Is What You See What You Get? *Medical Subject Headings* and their Organizing Work in the Violence Against Women Research Literature †

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ABSTRACT: In this paper we argue that the broader definition of classification offered by sociologists and by Geoffrey Bowker and Susan Leigh Star addresses pertinent knowledge organization processes that we can use to investigate the moral, scientific, and aesthetic implications of different kinds of knowledge organization systems. We do so by systematically investigating the organization of the violence against women research literature by medical, allied health, and social sciences bibliographic databases and in particular by the National Library of Medicine's *Medical Subject Headings* (*MeSH*). Our findings indicate that underlying these knowledge organization systems are certain discourses on violence against women that may reinforce a gender-neutral understanding of violence.

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1.0 Introduction

Violence against women is a prevalent social problem with devastating impact for women and their children, families, communities, and societies. Scholarly work examining this issue has been broadly multidisciplinary with established research traditions in sociology, criminology, psychology, political science, family studies, and, more recently, nursing, allied health, and medicine. This diversity of scholarly activity brings to bear a number of perspectives on this issue, with remedies proposed to prevent or address it at the various levels of its genesis and impact. Recently, and especially with the growing emphasis on "evidence-based" decision-making in the areas of social policy and human service provision, efforts have been made to synthesize "research evidence" arising across these disciplinary traditions (e.g., Wathen and MacMillan 2003; Ramsay et al. 2009); the argument for doing so asserts that a comprehensive understanding of the "best evidence" on this issue is a precursor to developing appropriate and effective interventions across the full range of potential sites for prevention and response. As evidence continues to emerge for the effects of violence against men, this too will be a site of active knowledge-seeking.

Gaining this comprehensive understanding, however, presents those attempting to do this synthesis work with a practical problem—retrieving the "evidence" from the various and varied repositories that house it. These repositories—usually online bibliographic databases—are generally discipline-specific, and as such developed and maintained in the context of the dominant traditions of each discipline, including, importantly, the language used to describe and define specific phenomena. The present paper analyzes the structuring of research knowledge in the area of violence against women, framed as an examination of the language used in knowledge organization systems—especially in health and social science sources—that construct our information retrieval practices in this area. We argue that these underlying structures may impede, rather than facilitate, our ability to access "evidence" and hence create new knowledge in this area.

2.0 Structuring knowledge: knowledge organization systems

Classification, in the colloquial sense, is indebted to Aristotle as, for example, his syllogism is seen to be one of the first attempts to arrange knowledge in a hierarchical fashion (Olson 1999), and he and his protégés were responsible for producing a classification that divided practical knowledge from theoretical knowledge (Dolby 1979). Aristotle's classification of knowledge was taken up in the seventeenth and eighteenth centuries by proto-scientists such as Francis Bacon. Classifications were used by these scientists to consolidate their understanding of reality (Kusukawa 1996), a process now recognized as disciplinarity work, or the way that modern disciplines, such as science, control the organization and production of knowledge (Foucault 1972; 1978). While library classifications arose shortly after this period, Miksa (1998, 41, emphasis in original) notes that nineteenth century librarians were not concerned *per se* with arguments about the legitimacy of science (this was implicitly accepted); instead, "they appear simply to have adopted *the utility of the method* used by the classificationists of knowledge and the sciences to portray knowledge." This method involved the practical task of making the knowledge found in books accessible to users. Our current understanding of classification in library and information science (LIS) follows from this method, as the definition usually refers to a formalized system that organizes entities, usually information-bearing items, in some manner, usually hierarchically, in order to aid in the practical task of information retrieval (see, for example, the definition offered by Reitz 2004-2010).

Miksa (1998) notes that, aside from LIS, several other disciplines are concerned with the study of classification, such as mathematics, statistics, natural history, psychology, anthropology, and philosophy. Classification in these disciplines may also refer to a formalized classification system and the methods through which it was developed (e.g., a "taxonomy" as developed through the methods of ethnobotany), or it may refer to the process of classifying by individuals, groups, and institutions. For instance, classification in psychology is used interchangeably with taxonomy to refer to the process of hierarchical categorization by individuals, where categorization refers to the process of differentiating kinds of categories, so that the same output (mental category "bird") occurs with the same kind of input (physical entity "bird") (Murphy 2002). In sociology, from which our analysis primarily draws, classification is used in a broader manner to refer to the "conceptual distinctions individuals make in the course of their everyday lives, and how these distinctions can, and do, influence more durable and institutionalized social differences" (Pachucki et al. 2007, 331). This kind of inves-

tigation is concerned with the analyses of the organization of concepts and how these concepts become stabilized into structures that tangibly affect lives. Bowker and Star (1999), for instance, discuss the relationship between symbolic boundaries (classifications) and social boundaries (legislation), when they discuss legislation in Africa in the 1950s that required people to be classified by racial group. The authors note that the brutal cruelty enacted by racist legislation went on for more than four decades as "millions of people were dislocated, jailed, murdered, and exiled" (Bowker and Star 1999, 197). In this paper we argue that a sociological framing of classification can help further analysis into some of the "moral, scientific, and esthetic" (Bowker and Star 1999, 319) implications of our knowledge organization systems. Further, we argue that an LIS-specific understanding of knowledge organization systems can help to deepen critical investigations of these systems, for example, by teasing out their complex functions and priorities. Our analysis focuses on a particular knowledge organization tool, the National Library of Medicine's *Medical Subject Headings* (*MeSH*), and this tool's representation of violence as a topic. As such, in our analysis we align ourselves with the movement in LIS towards pragmatic analyses of knowledge organization systems and their concepts (Beghtol 1998; Hjørland and Albrechtsen 1995; Mai 2004), a focus that attends to the "actions, situations, and consequences of inquiry" (Creswell 2007, 22).

We further suggest that Bowker and Star's (1999) theoretical insights can be applied to other knowledge organization systems, such as thesauri. Classification is considered a prominent activity in knowledge organization. For instance, aside from classifications and categories (subject headings, classification schemes, taxonomies), Hodge (2000) also identifies term lists (authority files, glossaries, dictionaries, and gazetteers) and relationship lists (thesauri, semantic networks, ontologies) as types of knowledge organization systems. In LIS, knowledge organization is usually defined in a narrow sense as "the nature and quality of such knowledge organizing processes (KOP) as well as the knowledge organizing systems (KOS) used to organize documents, document representations, works and concepts" (Hjørland 2008, 86). It may also be conceived in a broader sense as "the social division of mental labor" (Hjørland 2008, 86). We suggest that this broader definition of knowledge organization also more closely aligns with Bowker and Star's (1999, 10) definition of classifications as "spatial, temporal, or spatio-temporal segmentation[s] of the world." With this broader understanding of boundary work and knowledge organization, we hope to show how Bowker and Star's methods for "infrastructural inversion," or methods that seek to make visible the invisible effects of classifications, can be applied to *MeSH*'s treatment of violence.

2.1 Infrastructural inversion techniques

Bowker and Star's (1999) "infrastructural inversion techniques" for "'reading' infrastructure and unfreezing some of its features" (Star 1999, 384) are useful for exploring the limits of key characteristics of knowledge organization systems in order to make them visible. While the bulk of research about classifications and knowledge organization systems analyzes the functional properties of these tools, such as the efficiency of subject access, updating standards, practical applications of tools, and modernizing systems to meet an increasingly globalized and digitized clientèle (Chambers and Myall 2010; Saumure and Shiri 2008; El-Sherbini 2008; Miksa 2007), Bowker and Star (1999) ask us to view classifications, or as we have argued, knowledge organization systems, as a text that can be read for its cultural values, or as a boundary object that mediates the interests of divergent parties. As Nardi and O'Day (1999, 31) discuss, this kind of reading can help us to uncover the intentionality and meaning of technologies by understanding that they represent "a form of communication, a carrier of meaning that may be reinterpreted as the technology passes through different social situations." While this strategy involves "new eyes" to read knowledge organization systems in a nonstandard way, Bowker and Star (1999, 37) do offer six strategies to ease the process. Specifically, they ask us to investigate the following characteristics of knowledge organization systems: ubiquity, or the absolute saturation capacity of knowledge organization systems; materiality, or their physical, material effects; indeterminacy, or the tendency to mediate our knowledge of the past through our current knowledge; practical politics, or the pragmatic reasons behind decisions to designate certain categories as visible or relevant and other categories as invisible or irrelevant; convergence, or the ways in which knowledge organization systems and social worlds combine with each other through a process of mutual constitutions; and resistance, or the reality that is constructed through the categories that resist or remain visible. Before applying these techniques to *MeSH*'s treatment of violence, we first briefly describe our objects of analysis—*MeSH*, MEDLINE, and

MedlinePlus—and give some context on violence against women as a topic.

3.0 The National Library of Medicine's *Medical Subject Headings*

The National Library of Medicine (NLM) has produced a standardized thesaurus, referred to as *MeSH*, since 1954. The *MeSH* system is used to index, catalogue, and search for biomedical and health-related information and documents. Over 25,000 *MeSH* headings are used to index and search the over 5,200 biomedical journals in the MEDLINE database, as well as to catalogue books, documents, and audiovisuals for the NLM and other health-based libraries. *MeSH* is organized alphabetically and hierarchically into tree structures with 16 broad categories (e.g., Anatomy, Organisms, Diseases, etc.) that are each subdivided into one or more categories. Subject specialists add new *MeSH* headings primarily according to literary warrant, as staff find terms emerging in scientific literature, and user warrant, as terms are suggested by indexers and others.

PubMed, a free interface for the database MEDLINE, and MedlinePlus, an influential consumer health website, are also services of the NLM. *MeSH* also connects the Health Topic pages found on MedlinePlus, to relevant materials from MEDLINE, via the free PubMed interface, and is also based within other influential knowledge organization systems, such as the Cochrane Library and the Excerpta Medica database (EMBASE). Thus the NLM provides a single authoritative access point to both academic and consumer health information resources. A therefore significant health-product of the NLM, *MeSH* offers health-specific subject headings for indexers, cataloguers, researchers, and consumer health-information seekers.

4.0 Violence against women

As indicated above, scholarly work examining violence against women has been broadly multidisciplinary with several established research traditions engaging in a wide variety of theoretical and empirical research in this area. The definitional constraints faced by violence researchers are recognized as an impediment to developing assessment strategies that can compare experiences of violence, understand causes and consequences of violence, and develop effective violence intervention and prevention efforts (Kilpatrick 2004; Saltzman 2004; Waltermaurer 2005). In general, definitions of violence can vary based on such factors as behaviour (e.g., sexual assault), experience (e.g., psychological abuse), relationship-context (e.g., marital, common-law), targets (e.g., women, spouses, children), and settings (e.g., workplace, home); in disciplines, they can vary by tradition (feminist, family studies, health), perspective on causes (e.g., pathology, learned behaviour), or scope (self-inflicted, interpersonal, community). As O'Neill (1998, 480) and others have noted:

> Approaching the [violence] problem from any particular discursive position involves committing oneself to a particular definition of the problem and an intervention approach that, from another discursive perspective, may ultimately be more harmful than useful.

In our paper, we briefly draw attention to evolving definitions of violence, relying especially on feminist and public health definitions of this concept. Since violence and, in particular, violence against women (VAW), is approached from a multidisciplinary agenda, it does not necessarily make sense to segment disciplinary definitions. For instance, Jordan (2009, 412) suggests that "connecting the multiple disciplines that study VAW can facilitate the emergence of new theory, bridge controversies in definitions, and strengthen methodologies." As such, we mainly draw attention to definition differences in order to appropriately frame our discussion of violence headings used in *MeSH*.

4.1 What's in a name? Definitions of violence against women

The feminist movement has played a pivotal role in establishing violence against women as a societal problem through such efforts as reforming relevant laws and policies, providing services for victims, increasing efforts to prevent violence against women, and framing this issue as a public health concern (Kilpatrick 2004). Historically, feminists have argued that violence against women is a form of male oppression that is symptomatic of the imbalance in gendered power relations rooted in patriarchy and, as such, have argued for the importance of gender-specific violence terminology, such as "battered women" and "violence against women" (Currie 1998). Such gender-specific terminology is still preferred. For instance, Saltzman (2000) edited a two-part special edition of the scholarly journal *Violence*

Against Women that brought together material from a workshop on Building Data Systems for Monitoring and Responding to Violence Against Women cosponsored by the US Departments of Health and Human Services and of Justice. Summarizing the findings from this workshop, Saltzman (2000, 700, emphasis in original) distinguishes between violence against women (VAW) and violence and abuse against women (VAAW):

> *Violence is a term that encompasses a broad range of maltreatment against women.* It includes five major components of maltreatment: physical violence, sexual violence, threats of physical and/or sexual violence, stalking, and psychological/emotional abuse. It was suggested that in future writings, the phrase "violence and abuse against women" might be used to refer to the combination of the five components, whereas the smaller combination of the first three components should be considered to comprise a category of "violence against women."

In this conception, violence against women is also seen to incorporate "intimate partner violence (IPV), sexual violence by any perpetrator, and other forms of violence against women (e.g., physical violence committed by acquaintances or strangers)" (Saltzman et al. 1999, 1).

This gender-specific terminology has been critiqued, particularly by family studies researchers. For instance, Steinmetz' study, *The Battered Husband Syndrome,* examined data obtained by Straus and Gelles (1986) and posited that wives committed more "acts of violence" against their husbands than the reverse. Steinmetz (1977-78, 507) argued that more attention and resources should be directed at "all forms of family violence." Terminology was cited as a "camouflage" to husband-beating, as more attention was seen to be paid to "wife-beating" and the "battered wife" (Steinmetz 1977-78, 504). Correspondingly, proponents of this tradition suggest the need for neutral definitions of interpersonal violence, such as spousal abuse, partner violence, or family violence (Gelles 1974, 1979; Gelles and Cornell 1985; Gelles and Straus 1988; Straus and Hotaling 1980; Straus et al. 1980). Critics have charged that the primary measure used by Straus and Gelles (1986) and many other researchers, the Conflict Tactics Scale, failed to report incidents where women acted out of self-defence or fear of their abusive male partners (Kurz 1989). The tension between these two disciplines regarding the prevalence of women's violence against men and corresponding definitions of violence is still a point of discussion for violence researchers (see, for example, Migliaccio 2002; Barnett et al. 2005).

The attention by health researchers to violence is a more recent phenomenon. In 1992, the American Medical Association declared violence against women to be a major public health problem (AMA 1992), a recognition of the significant prevalence (Tjaden and Thoennes 2000), health effects (Campbell et al. 2002), and costs (Centers for Disease Control and Prevention 2003) of violence on women and their children, and on society. This statement was soon echoed by a number of organizations, including the World Health Organization (Krug et al. 2002), and framed as both a public health and a women's health issue (Cherniak et al. 2005). Thus, the last 20 years has brought the issue of violence against women into health research and practice.

It has been suggested by several violence against women researchers that the public health approach represents a useful definitional breakdown of violence (Saltzman 2004; Kilpatrick 2004). The WHO's World Report on Violence and Health (WRVH) defines violence as (Krug et al. 2002, 5): "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation," and specifies that violence can be self-directed, interpersonal, or collective. Most of the research concerned with definitions of violence focuses on what the WRVH calls "family/partner" violence, and WHO documents specify that "[i]ntimate partner violence" (IPV) is the preferred term for public health discussions of violence and refers to "physical, sexual, or psychological harm by a current or former partner or spouse" (Rutherford et al. 2007, 677). This definition further recognizes that, while women may be perpetrators of violence and while violence may exist between same-sex couples, "the overwhelming burden of partner violence around the world is borne by women at the hands of men" (Rutherford et al. 2007, 677), a position generally supported by major national and international health organizations (Watts and Zimmerman 2002).

The characterization of violence in the health field, and hence its inscription in existing knowledge organization systems, is of particular interest since it highlights these historical and definitional tensions. As an indicator of the breadth of coverage of the violence against women literatures in the MEDLINE da-

tabase, and family violence literatures more broadly, a recent (July 2010) search (via PubMed) of the subject heading "Domestic Violence" (see below), yielded over 28,000 unique results. In addition, at least 13 journals with the word "abuse" or "violence" are indexed in whole or part by MEDLINE, along with 48 journals dealing with criminology or criminal law, and 49 journals dealing with women's health or gender issues generally. This is in addition to general medical, nursing, psychology, and sociology journals that include research on violence and abuse. In this study, therefore, we explore how *MeSH* treats the topic of violence and in particular violence against women. We focus particularly on three of Bowker and Star's (1999) infrastructural inversion techniques, practical politics, convergence, and materiality, to ask the following questions:

1) What design decisions—i.e., practical politics—inform *MeSH* categories, and how does this shape its ability to represent the concept of violence against women?
2) How do *MeSH* headings and discourses of violence against women co-constitute one another (convergence)?
3) What is the general topography—i.e., materiality—of *MeSH*?

5.0 Methods

Bowker and Star's (1999) infrastructural inversion techniques ask us to view knowledge organization systems in non-standard ways. In this investigation, we applied three of their techniques—practical politics, materiality, and convergence, described above—to the *MeSH* system as it relates to violence against women. Our data consisted of all subject headings and entry terms narrower than "Violence," as well as headings related to the concept of battered women (see part 1 of the table in Appendix 1). Under "Violence", all headings associated with the concept of domestic violence were also collected (e.g., "Domestic Violence," "Child Abuse," "Elder Abuse," and "Spouse Abuse"). In order to investigate the practical politics of *MeSH*, we examined the principles and standards informing *MeSH*, many of which are made available to the public on the NLM's site (see, for example, http://www.nlm.nih.gov/mesh/staffpubs.html). We investigated convergence in *MeSH* by comparing *MeSH* violence headings (Appendix 1) to literature on violence against women, especially relying on Jordan's (2009) insightful summary of the literature. To see how the concept of violence is understood in other health and health-related fields, we followed a similar process to examine violence-related headings in CINAHL, PsycINFO, and Sociological Abstracts (Appendix 1), the primary bibliographic databases for the nursing and allied health, psychology, and sociology literatures, respectively. Finally, we investigated the materiality of *MeSH* by examining how each violence heading in *MeSH* worked to organize health research literature by examining how these headings were mapped onto information and documents in MEDLINE and MedlinePlus.

6.0 Findings

6.1 *Practical politics:* MeSH's *design and the concept of violence*

Bowker and Star's (1999) practical politics refers to the design issues involved in constructing knowledge organization systems. The authors suggest that, while some design issues appear universal, they are actually the result of ongoing negotiations and conflict. The results of these negotiations lead to a decision about what categories and topics will be visible in the system at the expense of others. This kind of critique is similar to the classic examination of *Library of Congress Subject Headings* by Berman (1993) and others (e.g., Olson 2007). Further, Olson (1998, 235) suggests just this point: "that any system or structure has limits, and that replacing one system with another will simply define different limits rather than being all inclusive." The point of practical politics is thus not to replace a system, though this may well occur, but to trace the design features and in particular how these design features affect what these systems exclude or make invisible. As Bowker and Star (1999, 45) note, tracing a system's practical politics can be immensely challenging and time-consuming, as "once a system is in place, the practical politics of these decisions are often forgotten, literally buried in archives (when records are kept at all) or built into software or the sizes and compositions of things." This is also true of *MeSH*, as the product remains the only record of on-going indexing decisions (S. Nelson, National Library of Medicine, personal communication, March 22, 2011), although the NLM's attempt to make visible the policies and standards informing *MeSH* decisions on their website is commendable.

MeSH is a highly sophisticated technology that follows principles established by the late military surgeon John Shaw Billings (Schulman 2000), as well as standard principles for thesauri (Nelson et al. 2001).

The principles and standards shaping *MeSH* serve as a navigational guide to help users through the system. Bowker and Star's technique of practical politics, however, suggests that these conventions also position certain terms as visible and others as invisible within the system. Our investigation of this point will focus on how the formal statement of *MeSH*'s mandate (below) influences the representation of violence, as each word in the mandate was carefully selected; they operate as "logical constraints" on *MeSH* (Nelson et al. 2001, 176).

MeSH's mandate is to "provide a reproducible partition of concepts relevant to biomedicine for the purposes of organizing knowledge and literature" (Nelson et al. 2001, 176). In this statement, "reproducible partitioning of concepts" implies that *MeSH* headings must be understandable, meaningfully distinct, consistent, current, and valid. Several tensions result from these guidelines. Nelson et al. (2001), for example, discuss how *MeSH* headings must reflect current scientific theories, but that these theories may eventually be disproven or displaced, rendering *MeSH* headings as outdated. This is arguably the case with the *MeSH* headings "Spouse Abuse," which, as will be shown below, no longer reflects current violence against women literature.

The reference to "concept" in the M*eSH* mandate reflects the evolution of *MeSH* from a term-centric system, where a *MeSH* heading was created for every term (e.g., "Spouse Abuse," "Partner Abuse," and "Wife Abuse"), to a concept-centric system, where a *MeSH* heading is created for a preferred term of a preferred concept (e.g., "Spouse Abuse"). From an LIS perspective, the use of heading-entry term relationships allows for non-redundancy of headings, an essential aspect of the *MeSH* system for many users. LIS practitioners have also noted several limitations of these relationships. Olson (2003), for instance, argues that subject headings, in general, privilege the hierarchical ordering of terms, require the use of authoritative language (i.e., controlled vocabulary, preferred terms), and imply that there is one audience using the headings. In order to ensure non-redundancy, some terms are rendered non-authoritative (e.g., "Atrocities" is an entry term in *MeSH*) and others invisible (e.g., "Dating Violence" is not a *MeSH* heading or entry term, although it represents a significant health threat [see, for example, Silverman et al. 2001]).

Reference to "biomedicine" in the *MeSH* mandate reflects its domain focus. As Nelson et al. (2001, 176) discuss, "that *MeSH* must cover all ideas relevant to biomedicine simply reflects the fact that many ideas not central to biomedicine might nevertheless be of interest." Thus, *MeSH* headings may not be added according to their presence in scientific literature, but according to their relevance as a biomedical topic. This can be shown in the violence literature. For example, while "domestic violence" first appears in the titles of articles in 1980, "Domestic Violence" was not added as a heading until 1994. The late entry of this heading perhaps reflects the 1992 AMA declaration that violence represented a significant health threat to women, thus rendering the topic medically relevant.

The *MeSH* mandate, "for the purposes of organizing knowledge and literature," reflects that *MeSH* is used "not solely for indexing or for cataloging, but also to support retrieval" (Nelson et al. 2001, 177). *MeSH* indexers are instructed to follow the above mandate, as well as to prefer document-centered rather than user-centered indexing (Browne and Jermey 2007), to choose the most specific heading and to allow for post-coordinate searching. To allow for representational integrity, changes to *MeSH* headings are not preferred, although 54 headings were changed in 2011 alone (Schulman 2010). Criteria for potential *MeSH* changes include consistency with the mandate *MeSH*, trade-off between currency and validity, URU criteria (i.e., understandable, reproducible, useful), and consistency with Soergel's (1985) notion of hierarchy. Indexing standards and practices may also render terms as non-authoritative or invisible. For instance, indexing to allow for post-coordinate searching relegates gendered terms, such as "Wife Abuse," as non-authoritative. Further, while indexing from a document-centered perspective ensures non-redundancy of headings, it simultaneously decreases potential user-term overlap. "Intimate Partner Violence," for instance, is not listed as a heading or entry term in *MeSH* and does not easily map onto the available *MeSH* headings.

As Schulman (2000, n.p.) suggests, changes in *MeSH* also "mirror how American and international biomedicine has evolved, how the knowledge maps have changed, and show how innovation and invention have grown more rapidly in some areas than in others and how areas differ in degrees of increasingly more specific terminology." That *MeSH* offers so few subcategories for violence topics could reflect the positioning of only some forms of violence as medically relevant. This point will be discussed further below; however, what is important to note here is that an investigation of the conventions of systems can help us think about how the structure of these systems and their indexing practices are situated and contested.

6.2 Convergence: knowledge organization systems as boundary objects between disciplines

Bowker and Star's (1999) convergence asks us to think about the ways in which knowledge organization systems and social worlds combine with each other through a process of mutual constitutions. Bibliographic classification systems are often designed from a rationalist or empiricist perspective, whereby terms are added according to user, terminology, or literary warrant. Knowledge organization systems, however, can also incorporate a social constructivist perspective by recognizing that "knowledge is a product of historical, cultural, and social factors, whereby fundamental division and the fundamental concepts are products of the divisions of scientific/cultural/social labor in knowledge domains" (Albrechtsen and Jacob 1998, 296). Designing knowledge organization systems this way requires an open dialogue with those that the system is meant to serve. For instance, efforts were made to develop an HIV/AIDS vocabulary that supported "dialogue between the different communities involved with the HIV/AIDS epidemic, including clinical and medical researchers, practitioners of alternative medicine, nutritionists, psychotherapists and other professionals, as well as those individuals who are either living with the disorder themselves or are caring for someone who has contracted disease" (Albrechtsen and Jacob 1998, 298). By enabling mediation between divergent groups, knowledge organization systems become boundary objects that "both inhabit several communities of practice and satisfy the informational requirements of each of them" (Bowker and Star 1999, 297). By investigating the textual content of these systems as boundary objects (i.e., the actual terms employed), we can better understand the vocabularies used by those engaged in discourse around a topic and identify areas of disconnect or conflict, as well as those perspectives that may be marginalized or silenced. This kind of analysis is similar to Hjørland and Albrechtsen's (1995, 400) call to study domain-analysis, or "the knowledge-domains as thought or discourse communities, which are parts of society's division of labor." Hjørland (2002), in fact, cites Bowker and Star's (1999) work as an example of a pragmatic, domain-sensitive approach to the understanding of classifications. Using Bowker and Star's concept of *convergence* to investigate *MeSH*'s definitions of violence-related concerns can therefore directly speak to disciplinary pressures faced by this scheme and its keepers.

First, it should be noted that *MeSH* does not attempt to serve the interests of all of the research traditions outlined above, nor was it designed in the first instance to organize consumer-oriented knowledge. And while it now indexes some allied health professions, the mission of *MeSH* is undoubtedly biomedically focused (refer to above). That said, an examination of how the concept of violence entered into the knowledge organization system can shed light not only on the way violence and its health implications were defined at the time of entry (as indicated above, "Domestic Violence" was added to *MeSH* in 1994), but also on how these concepts were and were not articulated in the documents (e.g., research articles in journals) that were and are being indexed. Jordan's (2009) attempt to summarize the field of violence against women literature offers a useful comparative source, using descriptive and evaluative bibliometrics as well as citation analysis in order to "demonstrate historical movements in the field's literature" (Jordan 2009, 401). Her analysis used 11 keywords (wife battering, spouse abuse, interpersonal violence, domestic violence, intimate partner violence, rape, sexual assault, sexual violence, sexual harassment, stalking, and psychological abuse) in four key databases (MEDLINE, PsycINFO, Sociological Abstracts, Social Work Abstracts, and Westlaw) and two journals (*Hein Online*, *Harvard Law Review*) to access older legal literature at four separate index years (1977, 1987, 1997, 2007). In terms of volume of literature, MEDLINE was found to offer "by far the largest volume of VAW-related literature across both index years and keywords, PsycINFO the second largest, Sociology Abstracts the third, and Social Work Abstracts a distant fourth" (Jordan 2009, 402). In terms of term frequency of use, Jordan (2009) found that "wife battering" was minimally used across all databases; "spouse abuse" peaked in use for behavioural science and legal literature in 1997 and increased in use in PubMed; and "intimate partner violence" and "domestic violence" reflected more recent terms, as they peak in use in 1997 and 2007 across all databases. Jordan (2009, 408) suggests that the "growth and decline of certain keywords also evidence an evolution in the field's understanding of VAW, as terms such as "spouse abuse" and "wife battering", for example, have been replaced by "domestic violence" and "intimate partner violence."

MeSH partially reflects this evolution in terminology. For instance, while the preference for "Spouse Abuse" in *MeSH* over the entry term "Partner Abuse" implies to a user unfamiliar with equivalence relationships that spousal relationships are the pre-

ferred relationship type, the definition of this term as "deliberate severe and repeated injury to one domestic partner by the other" does allow for married and non-married partnering. Indexers, however, are informed that either the "wife" or "husband" could be the abused or abuser, which favours the gender-neutral definition of violence by family violence researchers, as well as married partnerships. While there is a category for "Battered Women," the definition is framed entirely in terms of women's victimization in abusive relationships, as compared to feminist/public health definitions that recognize the structural nature of gender-based violence. The NLM's *MeSH* indexers are also instructed to prefer the heading "Spouse Abuse" over "Battered Women," which obscures the role of this heading. We suggest that the limited number of violence headings offered by *MeSH* and the specific framing of these headings as gender-neutral have the potential to not only limit access to materials, but also to close off discussion between various interested parties. Users' natural language terms and conceptions of violence are instead mapped onto or squeezed into *MeSH* without alternative options. A potential solution to this problem could be the consistent indexing of violence against women information with the *MeSH* heading "Women" or "Men" to indicate a gendered focus of the article. (Using the check tag, "Female," is unfortunately not an effective strategy for retrieving gendered results as the check tag, "Male," is also often also used to indicate the presence of a male abuser.) The usefulness of this indexing practice must also be communicated to novice searchers, who are seldom aware of advanced searching strategies. This specific framing of violence in *MeSH* becomes more serious when considering how various discourses are mapped onto *MeSH* in other databases, a point that will be discussed below.

6.3 Materiality: knowledge organization systems as embedded artifacts

Bowker and Star's (1999) materiality refers to the physical, material effects of knowledge organization systems. They note that cognitive idealism, or the idea that categories and classifications are solely products of the mind, can hinder our understanding of the material effects of knowledge organization systems. Instead, they highlight (39) that classifications "are built into and embedded in every feature of the built environment (and in many of the nature-culture borderlands, such as with engineered genetic organisms)." A common characteristic of knowledge organization systems is their embedded nature—they are "sunk into and inside of other structures, social arrangements, and technologies" (Star 1999, 381). That these systems are embedded artifacts often obscures their function as knowledge organizers. *MeSH* headings, for instance, are sunk into various NLM information retrieval aids, such as MEDLINE and the popular consumer health website MedlinePlus. While the embedding of *MeSH* in MEDLINE and MedlinePlus enables users to gain access to valuable health-related resources through the greater retrieval power afforded by index terms, this relationship also necessarily implies the retrieval of knowledge according to the structure and content of *MeSH*, which we analyse below in an attempt to uncover the materiality of *MeSH*.

6.3.1 MEDLINE

How user-generated vocabulary interacts with *MeSH* depends on the MEDLINE interface. In MEDLINE@OVID, users' keywords are directly mapped onto *MeSH*. In PubMed, users have the option to select the *MeSH* database, where their keywords are then directly mapped to *MeSH*. The violence vocabulary found in *MeSH* can therefore present a significant hindrance for those seeking violence research citations. Appendix 1 presents the violence and domestic violence descriptors and entry terms offered in MEDLINE, CINAHL, PsycINFO, and Sociological Abstracts. MEDLINE, compared to the other databases, offers the fewest violence-related descriptors or entry terms overall (e.g., descriptors for "Community Violence," "Patient Assault," "School Violence," are present in other databases, but not MEDLINE). CINAHL and PyscINFO both also offer "Domestic Violence" and "Intimate Partner Violence" as their main partner-violence descriptors, which reflect the evolution in violence against women literature as discussed by Jordan (1999). All of these databases, not surprisingly, offer violence-related descriptors consistent with their disciplinary perspective. That CINAHL, for instance, incorporates such descriptors as "Patient Assault" and "Workplace Violence" could reflect the discourse in this discipline that emphasizes the importance of a holistic approach to patient care (May and Fleming 1997) and the nature of certain patient-provider interactions. The varying preference for domestic violence and family violence descriptors also suggests a distinct relationship, by these disciplines, to the definitional controversies presented by these terms. Only Sociological Abstracts, for instance, of-

fers "Spouse Abuse" as a descriptor. This database also uses "Family Violence" as a descriptor. PsycINFO, in contrast, removed "Family Violence" from its index in 2006 and re-indexed related material with the descriptor "Domestic Violence." The framing of violence-related terms by these disciplines presents a significant challenge for users who seek to use these databases from a different disciplinary perspective, for those who attempt to search across databases with terms derived from one controlled vocabulary, and for those who use non-controlled keyword searches.

While there is no doubt that many technologies have significant productivity benefits in terms of automation of routine and repetitive work tasks, it is also the case that technology can also obscure and shift work around. As Star and Strauss (1999, 20) point out, work becomes "displaced—sometimes onto the machine, as often, onto other workers." In databases such as MEDLINE, users are required to negotiate terminology that may not fit their conceptual understanding of their search topic; this may have potentially adverse consequences when a user is unaware of the proper *MeSH* heading, or when no appropriate *MeSH* heading is available for a given topic. The term "battered women," for instance, was first seen in the title of articles indexed in MEDLINE in 1977, although this term did not enter the *MeSH* scheme until 1995. The term "patient abuse," which is used in CINAHL and PsycINFO, but not MEDLINE, first appeared in an article indexed in MEDLINE in 1978. The indexing of this article by the *MeSH* heading "Nurse-Patient Relations" further obscures the role of violence/abuse in patients' and nurses' lives and increases the effort made on the part of the user to retrieve relevant information. The term "intimate partner violence" was first seen in the titles of articles in 1997, although this term is still not included in *MeSH*, even as an entry term. While *MeSH* cannot seek to incorporate all knowledge into its scheme (this would render the system unwieldy), the extensive indexing of some topics at the expense of others and the implications of this practice are important to consider.

6.3.2 MedlinePlus

In general, the language of the consumer-health website MedlinePlus provided by the NLM "reflects users' expectations as expressed in their own search words" (Miller et al. 2004, 378). The information found on MedlinePlus, however, is also organized by *MeSH* and other knowledge organization systems, such as the Unified Medical Language System (UMLS), in several different ways. In some instances, Health Topic articles may directly reflect the terms offered by *MeSH*, usually "when they coincide with consumer use in search logs, consumer-focused documents, and other sources" (Miller et al. 2004, 378). For instance, while the *MeSH* heading for cancer is the technical term "Neoplasm," MedlinePlus uses the more common term "Cancer" for their Health Topic page. As violence terminology tends to be less technical, several of the violence terms found in *MeSH* are also found in MedlinePlus. For instance, "Child Abuse," "Elder Abuse," and "Domestic Violence" are found in *MeSH* as well as in the Health Topics in MedlinePlus. Alternatively, "Teen Violence" is MedlinePlus specific. Further, while the definition of "Domestic Violence" in MedlinePlus, like *MeSH*, is gender-neutral, MedlinePlus does offer a gender-specific qualification: "It ['Domestic Violence'] is the most common cause of injury to women ages 15 to 44." "Domestic Violence" is also listed as a topic under "Women," but not under "Men," creating a potential barrier to those interested in men as victims of abuse.

While MedlinePlus offers unique health information in its Health Topics, it also serves as a portal for users to connect to external health information sources. It is here that *MeSH* more obviously works to reconstruct knowledge. MedlinePlus Health Topic articles are directly linked to MEDLINE articles by *MeSH*, and *MeSH* terminology is used to connect MedlinePlus users to other NLM resources (e.g., to ClinicalTrials.gov). For instance, clicking on "Domestic Violence" journal articles in MedlinePlus maps users onto domestic violence resources in PubMed in the following formats: reviews, guidelines, clinical trials, and patient education handouts. In this search, "Domestic Violence" is used as a *MeSH* term, but "Battered Women" and "Spouse Abuse" are not used. Alternatively, choosing clinical trials for "Domestic Violence" at the time of writing led users to five current trials listed in ClinicalTrials.gov that were open or recruiting. Searching "Abused Women" in the same manner yielded two open and recruiting trials that were not retrieved through the MedlinePlus search. Searching "Violence Against Women" without quotation marks retrieved 17 trials, which, though not all relevant to violence against women, did offer unique hits from those found in the MedlinePlus search. It is not our argument that an "Abused Women" heading would remedy this challenge– it would certainly also exclude results—or that using keywords instead of *MeSH* headings would ensure a more effective strategy. Expert searchers recognize the need to search

with both keywords and *MeSH* headings to ensure access to most of the literature (even when conducting systematic reviews it is recognized that it is virtually impossible to access all of the literature). Those persons for whom MedlinePlus was designed (families and friends of patients) are presumably novice searchers who do not use advanced searching strategies (Eysenbach and Köhler 2002). We think, however, the 'black box' that knowledge organization systems, such as *MeSH*, represent to many users needs to be investigated in more detail, and made explicit to users. In this case, the mapping of consumer health searches by *MeSH* to external resources results in a significant restructuring of information and, in the case of "domestic violence," may actually reduce the amount of relevant information made available to users.

7.0 Discussion

In this paper we have investigated, through Bowker and Star's (1999) strategies of practical politics, convergence and materiality, some of the invisible effects and implications of the NLM's *MeSH* as a system for organizing knowledge. The effects of these strategies are often challenging, if not impossible, to differentiate (e.g., decisions about what categories to include, 'practical politics' often involve a negotiation between discourses, i.e., 'convergence'). In truth, attempting to view knowledge organization systems through these strategies at all requires "new eyes" "for restoring the deleted and desiccated narratives to these peculiar cultural, technical, and scientific artifacts" (Bowker and Star 1999, 37). Like Bowker and Star (1999), we argue that doing so is a worthwhile endeavour to make explicit the ethical and political work of these technologies. Further, we recognize that many of the limitations that we address in *MeSH* are also true of other knowledge organization systems, the specificities of which will be left to future research.

Investigations of practical politics, or the pragmatic reasons behind decisions to designate certain categories as visible or relevant and other categories as invisible or irrelevant, indicate that the topography of *MeSH* positions certain terms as visible and others as less visible or invisible within the system. By exposing the limits of *MeSH*, new ways of organizing information are revealed that can apply directly to the organization and retrieval of research knowledge on violence against women. As Olson (2007) notes, the structuring of classifications is inherited from Aristotelian logic, whereby concepts are divided linearly and hierarchically into mutually exclusive categories. This ordering of language, however, is only one of the many possibilities available for classification construction. She suggests alternative methods of organizing information that allow for multiple equivalent headings to be employed concurrently. For instance, other tested methods for information organization would enable users to search in MEDLINE with preferred *MeSH* headings ("Violence") and entry terms ("Assaultive Behavior," "Atrocities," "Battered Women"), as well as variant spellings ("Assaultive Behaviour") and currently unavailable terms ("Teen Violence," "Violence Against Women"). These alternate organization and retrieval methods could be applied to the many venues that the NLM currently serves, including MEDLINE and MedlinePlus, and could offer searches that produce more relevant and comprehensive results.

Investigations of convergence, or how *MeSH* and discourses of health and violence co-constitute one other, reveal that *MeSH* is partially reflective of current violence against women literature. Within the thesauri of two databases that are also relied upon by health and violence researchers to access information about violence against women, CINAHL and PsycINFO, the descriptors "Domestic Violence" and "Intimate Partner Violence" are preferred. These terms reflect the evolution of the field's understandings of violence against women. In contrast, "intimate partner violence" is not listed as a *MeSH* heading or entry term in *MeSH*. In the place of this term is the heading "Spouse Abuse," which can imply a preference for married couples. This heading is also reflective of the gender-neutral terminology preferred by family violence researchers. "Battered Women" is also the only gender-specific heading available in the scheme, and indexers are instructed to prefer the heading "Spouse Abuse" over "Battered Women." The headings "Women" or "Man" could be used to indicated gendered material, if this strategy was consistently used across different databases (to allow for comparative search strategies), and if it was known by novice and expert searchers. Given that it is widely acknowledged in the medical literature that the preponderance of health effects of violence are borne by women (e.g. Campbell et al. 2002), this embedding of gender-neutrality in the primary medical database represents a significant challenge for accessing gendered material. As has been recently articulated by Samuelsson (2010) in an analysis of how feminist research is classified in Swedish KOSs, this incomplete representation of gendered terminology is not uncommon.

As evidenced from our investigation of *MeSH*'s materiality (or its physical, material effects), these

gender-neutral definitions are not only embedded in MEDLINE, but they also order consumer health information. In the NLM's MedlinePlus, gender-neutral understandings of violence are preferred (e.g., Health Topics are available only for "Domestic Violence"), and gender-neutral terms direct users to information about clinical trials and journal articles, rendering gender-specific information unavailable. Seale (2005) argues for the importance of paying special attention to the production and representation of consumer health information, and our investigation of *MeSH* suggests that critical studies of internet health information could also benefit from examining the underlying infrastructures of websites, including how knowledge organization systems order information on these sites. Given the increasing emphasis on health care "consumers" "empowering" themselves with health information and advice to live healthier (and less costly to health systems) lives (Salmon and Hall 2003; Harris et al. 2010), there is an urgent need to examine online health information seeking and its structural underpinnings in a more critical manner. In the case of MedlinePlus, our analysis indicates that the ordering of health information by *MeSH* may actually direct users away from relevant online information about violence against women and toward information about gender-neutral understandings of violence.

The limitations of *MeSH* reflect a common struggle to communicate across knowledge boundaries. *MeSH* is meant to serve the biomedical community specifically, but is also relied upon by users outside of this discipline. The availability of MEDLINE information via free forums (e.g., PubMed, MedlinePlus) further opens up its knowledge to outside communities, including health-interested social scientists and consumer health information seekers. In a sense, these NLM resources fail to effectively communicate knowledge across these boundaries and, in the case of violence, adopt the language employed by some traditions (family studies) over others (women's studies, public health). Carlile (2002, 451-452) notes that an effective boundary object

> establishes a shared syntax or language for individuals to represent their knowledge; provides a concrete means for individuals to specify and learn about their differences and dependencies across a given boundary; [and] facilitates a process where individuals can jointly transform their knowledge.

While asking *MeSH* and MEDLINE to serve communities beyond biomedicine would undoubtedly reduce its effectiveness, communication beyond biomedical realms may be especially relevant for those topics that are interdisciplinary, as is the topic of violence. MedlinePlus, further, is a system for the general public. As such, the above steps might provide a starting point for communicating knowledge across disciplinary boundaries. The NLM does provide a form for users to suggest the addition of potential *MeSH* headings, and new headings, changed headings, and deleted headings are all noted. The reasoning behind these changes (practical, political, otherwise) is currently not available to general audiences, which impedes learning across boundaries.

Olson (2002, 4) suggests that "naming information is the special business of librarians and other information professionals." As librarians employing these naming practices, "we decide how to represent subjects and, thus, affect access to and use of information contained in and knowledge derived from the documents we catalogue" (Olson 2002, 4). LIS would therefore benefit from a more careful examination of both the naming practices of librarians and the systems that they create, as both represent significant silent and invisible organizational tools. Our investigation of *MeSH* has shown that the ordering practices created by NLM's medical librarians have an impact on the structuring of both professional and consumer health information. Yet, despite the importance of the NLM in the world of medical information, no significant studies of their indexing practices have been undertaken. While Bowker and Star (1999) suggest that no one is truly in control of infrastructure, the NLM clearly plays a significant role in the creation and maintenance of the infrastructures that organize medical information. It seems pertinent to ask, then, how exactly categories that order this critical information are produced and who holds the power to make decisions about their creation, modification or dissolution.

Our analysis was limited in that it concentrated specifically on the treatment of violence in one system, *MeSH*, primarily by focusing on the NLM indexer's product (i.e., the *MeSH* descriptors themselves and any available indexing notes) as opposed to their indexing process (as, for example, Bowker and Star (1999) do in their analysis of the building of the Nursing Interventions Classification). Thus, future research opportunities abound. Roth's (2005, 609) investigation of scientist's "classification" practices through ethnographic research reveals "how different

resources are drawn upon to identify an unknown specimen, how a new category comes to be reified by modifying an operational definition until it captures what perception appeared to have recognized as distinct, and how scientists stabilize both perceptual distinction and classifiers until these different orders converge." We imagine an investigation of NLM's indexers would be similarly illuminating. What resources are relied upon by NLM staff to index interdisciplinary terms? How are new *MeSH* categories reified by previous *MeSH* headings and the structure of *MeSH* itself? How do *MeSH* indexers stabilize their indexing practices so that it becomes a science itself? Olson's (2002, 225) post-structural critique of subject representation in library catalogues reveals, for example, that "we can move toward solutions, but cannot find a magic formula that will represent all of existence, or even all of recorded information, all of the time, in all contexts, without marginalizations and exclusions." What marginalizations, exclusions, or solutions would a post-structural critique of knowledge organization systems reveal? Further research in this area could also extend the analysis of the databases we used as simple comparators (CINAHL, PsycINFO and Sociological Abstracts) and perhaps include new, potentially relevant sources, especially the increasingly influential "grey literature" sources accessible online (Neal 2010). The infrastructures that guide our information systems are ripe for analysis through a more critical lens.

8.0 Conclusion

The intent of our analysis has been to demonstrate the usefulness of the broader framing of classification offered by sociologists and Bowker and Star (1999, 319) for understanding the "moral scientific, and esthetic" implications of knowledge organization processes. Through this frame, we demonstrated how various discourses regarding violence against women have embedded themselves first in key definitions of the phenomenon, and, from there, to the underlying knowledge organization practices and systems of the bibliographic and other databases in this area. LIS has long embraced the insights of other disciplines and in particular a sociological perspective (see, for example, Cronin 2008), and yet our investigations of classification have not seemed to take up this theoretical analysis with as much verve. As Hjørland (2002, 428) notes, classification research "seems to share many of the same kinds of weaknesses and strengths as the production of subject guides: it has a high practical value, but it is difficult and time-consuming and has too little academic reward." In this paper, we suggest that an investigation of knowledge organization systems in this manner can help to bolster the theoretical strength of our analysis. We do not suggest that pragmatic understanding of classification should be neglected, or that the continued efforts by the NLM to help researchers better access information resources are unwarranted. We think that the practical knowledge of systems from LIS can help to tease out the complex functions and priorities of these systems and that the NLM represents an important potential mentor in this process.

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Appendix 1. Violence subject headings in selected databases

Descriptors and Entry Terms Offered by Various Databases*

MEDLINE (*MeSH*)		CINAHL**	
Descriptors	Entry Terms	Descriptors	Entry Terms
Violence		Violence	
Domestic Violence	Family Violence	Community Violence	
Child Abuse	Child Neglect	Domestic Violence	Family Violence
Child Abuse, Sexual	Child Molestation, Sexual	Child Abuse	Battered child syndrome
Maunchausen Syndrome by Proxy			Child Neglect
Elder Abuse	Aged Abuse	Child Abuse, Sexual	
	Elder Neglect	Maunchausen Syndrome by Proxy	
Spouse Abuse	Partner Abuse	Elder Abuse	Aged Abuse
	Wife Abuse		Patient Abuse in Old Age-
Terrorism	Radioactive Terrorism		Patient Abuse IOA
Bioterrorism		Intimate Partner Violence	IOA
Chemical Terrorism			Partner Abuse
Mass Casualty Index	Mass Casualties		Spouse Abuse
September 11 Terrorist Attacks	World Trade Centre Attack, 2011		Battering of Husbands
			Battering of Wives
Torture			Battering of Women
Battered Women	Partner Abuse		Husband Abuse
	Spousal Abuse		Partner Violence
	Wife Abuse		Wife Abuse
		School Violence	
Battered Child Syndrome		Sibling Violence	
Shaken Baby Syndrome		Student Abuse	Campus Violence
		Torture	
		Verbal Abuse	
		Workplace Violence	
		Battered Women	Abused Women

Descriptors and Entry Terms Offered by Various Databases*

PsycINFO		Sociological Abstracts	
Descriptors	Entry Terms	Descriptors	Entry Terms
Violence		Violence	
Domestic Violence	Family Violence	Combat	
Intimate Partner Violence		Family Violence	Conjugal Violence
			Domestic Violence
Patient Violence	Client Violence	Mass Media Violence	Television Violence
School Violence		Political Violence	
Violent Crime		Assassination	
Homicide	Murder	Coups d'Etat	Military Coups
Filicide		Rebellions	Insurrection
Genocide			Revolt/Revolts
Holocaust		Mau Mau Rebellion	
Serial Homicide	Serial Murder	Peasant Rebellions	
Physical Abuse		Terrorism	
Political Assassination	Assassination (Political)	Battered Women	
Rape		Abuse	Cruelty
Acquaintance Rape	Date Rape	Assault	
Terrorism	Terrorists	Child Abuse	Battered Children
Bioterrorism		Child Neglect	
Workplace Violence		Elder Abuse	
Battered Females	Battered Women	Emotional Abuse	Psychological Abuse
Child Abuse	Child Maltreatment	Family	
Elder Abuse		Family Conflict	
Emotional Abuse	Psychological Abuse	Family Law	
Family Conflict		Family Stability	
Family Relations	Family Dynamics	Home Environment	Family Environment
	Family Life	Infanticide	
Marital Conflict		Partner Abuse	
Partner Abuse	Spouse Abuse	Sexual Abuse	
Physical Abuse		Social Problems	
Sexual Abuse		Spouse Abuse	Wife Abuse
Shelters		Stalking	
		Victimization	Crime Victimization

* 1. All descriptors and entry terms narrower than 'Violence' were collected, as well as descriptors and entry terms related to the concept of battered women. 2. Under 'Violence', all descriptors associated with the concept of domestic violence (e.g., 'Domestic Violence', 'Child Abuse', etc. —these descriptors are highlighted in the table) were collected. 3. Descriptors and entry terms that varied in spelling and syntax were not included; those that are repeated in different aspects of the thesauri are only listed in their first instance.

** CINAHL by Ebsco no longer lists entry terms or related term.