar, and Brownstein, 2015). In other words, we may say (and sincerely believe) that we feel a certain way about various social groups, but our actions reveal that we also harbour prejudices towards those groups.

The first way in which we can reduce implicit bias for LIS professionals is by creating awareness of the ethical issues around cataloguing and classification. Beghtol states that:

Widespread discussion of ethical issues can raise awareness of the kinds of ethical problems that arise and encourage ethical responses throughout the information professions.

(Beghtol, 2008, p.18).

However, a more radical and potentially more effective way to achieve ameliorative change would be a widespread implementation of bias literacy training for information professionals.

As mentioned earlier in this dissertation, other industries and fields have attempted to correct their institutional and systemic bias by providing bias awareness training. Implicit bias awareness training is the idea that we can somehow reveal those implicit biases, and by making people aware of them, allow people to modify their behaviour to reflect their explicit rather than implicit attitudes. Many authors have claimed that acknowledgement of bias is an important first step to combatting prejudice, and researchers and policymakers often use this as a rationale for conducting bias awareness training (Hahn and Gawronski, 2019).

Hahn and Gawronski (2019) compared evidence gathered from six studies into the effectiveness of different interventions for increasing acknowledgement of implicit bias. They found that when people's attention is brought to their spontaneous affective reactions to certain social groups, it can increase their acknowledgement of their bias. However, this could be a double-edged sword, as Vinkenburg (2017) finds that when people become aware of their biases, such as through the use of IATs, they may become angry, confused or defensive. According to Vinkenburg, it is not sufficient to make people aware of their biases, they need to build the skills to mitigate their effects, through experiential learning, and the development of "bias literacy."

Bias literacy is about dealing with the biases that affect our decision-making processes in a conscious way (Vinkenburg, 2017). According to Vinkenburg (2017), teaching bias literacy skills is an effective intervention, as after receiving this type of training people are effectively able to suspend their biases to make more just decisions. This is an improvement on awareness-building types of bias training as it moves beyond creating awareness and gives people tools and strategies to help change their actions.

Carnes *et al.* (2012) studied the effect of bias literacy training, and found that this kind of intervention does have long-term efficacy. They studied attendees of a two-and-a-half hour long bias literacy workshop and found that four to six months after the workshop, 75% of attendees studied demonstrated increased bias awareness and planned to change, or had actually changed, their behaviour as a result of the workshop.

These results indicate that conducting bias literacy training for information professionals is realistic, and worthy of serious consideration. Implementing a program of bias literacy training could effectively change the way that cataloguers and indexers approach their ethical decision-

making by making them aware of their implicit biases and actively implementing strategies to mitigate their effects.

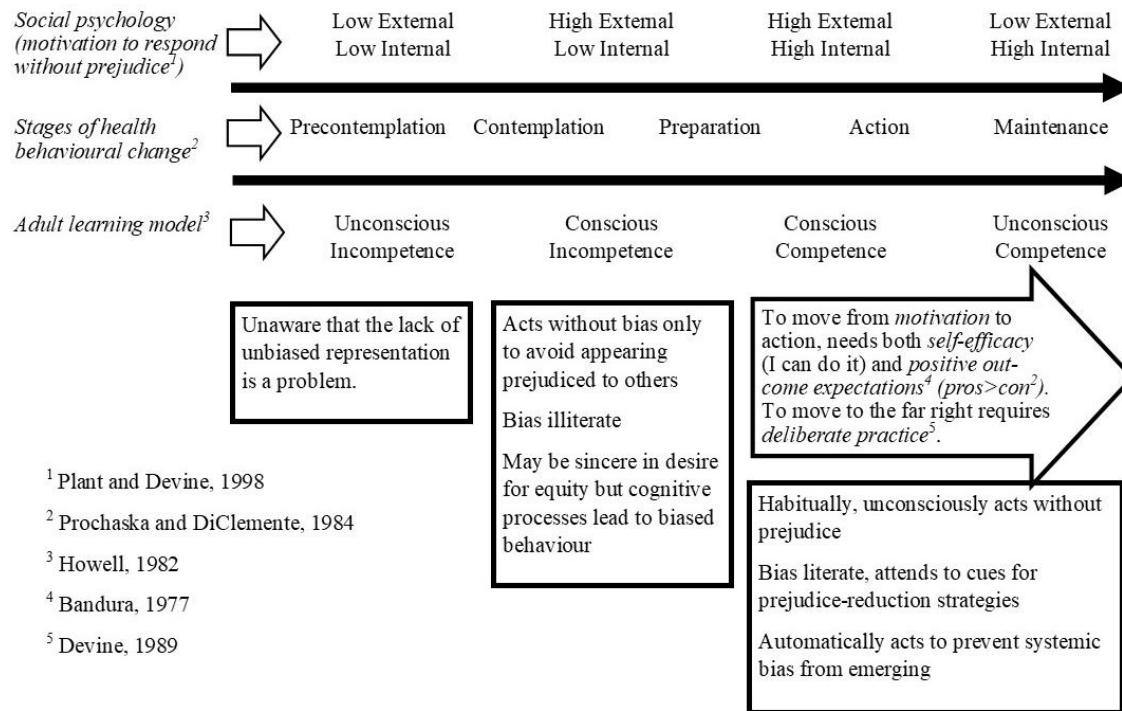


Figure 1. Adaptation of Carne *et al.*'s (2012) Conceptual Model: Progressive movement toward habitually acting without bias.

Carnes *et al.* (2012) present a conceptual model that outlines the stages people and organisations go through before, during, and after bias literacy training. The original model specifically refers to gender bias occurring within organisations, so for the purposes of this dissertation it has been slightly adapted to reflect a broader concept of bias and a systems perspective, rather than an institutional one. The model describes how people transition from a low internal motivation to respond without prejudice, and low competence of acting without bias in the phase before training has taken place, to a high internal motivation and competency in acting without bias in the 'maintenance' phase after receiving training.

During the maintenance phase, we must create ongoing discussion to keep ethical issues of bias at the forefront of professional thinking and to continue the benefits of the bias literacy

training. This would encourage a shift toward critical practice and praxis, and prevent professionals from lapsing into their pre-training habits and thought patterns.

In order to develop ongoing critical praxis within LIS we need to develop the following dispositions identified by Bondy *et al.* (2017): *Radical Openness* - a willingness to engage in dialogue, to be disturbed and surprised. To be curious about others' beliefs. *Humility* - recognising that we only know a little of the sum of available knowledge, and so remain open to new ideas and ways of thinking. *Self-Vigilance* - Continue to critically examine our ideologies and perspectives, and ensure that we remain open and humble. These three dispositions are a reminder that social justice praxis is an ongoing, lifelong process which requires ongoing effort (Bondy *et al.*, 2017).

5.4 Summary

Addressing bias in KOS through an implementation of bias literacy training can be considered an application of critical praxis because it involves self-reflection in terms of identifying one's implicit biases, reflective action in terms of employing strategies to mitigate the effects of one's implicit biases, and collective reflective action in terms of creating a professional culture of ongoing ethical debate, with the development of more just knowledge organisation systems as a common goal (McLaren *et al.*, 2010). By addressing information professionals' implicit biases, we are getting closer to the root cause of discrimination. Implicit bias is the illness, of which biased KOS is a symptom - we need to treat the illness if we hope to cure the symptoms. By combining this critical praxis approach with the approach of open transparency towards trustworthy systems mentioned in the previous section, critical engagement will be occurring simultaneously at both ends of the system. All stakeholders will then be actively participating in a process towards more equitable information systems. This approach could also complement more systems-based approaches to tackling bias such as Hjørland and Mai's domain analysis or Olson's specialised thesauri.

6.0 Conclusion

This research has shown that if we want to create systems that do not marginalise or discriminate, we need to take a broad perspective on the causes of the discrimination and

attempt to correct the bias at both the root, the implicit biases of cataloguers, and the branches, the systems they create and maintain.

This dissertation aimed to discover how and why bias manifests in knowledge organisation systems. The research has shown that there are multiple causes of bias. The classification systems commonly used reflect the particular worldviews of the place and time of their creation. The warrants employed in the construction of KOS such as LCC and LCSH mean that the terminology used reflects that of the published works. The terminology of privileged insiders are represented, while outsiders are marginalised. Otherwise, systems are based on the majority users' language and terminology, which necessarily marginalises minority users. The research also shows that the implicit biases of information professionals can lead to biased information systems. Since implicit bias as a contributing factor for biased KOS has not been explored within LIS literature, further research in this area could be beneficial.

This dissertation aimed to discover what solutions the LIS field have proposed to tackle bias. Several suggestions have been made for ways to tackle biased KOS. Some suggestions such as creating social discovery systems, localised systems or moving towards trustworthy systems use technology in innovative ways to combat perceived biases. Other suggestions involve reimagining the ways that information professionals and users engage with existing classification systems, such as by correcting problematic language, critically engaging with catalogues, applying alternative warrant for classification procedure, or moving to different classification systems entirely in the hopes of achieving a less discriminatory outcome.

These suggestions tend to be limited in their efficacy, as they do not consider the various ways in which marginalisations can occur, and do not consider the many various causes of discrimination and bias which can bring about biased knowledge organisation systems.

One suggestion that would seem to have the potential to create a less discriminatory KOS is the notion of trustworthy systems. By making systems transparent and trustworthy we can allow people to interact with systems while simultaneously allowing them to engage with and critique the classifications and terminology within them. They are also able to see the systems as the product of humans, and therefore fallible and indicative of a particular worldview, rather than representing some universal truth.

A better way to address this issue is approaching it from a psychological perspective. This allows for a consideration of implicit bias when contemplating methods to mitigate bias within KOS. We then have another prong of attack, and are able to break the cycle of bias by remedying it at an individual as well as structural level. Bias literacy training is the first step for individuals to move towards critical praxis, and to break the cycle of bias at the individual level.

Researching this issue using an extended literature review meant that it was possible to get a broad perspective on the subject and how it has been approached in the LIS literature so far. Conducting exhaustive searches on LISTA and SUPrimo as well as citation chaining means that one can be confident that the key literature on this topic was identified. However, this study was constrained by the time limitations of the research project. Had there been more time it is possible that more relevant literature could have been discovered. Although it would not have changed the thread of the argument in this dissertation, it is possible that identifying more relevant literature would have contributed more detail and nuance to the arguments contained in this research.

As information professionals, we have a duty to provide access to information without barriers and free from inappropriate bias. Therefore, it is our professional duty to address our implicit biases and begin the process of correcting them by acknowledging them and employing strategies to mitigate their effects in our decision-making processes. This will not be an easy undertaking; it will require effort and constant vigilance. However, in order to fulfil our professional obligations, it is something we must do.

Information systems serve increasingly diverse communities, and by not proactively addressing biased cataloguing and classification we are passively contributing to the discrimination faced by marginalised communities. This goes against the social justice mission of information professionals, and reminds us that neutrality in this case does not serve those facing discrimination. Information professionals have an ethical obligation to act.

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