METAPHOR AND IDEOLOGY IN BIOTECHNOLOGY

A study of metaphor in media's discourse on reproductive and genetic biotechnology and bioethics

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Abstract

Metaforer er virkningsfulle retoriske redskaper som er med på å forme vår virkelighetsoppfatning gjennom å fremheve og å skjule. Innenfor feltet kognitiv lingvistikk er metaforer sett på som essensielle. Ikke bare som en måte å utrykke seg på, men også for tankevirksomhet og handlinger. Hvordan vi snakker om et konsept kan også påvirke hvordan vi tenker om det aktuelle konseptet og følgelig også påvirke vår oppførsel ovenfor det vi snakker om og tenker på. Denne studien undersøker forholdet mellom metaforer og ideologi i seks amerikanske aviser i deres diskurs om bioteknologi og bioetikk. Avisene representerer to ulike politiske holdninger, nemlig liberalisme og konservatisme. Målet er å undersøke hvilke kildedomener som blir brukt for å konseptualisere *barn, mor, graviditet, behandling/felt* og *debatt*, og videre om valg av kildedomener har en sammenheng med avisenes politiske ståsted. De liberale og de konservative avisene viser flere likheter enn forskjeller i valg av metaforer. Dette kan være et resultat av at avisenes valg begrenses av de metaforene som til en hver tid skapes og brukes av forskerne innenfor feltet. De forskjellene som ble funnet viser at det er ikke hvilken *type* metaforer som blir brukt som skaper forskjellene men heller *hvordan* de blir brukt.

For my grandfather Mikal Rundhovde (1927-2011)

Remembered with a smile

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List of abbreviations:

IVF   In Vitro Fertilization

PGD   Preimplantation Genetic Diagnosis

CMT   Conceptual Metaphor Theory

CDA   Critical Discourse Analysis

CMA   Critical Metaphor Analysis

COCA Corpus of Contemporary American English

COHA Corpus of Historical American English

BNC   British National Corpus

OED   Oxford English Dictionary

MIP   Metaphor Identification Procedure

MML   Master Metaphor List

SPSS   Statistical Package for the Social Sciences

'If metaphor serves to put us back on course, and leads us back into reflecting upon what language is and what we do with it […] [we] will see in linguistics not the dry analysis of objective laws and structural constraints, but the locus of becoming, the ongoing birth of worlds, worlds to create and transform, together in speech' (Underhill 2011: 16)

1. INTRODUCTION

During the past three decades the function of metaphor in language has been given growing attention. This is due to the fairly novel realization that the frequency of metaphorical expressions used in our everyday language and the range of metaphorical influence are much greater than previously assumed. The rise in interest for metaphor studies can largely be ascribed George Lakoff and Mark Johnson and their book *Metaphors we live by,* which was published in 1980.The book was groundbreaking in the sense that it challenged the existing notion of metaphor and established metaphor's pervasive quality. The authors claimed that metaphor is essential to the way human beings understand and interact with the world and with each other. The notion of metaphor as pervasive and inextricably tied to thought processes and world perception makes it meaningful to further develop the theory of cognitive metaphor and to apply it to a variety of fields to gain even more in-depth knowledge about the role metaphor plays in shaping thoughts, language and worldviews.

Since metaphor has been recognized as such an important part of thought and action, more and more effort has been given to the research of metaphor in a variety of fields, such as advertising, gestures/body language, music, art, etc. Still, more research is needed to fully understand the social and discursive functions of conceptual metaphors.

One rapidly expanding field where the social and discursive functions of metaphor are interesting to further examine is the field of biotechnology. A 2011 article in the *New York Times Magazine*, *The two minus one pregnancy*, debated the process of aborting one or more of the fetuses in a multiple pregnancy. The article discussed how biotechnological sciences allow us to intervene in more and more aspects of human life, both to prolong and to create it. Also, it addressed the issue that a consequence of this continuous pushing of boundaries of what is possible, is that science outruns our ability to reach a new moral equilibrium (*New York Times Magazine*, August 10, 2011). The new biotechnological development brings about a series of novel ethical and moral dilemmas that are not easily resolved. The language used to discuss these dilemmas contributes to establishing the moral and ethical boundaries for the field ahead, as well as paving the way for future research. It is therefore important that an approach to the field and to the discourse regarding the field is given careful thought.

The development of biotechnology is of public interest, as it presents society with both new possibilities and new fears. One of the main sources of public information concerning

biotechnological advances and development is the news media; hence, the way the news media presents this information is not unimportant. Nerlich et al have stated that:

> The media are a central arena in which battles over the social impact of genetic advances are fought. By framing stories in certain ways through the use of well-established linguistic frames […] they play a critical role in shaping public understanding of genetics and genomics (Nerlich et al 2003: 473).

Moreover, it is important to keep in mind that the media is an arena of ideological dispute. The way the stories are framed is naturally dependent on the ideological standing of the newspaper and how the paper wishes to portray the issues debated. So, how is the media's language and use of conceptual metaphors shaped by their ideology? Knowles and Moon hold that 'The ideas, assumptions, and beliefs of a culture are present in its conventional metaphors, even if it is not apparent on the surface. One way to examine ideology is through metaphor' (Knowles and Moon 2006: 12). As mentioned above, how stories are framed is essential to the way they are conceived and understood by the public. One such way of framing stories in the news media is the use of conceptual metaphors to highlight some aspects of the discourse, whilst hiding others. An example is the way we conceptualize argument as war through expressions such as 'He *attacked* my point of view', 'I *defended* my position as best I could' and 'She *shot down* his arguments'. In arguments we see our opponents as *adversaries* that we *attack.* We *defend* ourselves, and we seek to *win* the argument. By talking about arguments in these terms the competitive, hostile and war-like qualities of arguments are highlighted and we think of and view arguments as battles or war. At the same time as the war-like qualities are highlighted, other aspects of the target domain are hidden. By focusing on the competitive and hostile qualities, we forget that arguments also require a certain degree of cooperation and that the aim of the argument is to come to a common understanding or solution (Lakoff and Johnson 2003: 10). Thus, highlighting and hiding through the use of metaphor in media discourse is an efficient rhetorical tool that can be used to subconsciously affect readers and thus shape public opinion in the debate. Hence, it is important to be aware of the potential effects of metaphor in media discourse.

Metaphor is pervasive. Language is not separated from the world; on the contrary, it shapes thought and worldviews. Hence, the way information is presented in the media affects and shapes public opinion. Further, biotechnological news stories with bioethical questions and debates are potent for metaphor because they can cause strong emotional involvement and emotions are often expressed through the use of metaphor. Also, the technical procedures debated are quite complex and are often referred to and simplified by using metaphorical

terms. The focus of this thesis will be on the functions of metaphor as a tool for establishing and sustaining ideology in newspapers' discourse on reproductive and genetic ethics within the field of biotechnology. The field of biotechnology is widespread and covers a range of technical procedures. In this thesis the term is used to talk about medical biotechnology, or more precisely reproductive and genetic technology, the part of the field concerning itself with in vitro fertilization (IVF), preimplantation genetic diagnosis (PGD) and stem cell research.

The birth of the first *test-tube baby* in 1978, conceived through the use of IVF, was a major breakthrough for reproductive medicine and science as a whole. IVF is a process where the egg is fertilized by sperm in a petrie dish and 40 hours later injected in to the female body as an embryo. Since then the field has continued to develop. The year 2000 marked the birth of what has been termed the first *designer baby* or *savior sibling*. The technology behind this event is known as PGD or embryo screening and is an addition to IVF. The procedure entails removing a single cell from an embryo to look at its DNA structure to check for any abnormal structures that could cause disease or disability. The possible disease carrying gene is located and embryos that harbor the gene are discarded, whilst the so called *healthy* embryos are implanted into the female body. It is now becoming possible to screen not only for hereditary diseases but also for downs syndrome, various types of cancer, dwarfism, and even gender. As this technology develops and provides us with more and more possibilities for looking into a child's future health and genetic makeup is feared that the technique will not only be used for medical reasons, but also eventually to create *made to order* babies.

As we know that metaphorical patterns in vocabulary and grammar are important for representing and shaping ideologies and social practices (Goatley 2007: 2), metaphor also becomes central to biotechnology and bioethical discourse. As discussed above, metaphor is used in discourse as a way of framing and highlights some aspects whilst hiding others, a practice that in turn is affected by the ideological standing of the authors of the individual paper. The research questions used in this thesis to investigate the use of metaphor in media's discourse of biotechnology are as follows:

a) What kind of conceptual metaphors are applied to describe BABY, MOTHER, PREGNANCY, the biotechnical PROCEDURE/ FIELD and the DEBATE?

b) How, and to what degree, do the metaphors of the debate differ, depending on the newspapers political orientation/ the newspapers ideology? And how, and to what degree are they similar?

c) How can the choice of metaphor affect the image projected of BABY, MOTHER, PREGNANCY, the biotechnical PROCEDURE/ FIELD and the DEBATE?

The study is corpus based and consists of metaphor tokens from six daily American newspapers from 29 August 2000, the date the first *donor* or *designer baby,* Adam Nash, was born, up until today. Adam Nash was born to save an older sibling, who suffered from a genetically inheritable disease. His mother underwent in vitro fertilization and preimplantation genetic diagnosis to select an embryo that would not be a carrier of the disease-causing gene, and hence could act as a stem cell donor for his sibling (Nerlich et al 2003: 471). This event stirred debate and brought up some fresh ethical questions regarding the further development of the field of biotechnology, its limitations, or lack of limitations and the scenario of a slippery-slope (see theory chapter section on slippery-slope metaphors). As this occurred in the United States, it is thus interesting to look at how reproductive ethics are discussed and portrayed in the American news media from this period up until today.

The thesis starts with a brief introduction to the theories applied and their relevance to the research questions. Then the material and method used in the study are presented before the results found in the analysis are presented and discussed. As is accepted practice in cognitive linguistics, I will use upper case when referring to the cognitive entities that underlie metaphor - the conceptual metaphors. For example ARGUMENT IS WAR in which WAR is the source domain and ARGUMENT is the target domain. IS is used to symbolize the ongoing process of mapping. Italics are used to mark words or phrases that are used metaphorically. All tokens are numbered, and the number corresponds to the token's entry in SPSS.[1]

This thesis is concerned with the linguistic manifestations of ideology regarding biotechnology and the ethical issues surrounding the field as they are discussed and presented in the news media, and will not discuss in any detail the scientific facts on the subject of reproductive and genetic technology. The aim of the thesis is to examine what types of metaphorical domains are chosen by newspapers in their discourse on biotechnology and bioethics, and further whether this choice can be said to be dependent on the political orientation of the newspaper.

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[1] All the metaphorical tokens are given a reference number that corresponds to the token's entry in SPSS. A list of the tokens is available upon request.

2. THEORY

The aim of this thesis is to look at how metaphorical mappings support and sustain ideology in newspaper discourse regarding biotechnology and bioethical issues. My hypothesis is that the choice of conceptual domains in cross-domain mappings applied in newspaper articles is connected to the political orientation of the newspaper. This chapter presents the theoretical foundation of the thesis and consists of four sections. The first section, 2.1, gives an account of the theory of cognitive metaphor within the branch of cognitive linguistics. Section 2.2 gives a brief introduction to ideology and demonstrates how it can be linked to metaphor and newspaper discourse. Section 2.3 draws some lines between metaphor, ethics and biology and section 2.4 presents some comparable studies and positions my work within the field.

2.1. Cognitive Metaphor Theory

Cognitive metaphor theory (henceforth, referred to as CMT) was introduced within the field of cognitive linguistics in 1980, as George Lakoff and Mark Johnson published their book *Metaphors we live by.* The theory holds that metaphor is not merely a figurative expression or device, but that it is essential to the way we understand the world around us, and that our conceptual system, in terms of which we both think and act, is mainly based on metaphorical structures (Lakoff and Johnson 2003: 3). In the words of Mark Johnson, metaphor is '[…] a pervasive, indispensable structure of human understanding by means of which we figuratively comprehend our world' (Johnson 1987: xx). Hence, as opposed to earlier theories on the function of metaphor, metaphor within the field of cognitive linguistics is understood as being '[…] primarily a matter of thought and action and only derivatively a matter of language' (Lakoff and Johnson 2003: 153). Consequently, although metaphor is sometimes expressed through the use of language, it is not exclusively a linguistic manifestation. It is first and foremost a cognitive phenomenon with various expressions. Lakoff and Johnson term metaphors mental mechanisms and stress that metaphors should not be confused with their representation, be it linguistic expressions, gestures or non-verbal communication. Further, they point to the fact that metaphors are often not verbalized, but simply serve as a motivational source for our behavior (2003: 156-158). According to Forceville, in the article *Metaphor in pictures and multimodal representations,* the assumption that metaphors are essential to thinking clearly indicates that the occurrence of metaphor should not be regarded as restricted to language activity, but rather be seen as a phenomenon that has a variety of expressions, such as for example static and moving pictures, sounds, music, gestures, and

even touch and smell (Forceville 2008: 462-463).

The essence of metaphor is understanding one thing in terms of another, and it can be defined as '[T]he cognitive mechanism whereby one experiential domain is partially 'mapped', i.e. projected, onto a different experiential domain, so that the second domain is partially understood in terms of the first one' (Barcelona 2003b: 3, author's emphasis). The relationship between the two domains is typically expressed as X IS Y. For instance, time can be understood in terms of motion, in the expression 'Time *flies'* or as a commodity in 'We are *running out of* time'. Here we have the conceptual metaphors TIME IS MOTION and TIME IS A COMMODITY, in which *flies* and *running out of* are the source domains and *time* is the target domain. The cognitive linguist Antonio Barcelona applies the terms *source* or *donor* domain for the domain that is mapped and *target* or *recipient* domain for the domain onto which the source is mapped, i.e. the domain the source is being used to say something about. In this thesis I will be applying the terms *source* and *target* domain.

The notion of the *domain* is central to cognitive theory and to the theory of metaphor. To explain what a domain is, it is useful to first define the notion of a *concept* within the theory of conceptual metaphor. A concept is '[…] a basic unit of mental representation' (Clausner and Croft 2006: 2), and can be categories such as for example *food* or *happiness*, or individuals such as *President Barack Obama* or the *Dalai Lama.* These concepts are not isolated occurrences, but are embedded in a deeper knowledge structure; that is, they can only be understood in the context of our presupposed background knowledge structures. It is these structures that are referred to as domains. The relationship between the concept and the domain is described by Clausner and Croft as a relationship between a part and the whole. To exemplify this they draw on the cognitive linguist Langacker's example of a CIRCLE, an ARC and a CHORD, in which the CIRCLE is the domain that the concepts ARC and CHORD presuppose and are understood in the context of (2006: 5-6). Without knowledge of the CIRCLE domain one cannot understand the concepts ARC and CHORD. Moreover, in a 2002 article by Croft he writes that, typically, a domain is the base that several concepts are understood in relations to. It is in fact this that makes it a domain, and a domain can thus be defined as '[…] a semantic structure that functions as the base for at least one concept profile (typically, many profiles)' (Croft 2002: 166). As we shall see later in this chapter it is the fact that a certain domain is the base for several metaphorical concepts that contributes to metaphors' conventionality and pervasive quality, and which enables us to easily understand larger metaphorical scenarios.

Central to the CMT is the idea that the cross-domain mapping of concrete source

domains to abstract target domains does not take place randomly but falls into certain patterns, or broader metaphorical themes (Goatly 2007: 15). Domains are realized at different levels based on taxonomic relations, there are *superordinate* domains and *subordinate* domains. This can be exemplified by the conceptual metaphors PROBLEMS ARE OBSTACLES, STATES ARE LOCATIONS and PEOPLE ARE TRAVELERS, which are all subordinate domains to the superordinate domain LIFE IS A JOURNEY. Yet another example is the phrase 'We are *going our separate ways*' which conceptualizes LOVE as a JOURNEY and falls within the superordinate metaphorical domain JOURNEY, which is highly pervasive and conventional in the English language. Since the concrete source domain JOURNEY is often involved in diverse conceptualizations of abstract target domains, we are used to thinking about JOURNEY as a conceptualization of various target domains. This entails that we quickly pick up and understand the reference, or mapping, in metaphors involving the superordinate metaphorical theme of JOURNEY. The fact that conceptual metaphors are arranged in this type of pattern contributes to their pervasive quality and makes them efficient discourse tools. I will be applying the terms *main metaphorical source domain* and *main metaphorical target domain* when I discuss the superordinate domains and the term *sub-domain* when I discuss the subordinate domains.

In the article *Metaphor scenarios in public discourse* Andreas Musolff examines how source concepts can be organized into, what he terms, metaphorical scenarios. He suggests that many of the subordinate domains within a main metaphorical domain function together to create *mini-narratives* (2006: 23-28). The idea of a metaphorical scenario or mini-narrative entails that a main metaphorical domain such as JOURNEY contains many sub-domains or sub-mappings that separately construct different aspects of the JOURNEY domain. These aspects can for example be travelers on the journey, modes of travelling, destinations, locations, etc. Together these sub-domains form a metaphor scenario that creates a more complete understanding of the main metaphorical domain JOURNEY. Musolff defines scenario as '[…] a set of assumptions made by competent members of a discourse community about 'typical' aspects about a source situation […]' (2006: 28, author's emphasis). The author suggests that it is at this level, the scenario level, it is possible to discover attitudinal bias and preferences within the discourse communities, because scenarios are rich conceptual structures that can easily be exploited for their rhetorical powers.

Another key element to the metaphorical process is the *experiential domain*, but exactly what is an experiential domain? Cognitive linguists define it as *blocks* of information that structure our knowledge and experience and create the foundation for linguistic meaning

(Barcelona 2003a: 32). In other words experiential domains are the basis of our conceptual domains. These structured *blocks* of knowledge and experience are constructed from image schematic structures which are created through early bodily infant experience. These schemas are numerous and diverse, and are learnt from a very early age. For instance, already as we are in the womb the sensation of space to move, or the lack of it, provides the source for, among others, the conceptual metaphor FREEDOM IS SPACE TO MOVE. From the practice of eating and excreting we experience our bodies as containers with insides, outsides and surfaces, which provide the source for MIND IS A CONTAINER. We learn that UNDERSTAND IS HOLD/GRASP and that CONTROL IS HANDLE as we acquire the ability to handle and manipulate objects, and gradually gain more and more control of our hands and fingers. (Goatly 2007: 15).

The fact that experiential domains like these are created through gathering of information about the world based on early bodily experiences entails that the size and content of experiential domains may differ from person to person. Hence, the use of, and interpretation of metaphors are not universal and may vary between people and cultures. However, there are some metaphors that can be said to be more or less common across cultures, and that is metaphors that have their basis in our bodies and bodily functions. This because these concepts are not culturally dependent; rather they are common to all human beings. An example of this is orientational metaphors such as 'I'm feeling *up*', 'My spirits *rose*' and 'He *sank* into a coma' (Lakoff and Johnson 2003: 15). People across cultures can relate to these orientational based metaphorical concepts because they are based on bodily experiences. An erect or upright body is conceived as a conscious, awake, healthy and living body, and therefore the concept *up* is regarded as positive metaphorically. A body that is lying down is conceived as unconscious, sleeping, sick or dead and therefore *down* is regarded as negative metaphorically. Another example is metaphors for emotion, which also are more or less universal and common to human beings across cultures; such as 'She was *scarlet with annoyance*', 'A *warm* welcome' and 'To *blow ones top*' (Knowles and Moon 2006: 38-39). But see also Yu 2008 on the relationship between metaphor and culture.

The ongoing process of metaphoricity, understanding the source domain in terms of the target domain, is known as conceptual mapping, and the domains that are involved in cross-domain mapping, source and target, have some typical characteristics. According to Semino:

> […] target domains typically correspond to areas of experience that are relatively abstract, complex, unfamiliar, subjective or poorly delineated, such as time, emotion, life or death. In contrast, source domains typically correspond to concrete, simple, familiar, physical and well- delineated experiences, such as motion, bodily phenomena, physical objects and so on (2008: 6).

The previously mentioned examples of TIME IS A COMMODITY and TIME IS MOTION are examples of this. This is also the case in the well- known construction of ARGUMENT as WAR, in which the abstract and poorly delineated concept of *argument* is thought about, talked about and structured in the same way as the much more clearly delineated concept *war* (Lakoff and Johnson 2003: 4). This is the background for the conceptual metaphor ARGUMENT IS WAR, which is reflected in everyday expressions such as:

He *attacked* every weak point in my argument.

His criticisms were *right on target*.

If you use that *strategy*, he'll *wipe you out* (Lakoff and Johnson 2003: 4).

In this process of mapping, features from the source domain are mapped onto the target domain, and we comprehend the target in terms of the inherent qualities of the source. It is important to note that the mapping is only partial; a metaphorical mapping does not involve a complete correspondence between two conceptual domains. The verbal activity of *argument* is not the same as the physical activity of *war*. In the ARGUMENT IS WAR metaphor some features such as attacking, defending, aiming and the use of strategy are mapped from the experiential domain of WAR onto the experiential domain of ARGUMENT. Yet, other features such as the use of weapons and physical injury are not mapped from source to target. Hence, the metaphor highlights certain aspects of the source domain, and hides others. This effect of highlighting and hiding qualities is one of the reasons why metaphor is such a powerful rhetorical device. Highlighting some features while hiding others is a type of framing that might limit our imagination by directing our thought along certain paths and away from others (Petersen 2005: 204).

Another feature essential to conceptual metaphor is that it is unidirectional (Barcelona 2003: 6-7). This means that only qualities from the source domain are mapped on to the target domain, and not the other way around. In the conceptual metaphor ARGUMENT IS WAR it is parts of the domain of war (source) that are mapped on to the domain of argument (target). Other parts of the war domain are not constructed as an argument. The conceptual metaphor PEOPLE ARE MACHINES can serve as an example to demonstrate the unidirectional quality of metaphor. In this metaphor MACHINE is the source domain and PEOPLE the target domain.

Some of the inherent qualities of MACHINE, such as being productive, precise and mechanical can be mapped onto PEOPLE, but qualities of PEOPLE, such as walking on two feet, talking, and being civilized are not mapped onto the MACHINE domain. However, this does not mean that there is no metaphor that conceptualizes MACHINE as PEOPLE (Barcelona 2003b: 7).

Some metaphors are a natural part of our everyday language to such a degree that they can be hard to identify or even notice. The reason for this is that they have become *conventional* to our language. This involves that the distinction between the metaphorical meaning of the word and its basic meaning has become unclear, and in many cases the lexeme's metaphorical meaning is taken to be its basic meaning. Lexemes that have lost their metaphorical meaning all together and are rendered obsolete are termed *historical* or *dead* metaphors (Deignan 2005: 138-139). That a metaphor is conventionalized does not in any way diminish its effect on cognition, on the contrary, a conventionalized metaphor has the ideological advantage of appearing to be the *natural* way of expressing something. 'The relative ease with which conventional metaphors and literal language are processed suggests the possibility for considerable latent ideological effects' (Goatly 2007: 22). Hence, conventional metaphors can be a powerful device in discourse, because they are not conceived of as metaphors they have the potential of affecting and shaping beliefs and actions without being recognized as a rhetorical device.

Novel metaphor, or *creative* metaphor as it is sometimes termed, is easier to recognize because it is, as the term suggests, innovative and new. It does not blend in in everyday language to the same degree as a conventional metaphor. A novel metaphor can be coined by drawing on a conventional metaphor but using different and new mappings from source to target domain. In the previously mentioned metaphor 'Time *flies*' which is a sub-domain of the conceptual metaphor TIME IS MOTION, '*flies*' is used to describe the movement of time. A novel mapping within this domain could be 'Time *sprints*' or 'Time *swims* by so fast!' Both of these statements are as valid as 'Time flies' when it comes to expressing the movement of time, however they are not equally common or as conventional as the first statement, and hence would command more thought processes and interpretation from listeners. This would cause the listener to be more conscious of the words that are used, and thus a novel metaphor is much more likely to be identified as a metaphor than a conventional one.

2.2 Ideology

The term ideology was coined by the French enlightenment aristocrat and philosopher Destutt de Tracy more than two hundred years ago and was defined as the science of ideas. Today there exist a number of possible definitions of the term and they can mainly be divided into two categories. Charteris-Black categorizes definitions of ideology by whether they carry a negative or a neutral meaning. He summarizes the negative sense as 'false consciousness', as coined by Friedrich Engels in 1893 (Decker 2004: 7), and the neutral sense as 'a comprehensive and coherent social perception of the world' (Charteris-Black 2005: 21). Whilst the neutral sense denotes any world view or perception of the world as an ideology, the negative sense is exclusively used to describe perceptions of the world that are held by *the others* and perceived of as negative and perhaps also harmful.

In the 2004 article *Communicating ideology,* Pütz et al hold that the term *false consciousness* used about ideology implies that there is also such a thing as *true consciousness*. Therefore, ideology has often been contrasted with knowledge, and thus negatively evaluated. This negative notion of ideology, in the term of false consciousness, is then attributed to the ideological *others*, creating a polarization between the out group ideology and the in group knowledge. As a result, some perceptions of the world, such as for example sexism and militarism are typically referred to as ideologies, whilst others like feminism and pacifism are not. This polarization between ideology and knowledge has persisted up until today and dominated the theory of ideology. Pütz et al deem the classical theory of ideology flawed and state that it is necessary to apply the term in a neutral sense, as a way to describe all systems of ideas of any social group or class (Pütz et al 2004: xiii- xiv). In this thesis the term is applied in the neutral sense, relating to the beliefs, opinions, attitudes and actions, of both individuals and groups of people, which make up their social perception of the world. I would like to use Van Dijk's definition of the term, in which ideology can be said to: '[…] allow people, as group members, to organize the multitude of social beliefs about what is the case, good or bad, right or wrong, for them, and to act accordingly' (1998: 8).

This definition however, does not exclude the notion of power from ideology. The notion of power is essential to ideology and may function as a major influence on the development of a group's ideology because the group can only maintain or achieve what they consider valuable and important through exercising power over other groups, as well as resisting other groups' attempt to exercise power over them (Goatly 2007: 1). One way of

exercising power is through language, and as we know that metaphor is essential to language in general, and also a vital rhetorical device, it is thus also reasonable to assume that metaphor is equally important to the communication of ideology. This notion is supported by Goatly who, as mentioned in section 2.1., tresses the role of conventional metaphor as a conveyer of hidden or latent ideology. It is important to be aware of how conventional metaphors are applied by people, groups and institutions who hold powerful positions in society because, as Goatly puts it: '[…] the influence of language upon our thought and perception of reality is most powerful when we are unaware of it, when it expresses hidden or, technically speaking, *latent* ideology' (2007: 27, author's emphasis).

One institution, which holds great power in our modern society, and which is well known for its use of cross-domain mappings is the news media. Looking at how newspapers manifest their ideology in media debate through the use of various metaphorical source and target domains, I hope to show that cognitive metaphors are important in creating and conveying ideology. Moreover, I hope to establish whether or not there is a difference in the metaphorical domains used to create and sustain different ideological beliefs.

There are some fields within linguistics that aim at investigating the connection between ideology and the notion of power. One such field is the interdisciplinary field of critical discourse analysis (henceforth, referred to as CDA). CDA is concerned with investigating critically how language use is part of expressing, legitimizing, and constituting social inequality. In other words, the objective of CDA is to uncover ideology as it is used textually to sustain or create inequality in society (Goatly 2007: 2-3). Another discipline interested with power relations and ideology constituted in language is critical metaphor analysis (henceforth, referred to as CMA). As the name suggests, CMA is concerned with the importance of metaphorical constructions for shaping ideologies, and thus also social practices, through the use of English vocabulary and grammar. Common to these disciplines is the belief that language is not simply a medium through which our thoughts are expressed and conveyed to others, but that it shapes the way we think and consequently also our action. Recently, these two disciplines have started to come together to investigate the ideological effects of metaphor (Goatly 2007: 2-3).

If the language we use, what we say and how we say it, plays a vital role in shaping human thought processes and practices, in other words; ideologies, and we know that the process of metaphor is pervasive in everyday language and essential to the way we think and act, then consequently, metaphor must be considered an important device in creating and sustaining ideology. For instance the use of conventional metaphor in the discussion of a

topic, for example biotechnology, will naturally affect the way the topic is conceived. Hence, a conscious speaker or writer could employ metaphors to achieve certain desired effects to create and sustain ideology favorable to him/her.

2.3 Metaphor, biotechnology and ethics

The field of biotechnology is developing at a rapid pace, too rapid, some might say. New innovative techniques and procedures that allow us to control more and more aspects of not only our own lives, but also the lives of our offspring, are continuously emerging. These procedures and techniques can prolong and better our lives, and even enable us to make decisions regarding the genetic make-up of our children. Diverse methods of reproductive technology, gene testing and gene therapy such as PGD, IVF and the use of stem cells opens up for the possibility of *creating* children with carefully selected features, and even the possibility or *producing* children with the specific purpose of being a genetic match to a sick sibling. Technological advance brings about the possibility to treat and prevent diseases, especially genetically hereditary. This development is seen by proponents as a possible solution to many medical issues, and a way of saving lives. Opponents on the other hand, see the development as a threshold to a society where some lives are sacrificed in order to save others, and possibly also the start of a genetically stratified community.

Because the field is developing so fast, there is a continuous flow of new information regarding recently developed procedures, results of these procedures and the potential consequences the development can have on our society and our everyday life as 'consumers' of this new technology. This information is, naturally, conveyed through the use of language. Although the language of science is often seen as straight forward, neutral and factual, this is far from the case. Biotechnology and scientific discourse in general, is rich with metaphors, they are both pervasive and essential to the field (Semino 2008: 131). Metaphors are essential to science as a language of communication with lay people. It is a way of conveying complex abstract phenomena and processes by making it more concrete and understandable through conceptualizations based in our experiences (Petersen 2005: 204). Media adopts the language of science when discussing science. In biotechnology, and the news media's discourse of biotechnology, metaphors are used not only to explain abstract phenomena and processes, but also to express hopes and fears regarding the development of the field.

Goatly states that the use of metaphor in biotechnology has some disturbing aspects (2007, 93). More precisely, he suggests that the metaphors used might have a troubling effect on the way we think and talk about human beings in relations to biotechnology. In his book,

Washing the brain. Metaphor and hidden ideology the author claims that, especially within the field of genetics and human reproduction, there is an ongoing commodification of human beings taking place. This commodification is created through the use of cross-domain mappings of non-human qualities to human beings, the body, the mind and genetic material, and is revealed through metaphors such as, for example, HUMAN IS A MACHINE or HUMAN IS A PRODUCT (2007: 90-117). These types of conceptualizations affect the way we conceive of human beings because they involve a de-humanization that reduces human beings to objects or commodities. Thinking of human beings as machines within the field of biotechnology entails that stem cell research for example is seen as a way of *producing spare parts* for people who needs to *replace* some *parts* of their *machinery* because it is *defective.* Moreover, in the process of IVF and PGD the woman or the process itself may be conceptualized as a *machine* that is *producing* a child, in which the child is considered a *product*.

The field of biotechnology is ripe with metaphor. Some commonly applied ones are THRESHOLD, BLUEPRINT, THE BOOK OF LIFE and CODE. One of the most frequently conceptualized THRESHOLD metaphors is the SLIPPERY SLOPE metaphor, which is an expression of the fear that the development of the field is moving too fast and that it will outrun the debate regarding the moral, ethical and social consequences of such a development. In short, the SLIPPERY SLOPE consists of two scenarios, the *instant case* and the undesirable *danger case* (McGleenan 1995: 350-351). Allowing the instant case, which in itself might not be seen as dangerous, will inevitably lead to the undesirable danger case because there is no clear line or logical difference between the two cases. Following the logic of the slippery slope, many opponents of IVF, PGD and stem cell treatment believe that allowing these technologies inevitably leads to allowing other undesired technologies, because there is no knowing where to draw the line (McGleenan 1995: 350-351). An example is that allowing stem cell research now may eventually lead to cloning, and because cloning is morally unacceptable, we should not allow stem cell research in the first place.

Other sub-mappings within the THRESHOLD metaphor are similar to the slippery slope metaphor; they use crossing thresholds, lines and opening doors as a way of conceptualizing possible dangers that might follow from a specific action. BLUEPRINT, BOOK OF LIFE and CODE metaphors are frequently used within the field to conceptualize our genes as determining human characteristics. Our genes and DNA are conceptualized as holding the code to how our lives will turn out, or being a book in which it is possible to read our genetic future, almost like a manual. Only by breaking the code are we able to change

some of those inherent characteristics of our genes. Together these metaphors have been argued to be both deterministic and discriminatory because they involve a likening of people to their genes. Hence, people are categorized based on criteria they have no control and no real influence over (Condit 1999: 171).

In the introduction of this thesis it was argued that the rapid development of biotechnology may cause a moral void because the development of the field is racing ahead of our ability to deal with the new moral and ethical dilemmas that are raised. The presence of metaphor in biotechnology is relevant also in relation to ethical questions because the process of highlighting and hiding of features includes evaluation and valuation. This may be evaluations of what is good, bad, right or wrong and valuation of people's worth, beliefs, situations, religions etc. Anything that can be discussed can potentially be evaluated and valued through the use of metaphor in language. An example of this is the conflicting language used in the ongoing debate in American society of whether or not abortion should be self-determined. Pro-choice activists and pro-life activists choose dissimilar wordings to refer to the same concepts. The choice of words is not random; it is a careful selection of one term amongst many possible terms based on the assumption that some terms are more suitable for eliciting certain feelings and reactions. The term *embryo* does not evoke the same associations as the term *baby*. Whilst the first brings to mind cell matter at an early stage of development, and does not create associations to the child in the making as a person, the latter brings about thoughts of advanced development, personality and the right to life. Moreover, the type of conceptualizations chosen to talk about these concepts further contributes to highlighting some features, and consequently hiding others.

2.4 Comparable studies

This thesis was inspired by Andrew Goatly's *Washing the brain, metaphor and hidden ideology* (2007). Also, Alan Petersen's article *The metaphor of risk: Biotechnology in the news* (2005), and Alan Petersen, Alison Anderson and Stuart Allen's *Science fiction/science fact: medical genetics in the news stories* (2005), were part of the motivation behind writing this thesis. Goatly's work is positioned within critical metaphor analysis and attempts to bring together cognitive linguistics with critical discourse analysis. The book connects conceptual metaphor to the creation of power relations through the use of hidden ideology, and demonstrates how the use of certain types of metaphor constructs our reality, among others in the fields of medicine and biotechnology. The author especially emphasizes that within the field of biotechnology there is a great number of metaphors used to dehumanize human

beings, and an increasing trend of commodification. Petersen and Petersen et al.'s articles are oriented towards the media's role in framing the discourse of biotechnology through the use of science fiction narratives and metaphors. Petersen sees metaphor as crucial to the communication of science, and to how scientific issues are portrayed and states that '[…] use [of metaphors] may also limit the imagination and have consequences unforeseen. They [metaphors] may serve to direct attention along certain avenues and away from others […]' (2005: 204). The author calls for more research into the field. He suggests examining the role of metaphor in connection to political purposes in media's discourse of biotechnology. This could provide more insight into how metaphors work, who uses them and also the purpose behind the choice of metaphor and its potential effects (2005: 207).

Another contribution to the field, that I will look to in the discussion of my results, is Miltos Liakopoulos' *Pandora's Box or panacea? Using metaphors to create the public representations of biotechnology* (2002). Liakopoulos' paper addresses how metaphor is used in leading newspapers in the United Kingdom to create representations of biotechnology. The paper is based on the author's PhD thesis and looks at three main phases of technological development at different time periods, i.e. the 1970's, 1980's and 1990's, with the aim of analyzing the media's reporting of the debate systematically and thus covering the history of biotechnology so far. The author writes that the questions brought on by the biotechnological development, such as health risks, moral obligations and social consequences, have caused the field to be a social phenomenon, as opposed to a purely scientific one. Since the language of the field is highly technical and often does not connect with the target audience, metaphor plays an important role in the communication of biotechnology. He thus finds it interesting to examine how the field is conceptualized in cross-domain mappings. Liakopoulos' focus is on the type of metaphorical domains used, rather than on their frequency, and evaluates whether the choice of metaphor represents the field as positive or negative, and if the metaphor is used as a means of popularizing of the field.

This thesis is grounded in cognitive metaphor theory, but will also take into account the theory of critical metaphor analysis. The discussion of results in section 4.2 will contain elements of CMA, especially in the discussion of research question c; how the choice of metaphor in the corpus can affect the image projected of the target domains investigated. The thesis builds on both Goatly, Petersen and Petersen et al.'s theories and aims to bring the two together in an attempt to consider both the type of metaphors used in media texts on biotechnology and bioethics, as well as the potential effect of that choice, and to examine

whether there is a possible connection between the political orientation of a newspaper and the choice of metaphor.

3. METHODOLOGY

This chapter presents the material studied and the methods applied to examine this. The data is a collection of 30 newspaper articles from American newspapers that has been assembled in the period 25 January 2012 to 31 January 2012. The material is used in a combined quantitative and qualitative analysis to explore the notion that there is a link between newspapers' political orientation and their choice of source and target domains for cross-domain mappings in articles concerning biotechnology and bioethics. The chapter consists of three sections. Section 3.1 presents the work of compiling the corpus, whilst section 3.2 presents the method of analysis chosen and how the analysis was carried out. The last section, 3.3, looks into some of the aspects that need to be taken into consideration when a metaphor approach is applied to examine newspapers' ideology.

3.1 A corpus approach to metaphor

To investigate the occurrence and effect of metaphor in real language one has to look at authentic language in use and the best way to do so is to base the research on a collection of naturally occurring language, a corpus. However, the use of corpus linguistics to study metaphor is a fairly new approach to Conceptual Metaphor Theory. Traditionally, scholars, such as Lakoff and Johnson in the 1980's, studied metaphor through the use of intuition and introspection, creating their own examples to illustrate the use of metaphor as opposed to studying its occurrence in authentic language. This caused the field to be subjected to criticism calling for a stronger empirical grounding of the methodology (McEnery and Hardie 2012: 186). As a result, metaphor scholars have in recent years sought to combine CMT with corpus data to ensure that research has a solid empirical foundation. Charles F. Meyer, Professor of applied linguistics at the University of Massachusetts, states the following:

> Even though descriptive/theoretical linguists and computational linguists use corpora for very different purposes, they share a common belief: that it is important to base one's analysis of language on real data – actual instances of speech or writing – rather than on data that are contrived or "made-up" (Meyer 2002: xiii).

He further suggests that 'In this sense, then, corpus linguistics is not a separate paradigm of linguistics but rather a methodology' (Meyer 2002: xiii). McEnery and Hardie also treat corpus linguistics as a methodology and hold that as a method of examining metaphor it can 'reveal patterns of use that are not straightforwardly predictable from a CMT account of the source domain, target domain and expressions involved' (McEnery and Hardie: 187). Clearly,

as a linguistic method, a corpus approach to applied linguistics is more reliable than the use of the intuitive introspection method, simply because it is based in real language. A corpus-based approach to the study of metaphor and ideology in newspaper articles was thus chosen in this thesis to complement CMT and to give the study a strong empirical footing. Hence, the thesis is built on authentic and verifiable empirical evidence and any theoretical claims regarding the outcome of the analysis can be tested and/ or used for further research within the field.

The term *corpora* is mainly used to describe large electronic samples of real world texts gathered by an automated process, such as the Corpus of Contemporary American English (COCA), Corpus of Historical American English (COHA) or the British National Corpus (BNC). I would therefore like to stress that in this thesis the term will be used to refer to my manually assembled, fairly small, sample of newspaper articles. The corpus is a sample corpus (McEnery and Hardie 2012: 8), meaning that the type of language in the corpus has been especially chosen for the particular purpose of answering my research questions. Hence, the corpus consists of a specific type of language (articles from American newspapers that deal exclusively with the field of biotechnology and bioethics) within a specific timeframe (20 August 2000 to 31 January 2012). The following sections, 3.1.1 and 3.1.2, present a detailed explanation of the criteria used for the selection of the newspapers and the corpus articles.

3.1.1 The newspapers

The background for choosing newspapers as the medium for investigating metaphor and ideology in biotechnology and bioethics is a small pilot study I conducted prior to writing the thesis. The pilot study looked at three newspaper articles, three scientific articles and three official reports issued by the U.S government regarding reproductive biotechnology and its implications. Of these three genres, newspaper articles emerged as the most potent genre for metaphor. Both regarding metaphor in general and the specific source domains that I wanted to study (MOTHER, BABY, PREGNANCY, the biotechnical PROCEDURE/ FIELD and the DEBATE) the newspaper articles displayed a higher metaphor frequency than the other text genres. Moreover, newspapers play an important part in shaping readers' attitudes and opinions, conscious as well as subconscious. The way in which biotechnology and its ethical implications are presented and debated in the media is thus influences the public perception of the debate.

As part of the aim of this thesis is to say something about how metaphorical source and target domains are linked to ideology in newspaper articles, the newspapers examined must be newspapers that can be said to represent a certain ideological standing or point of

view. In the article *What drives media slant? Evidence from U.S daily newspapers* (Gentzkow and Shapiro 2010) the authors examine a number of American newspapers with the intention of uncovering political slant in the papers' news coverage. They measure the political slant of a newspaper by comparing phrase frequencies of the newspapers with phrase frequencies in the 2005 Congressional Record. Based on this comparison they establish whether the newspaper's language reveals more similarity to that of a congressional Republican or a congressional Democrat. Their results were consistent with readers' subjective evaluations of newspapers' political slanting in a survey conducted by the Mondo Times, an American news media directory (2010: 4). Based on these results, Gentzkow and Shapiro present a cross tabulation of language-based and reader-submitted ratings of slant. The results from their cross tabulation functioned as one of the criterions for selecting newspapers for the corpus.

The newspapers examined were chosen on the basis of Gentzkow and Shapiro's measures of political slant combined with circulation figures. Circulation figures were also considered, because I wanted to make sure that the papers were comparable in size and the type of audience they addressed. Circulation figures often correlate with geographical distribution, the larger circulation figures, the larger the geographical area. Locally or regionally based newspapers might address and reach a different reader group than national newspapers and the language used might adapt accordingly. Hence I selected newspapers with similar circulation figures to make sure that the articles used in the analysis were comparable.

An additional feature considered was the degree of relevance a paper's articles showed to the metaphorical target domains investigated (BABY, MOTHER, PREGNANCY, the biotechnical PROCEDURE / FIELD and the DEBATE). Here, degree of relevance means that a search in the newspaper's archive had to include a certain number of articles or editorials that addressed topics relevant to the research question of the thesis to be included in the corpus. To establish degree of relevance I searched the web sites using the search words *preimplantation genetic diagnosis, in vitro fertilization*, *stem cell+ embryo, fetal+ genetics* and *baby+ reproductive technology*. *Fetal* and *baby* are quite commonly used lexemes, and searching them alone elicited too broad results. The lexemes were thus searched for in combination with *genetics* and *reproductive technology* in order to yield more relevant search results. Even though s*tem cell* is not as common as *baby* and *fetus,* searching it alone resulted in hits that were not directly relevant to the debate of reproductive ethics, for example articles dealing with stem cells used to cure diseases in adult individuals. The search word *stem cell* was therefore combined with *embryo*. If more than two search words generated fewer than three hits on a paper's web site, the paper was not used as a source for corpus articles. To sum up, I

wanted to study papers that could be said to display a certain degree of political slant; I wanted the papers to be of comparable size measured in circulation, and to contain news material relevant to my search criteria, as mentioned above.

The papers examined in the thesis are the *Wall Street Journal*, the *Washington Times*, the *Chicago Tribune*, the *New York Times*, the *Los Angeles Times* and the *Boston Globe*. The first three newspapers can be said to have a conservative political slant, and the latter three to have a liberal political slant (Gentzkow and Shapiro 2010). In Gentzkow and Shapiro's cross tabulation of language-based and reader-submitted ratings of slant the *New York Times*, the *Los Angeles Times* and the *Boston Globe* are considered to be well to the left of the *Washington Times* and the *Wall Street Journal*, which are among the newspapers found to be most to the right in the study. The *Chicago Tribune* is positioned slightly more to the left than the two other conservative papers. The newspapers' circulation figures grouped by political orientation are presented in table 3.1 below.

Table 3.1: Newspapers with circulation figures (per 10 November 2011) grouped by political orientation.

Poltitical orientation	Newspapers	Circulation figures
Conservative	*Wall Street Journal*	2 096 169
	Chicago Tribune	425 370
	Washington Times	93 763
Liberal	*New York Times*	1 150 589
	Los Angeles Times	572 998
	Boston Globe	205 939

(Mondo Times, accessed 10 November 2011)

All the papers are daily newspapers published seven days a week, with the exception of the *Wall Street Journal* which is only published six days a week. All the papers are amongst the most widely circulated newspapers in the U.S according to the Mondo Times news media directory. *The Wall Street Journal* and the *New York Times* are two of the top American newspapers in terms of readership and circulation; they are both daily newspapers in New York City, New York. The *Wall Street Journal* is one of the most widely read newspapers in the U.S and covers national and international business and financial news. It is owned by Dow

Jones & Company. Inc. and is one of the leading financial newspapers worldwide. The *New York Times* is owned by the New York Times Company and covers local news, sports, business, jobs and community events. The rest of the papers also cover the same material. The *Chicago Tribune* is owned by Tribune Publishing and is the principal daily newspaper of the Midwestern USA. The *Washington Times*, a daily newspaper in Washington D.C, is owned by News World Communications. Inc. *Los Angeles Times* is a daily newspaper in Los Angeles, California and is distributed throughout the western United States. The paper is owned by Tribune Publishing. The *Boston Globe* is a daily paper in Boston Massachusetts owned by the New York Times Company (Mondo Times, accessed 10 November 2011).

3.1.2 The articles

The data material was collected from the newspapers' web sites online by accessing the newspapers' archives directly or by using the function for advanced search. A complete overview of the websites is included in the reference list. For all the papers except the *Los Angeles Times* a subscription was necessary in order to search the archives at all, or in order to gain access to the articles in full text. Since the papers operate with different search engines it was not possible to employ the exact same search procedure for all the papers, but the it was kept as similar as possible. The newspapers' archives were searched with a custom date range, from 29 August 2000, the birthdate of the first *designer baby*, up to the date the search was made. The last search was completed on the 31 January 2012.

In the *Wall Street Journal's* archives it was only possible to search two years back in time, although the website had a function for advanced search. However, since all search results were sorted by relevance as opposed to date, and the paper in question yielded as many relevant results as the other papers this is not likely to skew the results of the analysis. Moreover, the articles that make up the final corpus display a similar date range across the political orientations (see later in this section and also appendix A). Both the conservative and the liberal articles range from 2001 to 2011.The conservative articles are slightly more evenly distributed throughout the 2000's than the liberals, with eight articles before 2005 and seven after, compared to the liberal three before 2005 and twelve after. I would also like to stress that he date range is only used as the sampling frame for the corpus and not a criterion for the analysis as such. As is explained further in the following paragraphs, it is relevance that is the prime criterion for selecting the newspaper articles.

The same search words that were used to find relevant newspapers, *PGD, IVF, stem cell+ embryo, fetal+ genetics* and *baby+ reproductive technology,* were used to elicit relevant

articles from the newspapers' archives online. Each search word or combination of search words was searched for independently. For each search word or combination of search words four occurrences from the result list were included in the corpus. All search results were sorted by relevance, naming the most relevant result at the top of the result list and the less relevant results further down. Nevertheless, there were still some appearances of articles on the result list that were not directly relevant to the aim of the thesis.

To ensure that the results were indeed relevant all articles that appeared on the search result list were therefore checked for theme relevance. This was done by converting the articles into word files and using the word search-function to count the number of times the search word(s) appeared in the article text. To be included in the corpus the article had to contain at least five occurrences of the search word. For the combined search words, occurrences of both words were counted and the combined figure had to exceed five. The singular search words IVF and PGD were entered both as the abbreviations and as the full words and the combined results had to exceed five occurrences for the article to be included in the corpus. This criterion was applied consistently to all the articles for all search word(s) until four articles were included in the corpus per search word(s) per newspaper. Article collections would occasionally appear as part of the result list for a search word; in these cases the first (relevant) article of the collection was included in the corpus. Hence, if an article collection was the first hit in a result list, one article was saved from the collection before the rest of the result list was checked for relevance and a total of four articles were saved.

As the aim of the thesis is to look at how metaphors are used to establish and sustain the ideology of newspapers, only feature and news articles and editorials were included in the corpus as they can be regarded as representing the papers' opinion and ideological beliefs. Blogs and readers' opinions were not included as they are considered to represent the readers' opinion and the ideology of an individual as opposed to the ideology of the newspaper. Mostly, it was possible to search for articles only, but in some papers blogs, book/theatre reviews, readers' opinions and advertisements were also included in the search results. In these cases these results were omitted from the corpus, the rest of the search results were checked for relevance as previously described, and a total of four articles were saved. Sometimes a search yielded fewer than four results, or fewer than four results were relevant according to the above mentioned criteria. In these cases only the relevant results were included; hence some papers have fewer than 20 articles in total.

The limited time frame of the thesis put its constraints on the analysis; it was not

possible to analyze all the articles that were sampled at this stage of the process. For that reason five articles from each paper, a total of 30 articles, were selected for metaphor analysis. The selection of the articles was done by ensuring that all articles of all papers were sorted in the same order according to the search words they had been elicited by. The articles were then chosen randomly by taking every third article from each paper until five articles had been chosen. Hence, the first, fourth, seventh, tenth and thirteenth article from each paper was chosen, making the total corpus count 30 articles and 49 456 words. A list of the corpus articles is included in appendix A.

Table 3.2: Words in the corpus grouped according to newspapers and political orientation.

Poltitical orientation	Newspapers	Words
Conservative	*Wall Street Journal*	6 084
	Chicago Tribune	6 877
	Washington Times	5 537
		18 498
Liberal	*New York Times*	7 851
	Los Angeles Times	15 508
	Boston Globe	7 599
		30 958
Word total		**49 456**

Of the total 49 456 words, the liberal newspapers made up 30 958 words, and the conservative newspapers 18 498 words of the corpora. An overview of words in the corpus shown per paper arranged according to political orientation is presented in table 3.2. As is evident from the numbers presented in the table the data is somewhat skewed towards the liberal newspapers. This is not considered a problem as the material will not be analyzed and discussed using raw frequencies but percentage distribution. Since the corpus consists of two parts, divided by political orientation, I will be referring to the parts as respectively the *liberal sub-corpus* and the *conservative sub-corpus*. When I discuss all the metaphorical tokens together I will use the term *combined corpus*. Although my corpus may be considered small compared to large-scale electronic corpora the sample is considered sufficiently large to allow

some generalizations to be made regarding how metaphor is linked to newspaper ideology.

Even though a strict procedure was followed to ensure only relevant articles were included in the corpus, the final corpus still ended up containing three articles that were less relevant to the aim of the thesis than the rest of the corpus articles. The articles are *A mother and child union* from the *Boston Globe* and *San Diego company studies stem cell implant as a type 1 diabetes treatment* and *Ovarian cancer risk increases after IVF* from the *Los Angeles Times*. These articles contained the required figure of search word occurrences, and were for that reason included in the corpus. However, they were somewhat off topic. An example is the article *Ovarian cancer risk increases after IVF* which was the tenth article sampled from the *Los Angeles Times*. The article discusses the use of IVF, but in the light of ovarian cancer, and how the risk of that type of cancer might increase after several IVF treatments. Not surprisingly, this article did not contain any metaphors relevant to the aim of the thesis and for that reason there are only metaphors sampled from four articles in the *Los Angeles Times*. The other two articles mentioned above did contain relevant metaphors (though slightly fewer than the other corpus articles) as regards MOTHER, BABY, PREGNANCY, the biotechnical PROCEDURE/ FIELD and the DEBATE and were thus sampled and included in the metaphor analysis.

3.2. The analysis

3.2.1 The Metaphor Identification Procedure

In CMT finding metaphor in cognitive processing involves identifying two activated conceptual domains in the data that are connected by a cross- domain mapping. Given that metaphors are conceptual phenomena that are expressed through linguistic manifestations in the form of cross-domain mappings, an attempt to label and categorize the metaphorical expressions needs to follow operational criteria that are precise and objective (Steen 2007: 74-75). Steen draws on the metaphor identification procedure (MIP) to identify metaphorically used words in natural discourse. The MIP is a procedure developed by the Pragglejaz group in 2007 (Steen 2007: 88) to provide a more precise definition of metaphorical expressions. The procedure helps differentiate the metaphorical meaning of a word, or a word chain, from its basic meaning. By applying the procedure, the analysis process is divided into clearly distinguished steps that allow for every moment of decision making to be defined precisely. Thus, every step of the procedure, every step of decision making, can be traced and singled out as a subject for debate if disagreement should arise about whether or not a lexical unit is used metaphorically (Steen 2007: 88). The MIP procedure involves four steps as follows:

1. Read the entire text-discourse to establish a general understanding of the meaning.

2. Determine the lexical units in the text-discourse.

3. a) For each lexical unit in the text, establish its meaning in context, that is, how it applies to an entity, relation or attribute in the situation evoked by the text (contextual meaning). Take into account what comes before and after the lexical unit.

   b) For each lexical unit, determine if it has a more basic contemporary meaning in other contexts than the one in the given text. For our purposes, basic meanings tend to be:

   - More concrete (what they evoke is easier to imagine, see, hear, feel, smell and taste);

   - Relate to bodily action;

   - More precise (as opposed to vague);

   - Historically older.

   Basic meanings are not necessarily the most frequent meanings of the lexical unit.

   c) If the lexical unit has a more basic current-contemporary meaning in other contexts than the given context, decide whether the contextual meaning contrasts with the basic meaning but can be understood in comparison with it.

4. If yes, mark the lexical unit as metaphorical.   (Semino 2008: 11-12)

I will be analyzing both single lexical units and multi-word expressions. I will apply the metaphor identification procedure according to its directions, but it has been somewhat altered to fit the aim of my analysis. As listed above, the third step of the MIP involves looking up all lexical units in a dictionary to establish metaphorical meaning; in my analysis however, I will not look up every single lexical unit. This is due to the size of the corpus. The objective of the analysis is divided into three and aims first at applying a qualitative analysis to establish what kind of conceptual metaphors are applied to describe BABY, MOTHER, PREGNANCY, the biotechnical PROCEDURE/ FIELD and the DEBATE. Secondly, the aim is to investigate how and to what degree the metaphors of the debate differ depending on the newspapers' political orientation. Last, but not least, the analysis aims at evaluating the metaphorical statements qualitatively to say something about how the choice of metaphor can affect the image projected of the source domains in question. To do this a fairly large number of articles (30) have to be analyzed. Given that my combined corpus consists of 49 456 words it would be difficult and quite time consuming to look up every lexical unit in a dictionary. The domains that I want to investigate are all nouns, and the articles to a large extent debate ongoing

processes and procedures, it is thus reasonable to expect that the lexemes that are potential carriers of metaphorical meaning also, to a certain degree, will be mostly verbs and nouns. Research on metaphoricity has shown that metaphorical expressions are often found to be verbs, nouns and sometimes adjectives; however, this depends on the type of metaphor. Orientational metaphors, for example, are likely to be expressed through the use of prepositions since they conceptualize things or people as containers with insides, outside and surfaces. In order to make sure that all types of metaphors are included in the analysis I will be looking at verbs, nouns, adjectives and prepositions.

Additionally, as the thesis examines the use of metaphors within the field of biotechnology and bioethics, only metaphors that deal with these issues are included in the analysis. As the articles that are included in the corpus, have all been carefully selected using search words from the field of biotechnology and bioethics, it is likely that most metaphors in the articles will indeed be found to be used to conceptualize some aspect of the fields.

The lexeme *fuel*, from the title of the corpus article *Embryos' creation adds fuel to stem cell debate* can serve as an example of how to establish whether or not a lexical unit is used metaphorically by applying the metaphor identification procedure. The article is taken from the *Chicago Tribune* and was published 25 January 2001. I am interested in defining the use of the lexical unit. In line with the MIP I start the process by reading the whole text to get a general understanding of meaning, which I gather to be the ethical and moral dilemmas surrounding the development of embryos made solely for the purpose of producing stem cells for the laboratory, compared to using so called *leftover* embryos from IVF treatment (step 1). Further, I determine the lexical unit that will be examined: *fuel* (step 2). Then, the contextual meaning of the lexeme is established, which I conclude to be to create further controversy in an already existing debate by adding controversial issues that cause dispute (step3a). Next, I examine if the lexeme has a more basic contemporary meaning than it has in the speech context. The first entry in the Oxford English Dictionary (OED) defines the meaning of the lexeme *fuel* as 'Material for burning, combustible matter as used in fires, etc.,' (Oxford English Dictionary, accessed 10 March 2012). This definition of the lexeme relates to the physical and quantifiable material used to fuel a fire, such as logs of wood and twigs. It is something concrete and tangible; hence this entry of the word appears to be more basic than the way it is used in the article (step 3b). As the lexeme is found to have a basic meaning different from the contextual meaning, I examine whether the contextual meaning can be understood in comparison with the basic meaning. The tangible and quantifiable material that is used to make and sustain a fire is a clear contrast to the more abstract and complex notion

of creating added controversy by introducing conflict-ridden issues to an already heated debate. However, the notion of a debate that grows and increases due to something that is introduced or added can be understood in terms of the process of physically adding fuel to a fire, and thus increasing the fire (step 3c). As previously mentioned this captures the essence of metaphoricity: to comprehend one thing in terms of another. I therefore draw the conclusion that the lexical unit *fuel* is used metaphorically in the article (step 4).

Having analyzed the texts and established what kind of lexical units function as metaphors, I proceed to identify the underlying conceptual metaphor by identifying the source domain and the target domain it is mapped on to. For example the conceptual metaphor for 'Embryos' creation adds *fuel* to stem cell debate' could be DEBATE IS FIRE, the abstract notion of a DEBATE being the target domain and the more concrete and tangible FIRE being the source domain.

The metaphorical tokens were coded at two levels, the superordinate level and the subordinate level (see section 2.1). Tokens were first identified by applying the MIP, and then grouped according to source domain, target domain and the main metaphorical domains (see section 3.2.2). Grouping of the sub-mappings into main metaphorical domains involves identifying the superordinate metaphor that is common to the sub-mappings by taking into consideration their patterns of collocation. The cross-domain mapping DEBATE IS FIRE , that was used in the example above, was grouped under the main metaphorical source domain FIRE, together with other metaphors that also belonged to the main metaphorical domain FIRE. The examples below illustrate the sub-mappings found within this main metaphorical domain. Each example is given a reference number in brackets that corresponds to the numbers entry in SPSS.

[1] […] the first 'test-tube' baby *ignited* controversy (12). TEST-TUBE BABY IS A MATCH.

[2] […] it is likely to *spark* controversy […] (19). STEM CELL RESEARCH IS A MATCH.

[3] […] the agency is investigating the *explosion* of home genetic tests […] (230). INCREASE IN USE IS EXPLOSION.

[4] Stem cells are the *fire hydrants* that stop the system from *burning* itself up (298). CELLS ARE FIRE HYDRANTS.

[5] Embryos' creation adds *fuel* to stem cell debate (425). PGD IS FUEL.

[6] The uncertainty of federal funding, which *fuels* academic research […] (453). MONEY IS FUEL.

As can be seen in examples [1]-[6] given above, there is a degree of variation between the sub-mappings, but it is evident that they also share some common traits. They are not completely unrelated domains. While it is clear that the sub-mappings MATCH, EXPLOSION, FIRE HYDRANT and FUEL share common traits, it is equally clear that none of them are subordinate to the others. That is, FUEL, for example, is not a subordinate domain to MATCH, EXPLOSION or FIRE HYDRANTS. Hence, it is something outside of the domains, a common denominator that links them together. In this case the common denominator is that all the domains have something to do with fire. Hence, they are subordinate to the superordinate domain FIRE.

I use the Oxford English Dictionary to define the meaning of lexemes and to further establish metaphoricity. The OED is a historical dictionary that sorts meaning of words chronologically according to when they were first recorded in the English language, as opposed to corpus based dictionaries that list the various definitions based on their frequency in the corpus. Thus, in corpus based dictionaries the most frequent meaning is listed first; the second most frequent meaning of the word follows etc. This can make it difficult to establish metaphoricity, since, in some cases the most frequently used meaning is not the most basic meaning (Semino 2008: 12), and it is the most basic meaning that needs to be established in order to discover possible contextual contrasts to the way the lexeme is used in a text-discourse. As mentioned above in step four of the MIP procedure, Semino terms a more basic meaning as a meaning that tends to be more concrete (what they evoke is easier to imagine, see, hear, feel, smell and taste), related to bodily action, more precise (as opposed to vague) or historically older (2008: 11-12). Hence, in cases where it is hard to determine whether or not a lexeme has a meaning that is more concrete, precise or related to bodily action, the use of word etymology, as in the OED, can be useful as a tool to establish metaphoricity. For this reason I have chosen to use the OED as a tool to establish metaphoricity in this thesis.

Since the MIP entails establishing the more basic meaning of a word to identify metaphors in text it can sometimes produce results that at first seems odd. This is because some lexemes are, as discussed in section 2.1, *historical* or *dead* metaphors. The lexeme has an original meaning that has been rendered obsolete and it is now only used in its metaphorical form. However, the metaphor is not recognized as a metaphor but taken literally. An example of this is example [45] in section 4.1.1.2, in which the lexeme *retrieval* is used to conceptualize the process of collecting eggs from the woman before IVF. The first entry in the OED for *retrieve* is 'Hunting. Of a dog, or other hunting animal […] to find or discover game again; *esp.* to flush out or set up game that has gone to cover' (Oxford English

dictionary, accessed 29 March 2012). For this reason the token '[…] who instantly agreed to a second egg *retrieval*' was coded as IVF IS HUNTING under the main metaphor PROCEDURE/ FIELD IS SPORT.

In some cases, although it was clear based on the MIP that a lexeme was being used metaphorically, it could still be difficult to define exactly which domains were mapped and what the conceptual metaphor was. In these cases I consulted the Master Metaphor List (MML). The MML is a list from the University of California at Berkley that attempts to compile conceptual metaphors from cognitive linguists' work from after the publications of Lakoff and Johnson's *Metaphors we live by* (2003) and Reddy's *The conduit metaphor* (1993). The first edition of the list was compiled in 1989 by George Lakoff, Jane Espenson and Adele Goldberg, and the second edition in 1991 by George Lakoff, Jane Espenson and Alan Schwartz (Master Metaphor list, accessed February- March 2012). Although the list has not been updated recently it is still a useful tool because it compiles such a large number of different metaphors.

3.2.2 SPSS

My hypothesis is that the choice of conceptual domains (source and target) in newspaper articles regarding biotechnology and bioethics is dependent on or at least linked to the political orientation of the newspaper. To be able to present any evaluations about the hypothesis regarding its validity, the data material sampled from the corpus has to be subjected to statistical analysis. SPSS (originally Statistical Package for the Social Sciences, now IBM SPSS) is a statistical program that allows for carrying out complex statistical analyses on data material in a relatively short amount of time. The program is used to assess the relations between the different variables in an analysis, as well as to test the statistical significance of the results (Hannisdal 2006: 142). Statistical significance is measured in p-value, which is the probability of a test statistics. The measurement is based on the null hypothesis, which is '[…] a prediction that there is no relationship between the independent and dependent variables' (Hinton et al 2004: 371). The lower the p-value the less likely is it that the observed relationships between the variables are coincidental. If the p-value is lower than a conventional significance level (0.05), the null hypothesis can be rejected and there is a statistical significance in the data (Hinton et al 2004: 372). I have used the program to perform cross tabulations and to run Chi-square tests on the results. The Chi-square test is used to test if results from the data analysis bear any statistical significance and is defined as '[t]he square of the deviation of a score from its population mean divided by the population

variance, where the population is normally distributed' (Hinton 2004: 248-249). For a Chi-square test to be considered accurate all categories have to be mutually independent, this means that none of the figures can contribute to the frequencies in more than one cell, also, no cell should contain an expected frequency equal to or lower than five (Hinton 2004: 258).

Table 3.3: Information cells and statistical variables in SPSS

Information cells	1	Metaphor number
	2	Article
	3	Newspaper
Statistical variables	4	Political orientation
	5	Source domain
	6	Target domain
	7	Word class
	8	Metaphorical chain
	9	Main metaphorical source
	10	Main metaphorical target

As illustrated in table 3.3, the SPSS matrix used in the thesis consists of ten cells; metaphor number, article number, paper number, political orientation, source domain, target domain, word class, chain metaphor, main metaphorical source and main metaphorical target. Every metaphor in the corpus has been given a separate number that can be linked to the paper and article it is taken from. The metaphor is also coded for the political orientation of the paper (conservative or liberal), the metaphor's source and target domains, its word class, whether it is part of a metaphor chain, and finally its main metaphorical source or target domain.

The term *chain metaphor* denotes that a metaphor is dependent on two readings. In order to reach an understanding of the metaphor, one is dependent on another metaphor. An example is the metaphorical token 'nine weeks into a pregnancy' which can be classified as the conceptual metaphor PREGNANCY IS A JOURNEY. However, this understanding of the metaphor presupposes another metaphor, namely TIME IS MOTION. By building on our experience of time as movement we comprehend the 'nine weeks' into pregnancy as a movement towards a destination, and thus pregnancy is conceptualized as a journey. These metaphors do stand out as different from the other metaphors in the corpus, as the reading of the metaphor requires a two-step analysis, as opposed to only one step. Hence, these

metaphors were coded as being part of a metaphorical chain. The notion of the chain metaphor has not been the focus of many scholars so far; still, there are some studies that can be relevant to the understanding of metaphorical chains. In a 1990 article Goossens discusses the relationship between metaphor and metonymy and how one can be derived from the other. The author, among other things finds that metaphor can be derived from metonymy and vice versa. He states that the boundaries between domains are unclear and therefore domains may intertwine (2003: 352). Morover, Halverson and Engene (2010) use the term *metonymic chaining* to explain how the interpretation and understanding of one metonymy is dependent on another metonymy. They state that there is a shift taking place between these different metonymies (2010: 7). There is no reason to believe that these notions should only apply to the relationship between metaphor and metonymy, it is equally relevant to the relationship between two metaphors. The first three cells in table 3.3 are not statistical variables and do not have an impact on the statistical analysis, but are cells which contain information making it possible to trace the metaphorical token to its source text. The seven last cells are statistical variables that can affect the outcome of the statistical analysis (see table 3.3). However, the variables *word class* and *chain metaphor* are only included as part of the analysis in order to record as much information about the tokens as possible. These variables will be presented briefly in the descriptive analysis, but will not be considered in the discussion of the results. This is due to time constraints and considerations of space.

The variables in table 3.3 are assigned different values that are used in order to code the metaphorical tokens. Cell number four in figure 3.1 can serve as an example. The cell is named *political orientation,* denoting the political orientation of the newspapers in the corpus. The variable is assigned two possible values; 1. Liberal, or 2. Conservative, and the tokens are coded accordingly as they are entered into the SPSS matrix.

	Metaphor	Article	Newspaper	Political	SD	TD	WC	Chain	MainS	MainT	var	var	var	var	var	var
115	115	8	2	1	9	7	2	0	2	1						
116	116	8	2	1	91	10	2	0	4	4						
117	117	8	2	1	90	10	2	0	4	4						
118	118	8	2	1	6	10	2	0	6	4						
119	119	8	2	1	14	38	2	0	10	4						
120	120	8	2	1	3	12	1	0	3	3						
121	121	8	2	1	14	38	2	0	10	4						
122	122	8	2	1	3	12	1	0	3	3						
123	123	8	2	1	89	28	2	1	9	5						
124	124	8	2	1	13	39	2	0	11	5						
125	125	8	2	1	38	54	1	1	3	6						
126	126	8	2	1	9	29	2	0	2	7						
127	127	8	2	1	14	10	2	0	10	4						
128	128	8	2	1	14	38	2	0	10	4						
129	129	8	2	1	9	7	3	0	2	1						
130	130	8	2	1	9	7	3	0	2	1						
131	131	8	2	1	6	7	3	0	6	1						
132	132	9	2	1	9	10	2	0	2	4						
133	133	9	2	1	33	45	2	0	1	6						
134	134	9	2	1	9	7	2	0	2	1						
135	135	9	2	1	3	8	1	0	3	4						
136	136	9	2	1	9	18	2	0	2	1						
137	137	9	2	1	9	10	2	0	2	4						
138	138	9	2	1	9	10	2	0	2	4						

Data View Variable View

Figure. 3.1: Data view in SPSS matrix.

The work with the matrix started out with the five statistical variables political orientation, source domain, target domain, word class, and chain metaphor. However, as the matrix developed and the number of sub-mappings within the variables *source* and *target* increased, it became evident that it was necessary to add two more variables that indicated the main metaphorical source and target of the tokens. These variables were labeled *main metaphorical source* and *main metaphorical target* (see section 2.1). There are two reasons for including these additional variables. Firstly, the number of source domains grew, largely due to the fact that the metaphors were analyzed at a detailed level. This meant that sub-mappings within the same main metaphorical theme were coded as separate source domains. This type of detailed categorization is a good way of gaining as much information as possible about the mappings, as it captures the plethora of metaphorical sub-mappings within the field studied. This is especially relevant to this thesis as I want to study, not only, what kind of conceptual metaphors the two political orientations use, but also the more subtle details of *how* they use them. However, a detailed categorization of the sub-mappings involved also makes it harder to see the main metaphorical domains and the relations between the different metaphors. The two additional variables was therefore included in the matrix so that the detailed distinction between sub-mappings that was being preserved in the *source* and *target* variables was

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balanced by a grouping of sub-mappings into larger main metaphorical themes in the *main metaphorical source* and *main metaphorical target* variables.

Secondly, a criterion for the Chi-square test to be reliable is that none of the cells in the analysis contains values equal to or lower than five. Since the *source* variable had a large number of different mappings (values) the figures in some of the cells were equal to or lower than five. The *main metaphorical source/ target* variables was thus included as a way of collapsing categories so that the cell figures would be higher than five, making it possible to run a Chi-square test on the results of the analysis. Such a collapsing or grouping of source domains is described by Lynn Cameron as a way 'to help the researcher make sense of the data by condensing it into meaningful metaphor trajectories' (Cameron 2011: 47). Cameron points out that the grouping of source domains is a process that will evolve as the researcher works, and that even though the aim of a linguistic analysis is always to be rigorous, a grouping of source domains into larger categories will always be interpretive and flexible, and relies on the researcher's creativity and imagination. The process thus has to be a combination of creativity with as much methodical rigour as is possible (Cameron 2011: 45-47).

The collapsing of sub-mappings into main metaphorical domains was done slightly different for the variables *main metaphorical source* and *main metaphorical target*. Grouping the source domains into main metaphorical source domains was relatively straightforward, because the patterns of relation between the sub-mappings were quite easily recognizable. Hence, all sub-domains were clearly connected to some of the other sub-domains and belonged under a main metaphorical source domain (see section 3.2.1 for example of grouping of source domains into main metaphorical source domains). This was predominantly due to the fact that many of the source domains were involved in highly conventionalized cross-domain mappings. For instance, the sub-domains MERCHANDISE, BUSINESS, COSTS, JOB, MONEY, PRIZE, and TIMETABLE were grouped under the main metaphorical source domain BUSINESS, and the sub-domains COMPUTER, COMPUTER OPERATOR, MACHINE, PRODUCT, WASTE MATERIAL and CODE were grouped the main metaphorical source domain MACHINE. An overview of grouping of source domains into main metaphorical source domains is included in appendix C. MACHINE and CONTAINER metaphors are considered special cases of OBJECTIFICATION metaphors, as machines and containers are types of objects. They are subordinate to OBJECTIFICATION; however, since the domains are of the most commonly used OBJECTIFICATION metaphors and often occur highly frequently they are often grouped separately, as I have done in this thesis. Moreover, THRESHOLD metaphors are considered a special case of JOURNEY, but because scientific discourse is

known to be ripe with this type of metaphor it was considered separately in the thesis. In the discussion of the results, in section 4.2, these domains will be discussed in relation to each other, as they evoke similar associations and involve the same type of evaluation and valuation of concepts.

As mentioned above, the grouping of target domains into main metaphorical target domains was done in a slightly different way than the grouping of source domains. This is because the target domains are, naturally, not as clearly delineated as the source domains. Also, when conceptual metaphors are discussed they are first and foremost categorized according to the main metaphorical source. For instance, LOVE IS A JOURNEY is not classified as a LOVE metaphor, but rather as a JOURNEY metaphor. Hence, there are fewer clear patterns to follow in the grouping of target domains. Therefore, the grouping of sub-domains into main metaphorical target domains was based largely on my intuition regarding the lexemes relations to each other. An overview of grouping of target domains into main metaphorical target domains is included in appendix B. I started by grouping sub-domains into the five main metaphorical target domains BABY, MOTHER, PREGNANCY, PROCEDURE/ FIELD and DEBATE. However, as Cameron states the grouping of domains is a process and the main metaphorical domains emerge as the grouping takes place. Some of the target domains, although they were part of cross-domain mappings conceptualizing biotechnology and bioethics and the target domains investigated, were not sub-domains to any of the five domains BABY, MOTHER, PREGNANCY, PROCEDURE/ FIELD and DEBATE. These sub-domains were therefore divided into the additional five main metaphorical target domains; HUMAN STATES, LIFE/SOCIETY, MARKET/BUSINESS, HUMAN PROCESSES/ PROPERTIES and OTHER.

As previously mentioned, all categories in the SPSS matrix have to be mutually independent in order for the Chi-square test to be considered reliable. The variables *source* and *main metaphorical source,* and *target* and *main metaphorical target* in the SPSS matrix cannot be considered mutually independent as they both contain information about the same metaphorical tokens, even though the mappings are at different levels. Still, this is not considered a problem as I will only be running Chi-square tests on the variables main metaphorical source and main metaphorical target.

3.3. Metaphor approach to newspaper ideology

Although this paper does not aim directly at saying something about the newspaper's ideology, rather something about how metaphor is part of creating and sustaining ideological views in news media text, some discussion about newspapers' ideology will be a part of the analysis. For that reason I have included a list of three conditions that the linguist Rene Dirven proposes have to be met when applying a metaphor approach to reveal aspects of journal's or newspaper's ideology (Dirven 1990: 570):

(i)   Each metaphorical expression has to be isolated together with sufficient context so that it is possible to allocate it to a given domain.

(ii)   The selection and delimitation of domains cannot be fixed in advanced, but will have to be dictated by the data collected.

(iii) The 'metaphor approach' to the ideological stand of a newspaper can only reveal very basic and general tendencies, not the newspapers' stand on concrete political issues. Still, these basic tendencies may be the more important ones, since it is likely that they will determine the paper's ideology regarding more concrete issues.

Like Dirven, Underhill also stresses the importance of evaluating meaning in the context in which it is found, and states that words take on meaning in context by virtue of complex and subtle links and paths which are activated within the mind. Concepts can be lifted out of language to be discussed, but in doing so, by separating the concepts from their linguistic base, their context, they lose much of the meaning they have when they are observe within the language system, within discourse (Underhill 2011: 8). I have fulfilled Dirven's first condition by applying the metaphor identification procedure as a tool of analysis, which involves looking at the metaphorical expression in the context that it is being applied. The second condition is also met; it was through the analysis of the data and work with the SPSS matrix that the source domains were defined. None of the domains were fixed in advance, although I did have some expectations as to which domains would surface.

The third of Dirven's conditions is perhaps the most important one. In his article Dirven elaborates on this notion by pointing to the fact that the metaphor approach to ideology is not able to uncover all aspects of a group's ideology, only those aspects of it that have been conceptualized through the use of language (Dirven 1990: 572). These limitations to the metaphor approach to newspapers' ideology will off course be taken into account in the

discussion of the results in section 4.2. I would therefore like to stress that the results found in this thesis can be said to represent the particular articles examined. Nevertheless, the results may provide some indications of how newspapers in general use metaphorical terms to create and sustain ideology.

4. RESULTS AND DISCUSSION

This chapter presents the results of the MIP and the following analysis, and consists of two sections. The first section, 4.1, presents the results of the analysis by giving an account of the six variables in SPSS and how they relate to each other. For each of the variables the corpus will be presented as a whole first, before the sub-corpora of conservative and liberal articles are presented and compared. As the number of words in the corpus is not distributed evenly between the two political orientations, results will be given both in raw frequencies and in percentage distribution to enable a comparison of the results. Chi square tests will also be run on the results in order to decide whether they are statistically significant. In section 4.2 the results presented in section 4.1 will be discussed. Included below are my research questions as they were stated in the introduction of the thesis. The first two questions, a) and b), will be considered in the first section of the chapter and question c) will be part of the discussion in the last section.

a) What kind of conceptual metaphors are applied to describe BABY, MOTHER, PREGNANCY, the biotechnical PROCEDURE/ FIELD and the DEBATE?
b) How, and to what degree, do the metaphors of the debate differ, depending on the newspapers political orientation/ the newspapers ideology? And how, and to what degree are they similar?
c) How can the choice of metaphor affect the image projected of BABY, MOTHER, PREGNANCY, the biotechnical PROCEDURE/ FIELD and the DEBATE?

4.1 Descriptive analysis

The material analyzed is a corpus consisting of 30 newspaper articles from six daily American newspapers gathered in the period 25 January 2012 to 31 January 2012. The corpus was collected through manual selection using the papers' archives on the internet and consists of 49 456 words. As discussed in section 3.1.2 the number of words representing each political orientation in the corpus was somewhat unevenly distributed, however, the distribution of metaphorical tokens was very similar for the liberal and the conservative newspapers. Of the total 478 metaphorical tokens there were 234 tokens from the liberal newspapers, which made up 49 percent of the metaphors in the corpus. In comparison, the metaphors from the conservative newspapers made up 51 percent of the all metaphors in the corpus, and counted

244 tokens. Table 4.1 presents an overview of how the number of words is distributed across the political orientations, and figure 4.1 depicts the distribution in a bar chart.

That the number of metaphorical tokens is so similar across the political orientations despite the difference of words in the corpus is interesting as it indicates that the conservative newspapers use more metaphors than the liberal newspapers. By calculating the number of metaphors per thousand words it is clear that the conservative texts contain as many as 13 metaphors per thousand words, compared to 8 metaphors per thousand words in the liberal texts.

Table 4.1: Metaphorical tokens given in raw frequency and percentage distribution in the corpus sorted according to political orientation.

		Raw frequency	Percent
Valid	Liberal	234	49.0
	Conservative	244	51.0
	Total	478	100.0
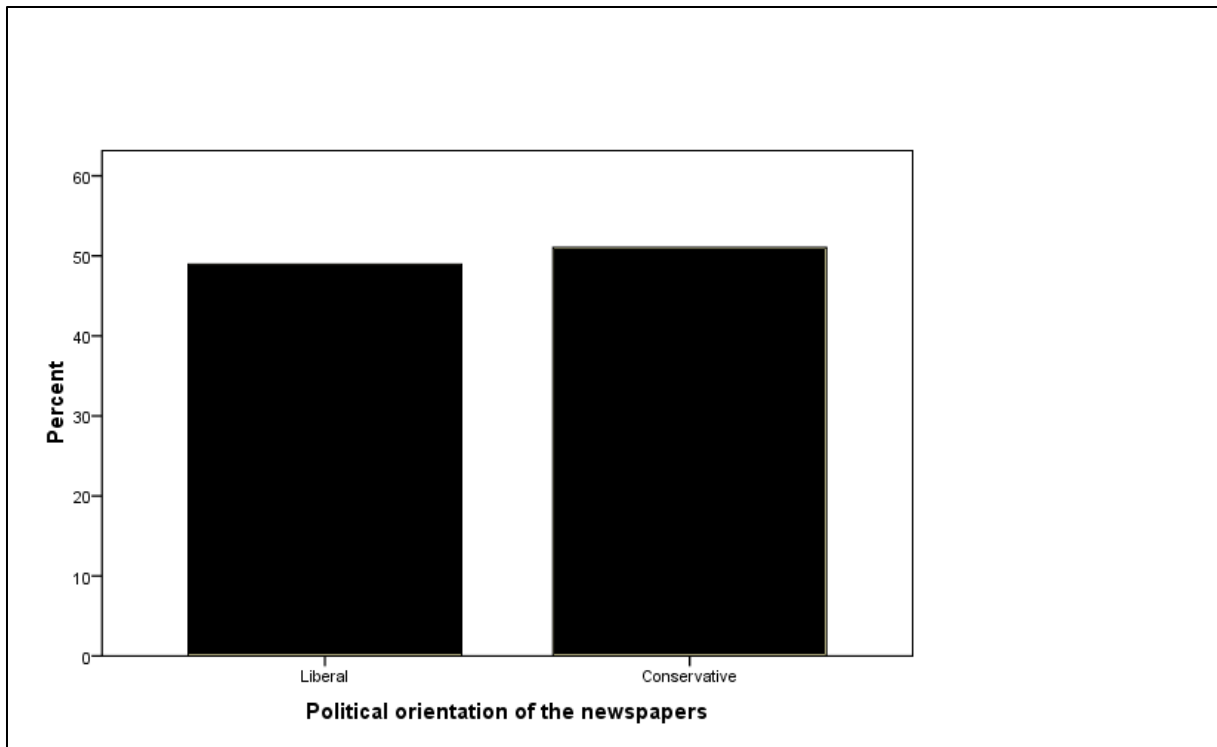
Figure 4.1: Bar chart showing percentage distribution of metaphorical tokens arranged by political orientation.

As described in section 3.2, the metaphorical tokens were coded for political orientation of the paper, the metaphor's source and target domains, its word class, whether it is part of a metaphor chain, and finally, its overarching metaphorical source and target domains.

The metaphors were coded at two levels; the detailed level of sub-mapping and the main metaphorical level (see sections 2.1 and 3.2.2). The source domains were coded at the sub-mapping level under the variable *source* and at the main metaphorical level under the variable *main metaphorical source*. Target domains were coded at sub-mapping level under the variable *target* and at the main metaphorical level under the variable *main metaphorical target*. The *main metaphorical target* domains found correspond to the domains investigated in the thesis; BABY, MOTHER, PREGNANCY, PROCEDURE/ FIELD, DEBATE, and the additional domains HUMAN STATES, LIFE/SOCIETY, MARKET/BUSINESS, HUMAN PROCESSES/PROPERTIES and OTHER.

When I discuss the values for the variables source and target I refer to them as *sub-mappings*, or simply *source domain* and *target domain*. Values for the variable main metaphorical source and main metaphorical target will be termed *main metaphorical source* or main *metaphorical target domain* or *main metaphorical mapping*. The tokens used as

examples in this chapter are assigned a reference number that is included in brackets at the end of the example, and which corresponds to the tokens' entry in SPSS. This is illustrated in the example given below:

[1] […] to give us some *unpressured* time (61)

The intention behind coding the metaphors at two levels is, as mentioned in the methodology chapter, an attempt to enable an analysis where it is not only possible to see what kind of conceptual metaphors are being applied by the two opposing political orientations, but also to see the more subtle details of *how* they apply them. Because the tokens are coded at the sub-mapping level the *source domain* and *target domain* variables ended up having many cells, with low figures. The Chi square test is not reliable if it is applied on cells with figures lower than five. It is therefore the variables main metaphorical source and main metaphorical target that will be used in the descriptive and statistical analysis to establish what domains are being applied by the newspapers, how they apply them and if the results can be said to be statistically significant. The variables source and target, containing the sub-mappings, will only be used as a way to further investigate the conceptual metaphors and the distinctions they display in the way they are used by the conservatives and the liberals comparatively. The analysis of the variables on the sub-mapping level will be given in, and discussed based on percentage distribution; the variables on the main metaphorical level will be given in, and discussed based on percentage distribution as well as statistical significance.

Coding the metaphors at the detailed level of sub-mapping caused the number of occurrences within several of the sub-mappings to be relatively low. In a number of cases there was only one mapping within a certain sub-domain, when these cases are discussed this will be pointed out. Due to these low figures, it is important to remember that the results based on the sub-mappings are only an indication of what might be a general tendency, and not a definite trend, and that the results are only able to say something about this particular dataset. However, even though the results based on the main metaphorical domains may be more reliable for making some assumptions beyond the results of this thesis, the results based on the sub-mappings, despite their low number of occurrences, might be able to point to some interesting differences in how cross-domain mappings are used across the political orientations.

Before I commence with the analysis I will give an example of the type of analysis that lies behind the examples given in the following sections. A very common cross-domain mapping in the corpus is BABY IS AN OBJECT. This mapping represents 56 percent of the

OBJECTIFICATION metaphors in the conservative sub-corpus, and 10 percent of all metaphors in the conservative sub-corpus. Examples [2] and [3], given below, demonstrate this type of sub-mapping. Both examples belong to the sub-mapping EMBRYO IS AN OBJECT within the broader superordinate metaphor BABY IS AN OBJECT.

[2] […] PGD, processes in which embryos are *created* in a test -tube […] (150).

[3] […] many people will find *destroying* an embryo […] (421).

In example [2] it is the use of the word *create* that forms the cross-domain mapping EMBRYO IS AN OBJECT. The first entry of *create* in the Oxford English Dictionary is *'of a divine being or natural agency'*, and the earliest recorded use of the word is in Chaucer's *Parson's Tale* from 1405 in which it is used in the following way *'Al be it so þt god hath creat […] alle thynges in right ordre'* (Oxford English Dictionary, accessed 18 March 2012). The way *create* is used in the entry it is related to things that are created naturally or by a divine agent. I consider this use to be more basic because it is connected to natural processes as opposed to the technical and artificial process of PGD. Hence, this meaning of the word is both older and more basic than the way it is used in the token. When *create* is used in the dictionary with a human agent it is an inanimate object that is created, and not a human being. The only exception to this is in cases where it is referred to natural procreation. Therefore, I consider the use of the word *create* with a human agent, an OBJECTIFICATION of EMBRYO. The lexeme *destroy* is used in example [3] to denote the termination of embryos after or during fertility treatment. The lexeme has a more basic meaning than the way it is used in the token. The first entry in the OED defines is as such "*to pull down or undo (that which has been built); to demolish, raze to the ground*". This meaning of the word is more basic in the sense that it is more concrete and precise than the way it is used in the corpus token. By applying the lexeme *destroy* to the concept of EMBRYO, EMBRYO is conceptualized as a thing, an object that is man-made and that can easily be done away with. This entails a commodification of embryos that weakens moral obligations and raises fewer ethical dilemmas than what could have been the case if the embryo had been conceptualized differently.

I will now proceed with the descriptive analysis as described above.

4.1.1 Target domain and main metaphorical target

4.1.1.1 The combined corpus

The variables target domain and main metaphorical target are presented together as they are closely linked and describe the same metaphors at different levels (subordinate level and superordinate level). Table 4.2 shows the metaphorical target domains in raw frequency and percentage distribution for the whole corpus. The percentage points have been rounded up to the nearest whole number. The analysis revealed 112 different sub-mappings within the variable *target domain* that were sorted according to the main metaphorical target domains: BABY, MOTHER, PREGNANCY, PROCEDURE/FIELD, DEBATE, HUMAN STATES, LIFE/SOCIETY, MARKET/BUSINESS, HUMAN PROCESSES/PROPERTIES and OTHER. As illustrated in table 4.2, PROCEDURE/ FIELD clearly emerged as the domain that was involved in the highest number of cross-domain mappings, with 48 percent of all the tokens in the corpus. BABY was the second most frequently applied domain with 18 percent of the metaphors. In addition to being the domain involved in the highest number of cross-domain mapping PROCEDURE/ FIELD is also the domain that is conceptualized through the largest number of different sub-mappings.

The rest of the domains ranged between seven percent (LIFE/ SOCIETY) and 1 percent (MARKET/BUSINESS). Figure 4.2 depicts the percentage distribution of the main metaphorical target domains illustrated in a bar chart.

Table 4.2: Main metaphorical target domains given in raw frequency and percentage distribution in the whole corpus.

	Raw frequency	Percent
Baby	86	18
Mother	17	4
Pregnancy	17	4
Procedure/ Field	227	48
Debate	26	5
Human states	8	2
Life/ society	34	7
Market/ business	6	1
Human processes/ properties	30	6
Other	27	6
Total	478	101[2]
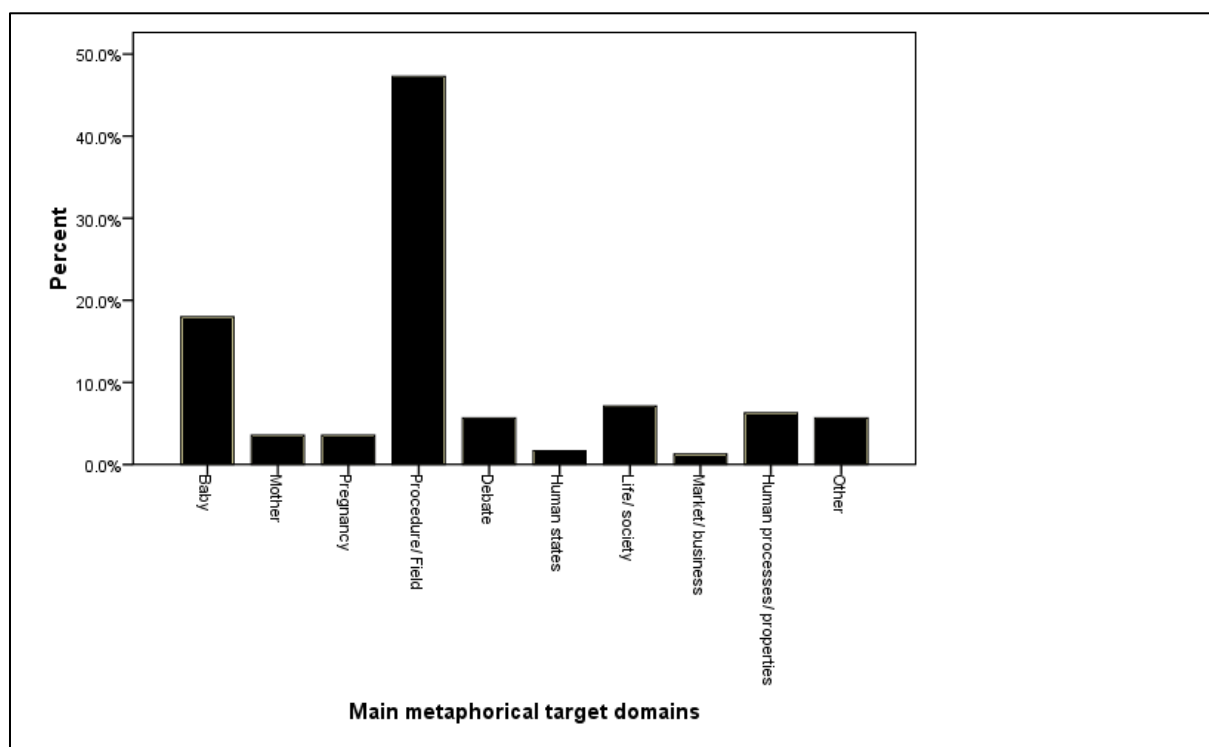
Figure 4.2: Main metaphorical target domains.

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[2] Total not equal to 100 due to rounding.

4.1.1.2 Comparison of the sub-corpora
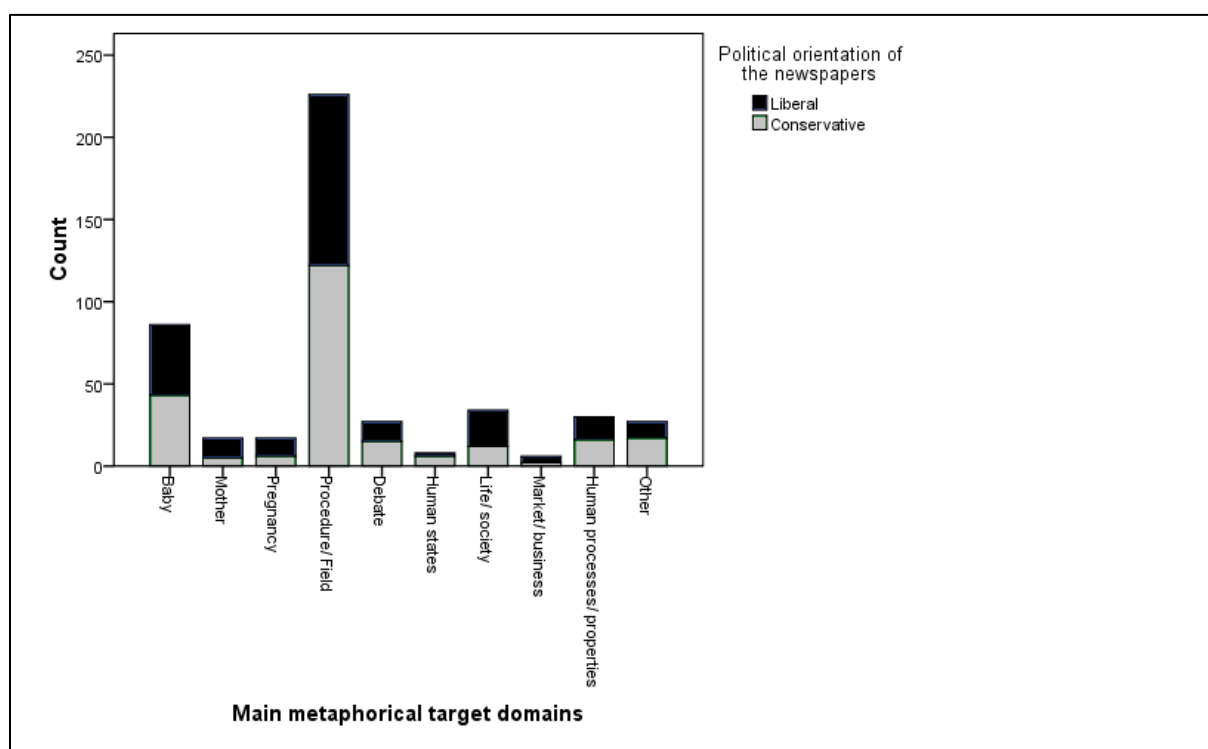
Figure 4.3: Main metaphorical target domains sorted according to political orientation.

Table 4.3: Main metaphorical target domains sorted according to political orientation (raw frequency and percentage).

	Liberal		Conservative	
Target domain	Rf	% within sub-corpus	Rf	% within sub-corpus
PROCEDURE/FIELD	104	45	122	50
BABY	43	18	43	18
LIFE/SOCIETY	22	9	12	5
HUMAN PROC./ PROP.	14	6	16	7
MOTHER	12	5	5	2
DEBATE	12	5	15	6
PREGNANCY	11	5	6	3
OTHER	10	4	17	7
MARKET/BUSINESS	4	2	2	1
HUMAN STATES	2	1	6	3

Illustrated in figure 4.3 and table 4.3 is the percentage distribution of the main metaphorical target domains according to the political orientation of the newspapers. The liberal papers use more metaphors involving the domains LIFE/SOCIETY, MOTHER, PREGNANCY, and MARKET/BUSINESS than the conservative papers. The conservative papers on the other hand use more metaphors within the domains of PROCEDURE/FIELD, DEBATE, HUMAN STATES, HUMAN PROCESSES/PROPERTIES and OTHER. BABY is conceptualized equally by the two sub-corpora.

Table 4.4, given below, shows the results of the Pearson Chi-square test that was run on the cross tabulation of main metaphorical target domain and political orientation. The test demonstrates whether the differences in distribution of the main metaphorical target domains across the political orientation is larger than what can be expected to occur by chance. As explained in section 3.2.2. the values for the variables source and target were collapsed into superordinate categories, main metaphorical source and main metaphorical target in order to create cells with figures high enough (expected count over five) to run a Chi-square test on the results of the analysis. However, even after the values of the variables were grouped under the main metaphorical domain some cells still contained expected values equal to or lower than five. Within the variable main metaphorical target 20 percent of the cells had expected values equal to or lower than five. The result of the Pearson Chi-square test is thus not entirely reliable as a measure of statistical significance. Still, considering the even distribution of main metaphorical target domains across the political orientations based on percentage distribution, it is likely that even with all cases valid the Chi-square test would not reveal statistically significant results.

Table 4.4: Chi-square test main metaphorical target domain/ political orientation.

	Value	df	*p*-value
Pearson Chi-Square	13.450	9	.143
N of Valid Cases	478		

To test this notion, the variables HUMAN STATES and MARKET/BUSINESS, which contained the non-valid cases, were cleared from the data, and a new Chi-square test was run (table 4.5). The revised cross-tabulation is given in table 4.5 below. This Chi-square test shows that there

is no statistical significance beyond the .05 level: x^2 $(7) = 10.852; p > 0.05$. Hence, the Chi-square test does not refute the null-hypothesis. Therefore, it is reasonable to assume that any significant differences in the way that liberal and conservative newspapers apply cross-domain mappings are not found at this level of metaphorical mapping.

Table 4.5: Chi-square test main metaphorical target domain/ political orientation.

	Value	df	*p*-value
Pearson Chi-Square	10.852	7	.145
N of Valid Cases	464		

Table 4.6: Revised cross-tabulation main metaphorical target/ political orientation.

			Political orientation of the newspapers		Total
			Liberal	Conservative	
Main metaphorical target mapping	Baby	Count	43	43	86
		Adjusted Residual	.2	-.2	
	Mother	Count	12	5	17
		Adjusted Residual	1.8	-1.8	
	Pregnancy	Count	11	6	17
		Adjusted Residual	1.3	-1.3	
	Procedure/ Field	Count	104	123	227
		Adjusted Residual	-1.4	1.4	
	Debate	Count	12	14	26
		Adjusted Residual	-.3	.3	
	Life/ society	Count	22	12	34
		Adjusted Residual	1.9	-1.9	
	Human proc,/ prop.	Count	14	16	30
		Adjusted Residual	-.3	.3	
	Other	Count	10	17	27
		Adjusted Residual	-1.3	1.3	
Total		Count	228	236	464

The main metaphorical target domain that displays the largest variation between the political orientations is PROCEDURE/FIELD (see table 4.3). The domain is involved in 45 percent of the metaphors in the liberal sub-corpus and in 50 percent of the metaphors in the conservative sub-corpus. There is thus a difference of five percentage points in favor of the conservative texts in the use of metaphors in which PROCEDURE/FIELD is the main metaphorical target domain. The domains LIFE/SOCIETY and MOTHER also show a noticeable degree of difference in percentage distribution based on political orientation. LIFE/SOCIETY is applied four percentage points more and MOTHER is applied three percentage points more in the liberal newspapers than the conservative newspapers, and the domain OTHER is used three

percentage points more in the conservative sub-corpus than in the liberal. The rest of the domains are fairly evenly distributed for both the liberal and the conservative sub-corpus. Nonetheless, the sub-mappings that are grouped under the main metaphorical target domains might display more variation between the sub-corpora.

Table 4.7: Most frequently conceptualized target domains in the corpus (raw frequency and percentage).

Main metaphorical target domain	Target domain	Combined corpus	Liberal		Conservative	
		%	RF	%	RF	%
BABY	EMBRYO	11	25	11	30	12
	BABY	6	18	8	11	5
LIFE/ SOCIETY	BODY	5	15	6	7	3
PREGNANCY	PREGNANCY	3	11	5	5	2
PROCEDURE/ FIELD	CELL	7	23	10	11	5
	IVF	7	15	6	16	7
	PGD	6	10	4	18	7
	STEM CELL RESEARCH	5	7	3	16	7
DEBATE	DEBATE	2	5	2	6	3
Total		52	129	55	120	51

Out of the 112 sub-domains that were found in the article texts the most frequently used domains (given in falling range) were EMBRYO, CELL, IVF, BABY, PGD, STEM CELL RESEARCH, BODY, PREGNANCY and DEBATE. These domains combined represent 49 percent of all the metaphors in the combined corpus, and are mostly involved in similar cross-domain mappings across the political orientations. However, there are some distinctions that I would like to point to. These involve differences in the way that certain cross-domain mappings are being used by the liberal and conservative papers, and that are interesting as they might indicate something about the relationship between the political orientations and their use of metaphors. From here on, when I compare domains or sub-corpora the comparison is based on percentage points, although I will sometimes simply refer to the difference as *more* or *less.*

Table 4.7, presented above, lists the most frequently conceptualized target domains in the corpus given in raw frequency and percentage distribution of the sub-corpora, and total

percentage distribution in the whole corpus. The target domains that display the largest variation between the conservative and liberal newspapers in percentage distribution are, in decreasing order, CELL from the main metaphorical target domain PROCEDURE/FIELD, BODY from the main metaphorical target domain LIFE/SOCIETY, and BABY, STEM CELL RESEARCH and PGD from the main metaphorical target domain PROCEDURE/FIELD. The first three target domains are more often conceptualized in the liberal newspapers. CELL is conceptualized five percentage points more in the liberal texts than in the conservative ones; BODY is conceptualized three percentage points more and BABY is conceptualized three percentage points more. The two latter domains are used more in the conservative texts than the liberal ones, with STEM CELL RESEARCH being conceptualized four percentage points more in the conservative text than in the liberal ones, and PGD three percentage points more. The target domain IVF is almost conceptualized equally by the two political orientations.

The other domains display smaller variations across the political orientations, but not any significant differences. Nevertheless, variations that are not obvious at the level of percentage distribution might occur once the target domains are examined closer to see what type of cross-domain mappings they are involved in. Thus, in order to gain a more detailed understanding of the way the two political orientations apply cross-domain mappings in the corpus texts, I will examine all the sub-domains listed in table 4.7 and the mappings they are involved in more thoroughly below. The domains will be presented in the order they appear in table 4.7. Each domain is presented in a table, the table first lists the main metaphorical source domains that are found within both the sub-corpora, before the domains only found in the liberal sub-corpus are listed, and lastly the domains only found in the conservative sub-corpus are listed. Figures are given in falling order. If the range of the figures does not correspond between the two sub-corpora when the domains common to both political orientations are listed the liberal figures decide the order.

Table 4.8: Distribution of source domain mappings within the target domain EMBRYO (raw frequency and percentage).

EMBRYO				
	Liberal		Conservative	
Source domain	Rf	% in target domain	Rf	% in target domain
OBJECTIFICATION	14	56	20	67
PERSON	4	16	4	13
MACHINE	2	8	2	7
NATURE	2	8	1	0
CONTAINER	1	4	3	10
JOURNEY	1	4	0	0
GAME	1	4	0	0

The target domain EMBRYO is used in cross-domain mappings with the main source domains OBJECTIFICATION, PERSONIFICATION, MACHINE, NATURE, and CONTAINER within both political orientations. In addition, the liberal articles contain one JOURNEY and one GAME metaphor involving EMBRYO that is not paralleled in the conservative texts. Hence, the liberal articles display a slightly larger variation in the types of sub-mappings applied. Predominantly, EMBRYO is involved in the same types of cross-domain mappings across the political orientations, but some of the sub-mappings used display some differences between the liberal and the conservative papers. EMBRYO IS OBJECT is the most commonly used metaphorical mapping for EMBRYO for both the political orientations, examples [4]-[6]. In the corpus EMBRYOS are also conceptualized as people through the use of PERSONIFICATION metaphors, such as the one in [7]. The sub-mappings within the personification metaphors are similar across the political orientations. Moreover, both the liberal and the conservative texts apply MACHINE metaphors to conceptualize EMBRYO, but the sub-mappings used are dissimilar. The liberal texts use the metaphors EMBRYO IS MATERIAL as illustrated in [8], and EMBRYO IS WASTE MATERIAL as shown in [9]; whereas the conservative texts use the metaphor EMBRYO IS PRODUCT as in [10], and EMBRYO IS A MACHINE as in [11]. There are two occurrences of NATURE metaphors in the liberal texts, in which EMBRYO is conceptualized as PLANT and WEED in examples [12] and [13]. In the conservative texts there is one NATURE metaphor, and that is a conceptualization of EMBRO as a PLANT, example [14].

[4] […] tests human embryos *created* in the lab […] (412).

[5] 400 000 *excess* embryos languishing in freezers […] [130].

[6] […] stem cell research is in no way complicit in the *destruction* of embryos (306).

[7] […] *candidates* [embryos] to implant in the mother's uterus (185).

[8] […] there are *stockpiles* of abandoned embryos (309).

[9] […] the *disposal* of unused embryos […] (218.)

[10] […] reproduction and conception as a way to *create products* for research (436).

[11] […] made solely to *produce* stem cells for the lab (429).

[12] Couples *cull* embryos […] (163).

[13] […] use PGD to *weed out* embryos […] (208).

[14] […] the number of embryos *planted* in the womb during in vitro […] (283).

The metaphor EMBRYO IS CONTAINER is used by both the conservative and the liberal newspapers. Both political orientations have one mapping of EMBRYO as a CONTAINER FOR GENES, example [15], in addition the conservative text also contain the mappings EMBRYO IS A CONTAINER FOR DISEASE, example [16], and EMBRYO IS A CONTAINER FOR CHROMOSOMES, example [17]. The JOURNEY and GAME metaphors applied in the liberal but not the conservative part of the corpus are EMBRYO IS A SHELTER (for disorders) as shown in [18] and EMBRYOS ARE PLAYERS IN A GAME as in [19].

[15] […] selected four out of 15 [embryos] that did not *contain* the Alzheimer's gene […] (234).

[16] […] whether would-be parents may screen for disease *in* their embryos or fetuses? (423).

[17] […] each embryo *carried* three sets of chromosomes […] (16)

[18] […] embryos that *harbor* chromosomal disorders […] (209).

[19] I don't want to leave them [unused embryos] *out of the game* (354).

Table 4.9: Distribution of source domain mappings within the target domain BABY (raw frequency and percentage).

BABY				
	Liberal		Conservative	
Source domain	Rf	% in target domain	Rf	% in target domain
OBJECTIFICATION	8	44	3	27
MACHINE	7	39	6	55
RELIGION/MYSTERY	3	17	0	0
BUSINESS/MONEY	0	0	2	18

The target domain BABY is conceptualized through the source domains OBJECTIFICATION and MACHINE by both political orientations. In addition to these domains, the liberal texts also include mappings of BABY within the main metaphorical theme of RELIGION/ MYSTERY that is not present in the conservative texts. In the conservative texts there are mappings of BABY within the BUSINESS/ MONEY domain that is not paralleled in the liberal texts. OBJECTIFICATION metaphors are more frequently used in the liberal texts than in the conservative texts, and form, through the use of lexemes like *create* and *make,* a conceptualization of BABY as an OBJECT that is being made in the process of IVF and PGD, [20] and [21]. The metaphors that fall within the metaphorical theme of MACHINE conceptualize BABY as a PRODUCT of the process of IVF/PGD or STEM CELL RESESARCH, as in [22].

[20] [Babies] typically *created* using frozen embryos […] (136).

[21] […] of using embryos that were originally intended to *make a child* (432).

[22] […] can identify sperm samples most likely to *produce* either a boy or a girl (97).

[23] A hearing baby would be *a blessing* (152).

[24] […] or will parents use the procedure for *custom- ordered* children? (238).

[25] […] now we are *buying* our way out [of infertility] (57).

The RELIGION/MYSTERY mappings applied in the liberal texts involve a conceptualization of BABY as a GIFT to the parents, as illustrated in example [23]. The question of metaphoricity in this case is dependent on the worldview of the analyst. For a religious

person, the statement that a baby is a gift from God might be interpreted literally and not metaphorically. However, I have chosen to include the token as a metaphor in the corpus because I see it as a metaphorical expression meaning that a baby will bring happiness and joy into the lives of parents, and not literally be a sacred sign from a higher power. The conservative texts have two occurrences in which the target BABY is mapped to the source BUSINESS/MONEY; this is a cross-domain mapping that is not present in liberal texts. Similar to the objectification metaphors mentioned above, the use of the BUSINESS/MONEY metaphor also imply that a child is something that can being made, and builds on this notion by conceptualizing the BABY as MERCHANDISE for sale, [24] and [25].

Table 4.10: Distribution of source domain mappings within the target domain BODY (raw frequency and percentage).

BODY				
	Liberal		Conservative	
Source domain	Rf	% in target domain	Rf	% in target domain
CONTAINER	12	80	5	71
MACHINE	1	7	1	14
BUILDING	1	7	1	4
JOURNEY	1	7	0	0

BODY is conceptualized through CONTAINER, MACHINE and BUILDING metaphors in both the liberal and conservative articles, and in addition the liberal articles contain JOURNEY metaphors. The CONTAINER metaphors are applied to the texts to conceptualize the body as a container for genes, embryos, cells, life, and DNA, as exemplified in [26] and [27]. The MACHINE metaphors are applied through the sub-mapping BODY IS A MACHINE as illustrated in [28]. Within the main metaphorical target domain BUILDING it is the sub-mapping BODY IS A BUILDING that is applied by both political orientations, as in [29]. The JOURNEY metaphor that is applied in the liberal sub-corpora is BODY IS A SHELTER (for genes) as shown in [30].

[26] […] transferring the remaining embryos *into* a woman (221).

[27] […] test that determined who in the family *carried* the gene (395).

[28] Even as you *steel* yourself for more shots […] (73).

[29] […] he guided it [the needle] through her *vaginal wall* […] (320).

[30] […] were able to determine that she did not *harbor* the defective gene (164).

Table 4.11: Distribution of source domain mappings within the target domain PREGNANCY (raw frequency and percentage).

PREGNANCY				
	Liberal		Conservative	
Source domain	Rf	% in target domain	Rf	% in target domain
JOURNEY	6	55	3	60
OBJECTIFICATION	3	27	1	20
GAME	1	9	1	20
CONTAINER	1	9	0	0

PREGNANCY is talked about through the use of JOURNEY, OBJECTIFICATION, and GAME metaphors within both the liberal and the conservative texts, and in addition the liberal texts have one CONTAINER metaphor. The sub-mappings that are used are mainly the same across the political orientations. PREGNANCY IS A JOURNEY, in [31] and [32], and PREGNANCY IS A DESTINATION [33] is found in both sub-corpora, PREGNANCY IS AN AREA [34] on the other hand, is only present in the liberal texts. Within the main metaphorical target domain of OBJECTIFICATION it is the conceptualizations like PREGNANCY IS AN OBJECT, as in [35] that is applied in both the liberal and the conservative texts. The GAME metaphor used in the liberal corpus has the sub-mapping PREGNANCY IS GAMBLING, as in [36], and the CONTAINER metaphor from the liberal sub-corpus is realized as PREGNANCY IS A CONTAINER FOR RISK, as [37] shows.

[31] […] as early as nine weeks *into* a pregnancy […] (41).

[32] […] the *passage* from conception to birth […] (122).

[33] […] we'll just *keep going* (342).

[34] That and other aspects of the *pregnancy landscape* could change as a result of the new study (226).

[35] […] might be asked to undergo fetal *reduction,* […] (289).

[36] What if parents could *boost the odds* of getting the gender of choice […] (398).

[37] […] while sometimes desired, *carries greater risk* of miscarriage and premature delivery.

Table 4.12: Distribution of source domain mappings within the target domain CELL (raw frequency and percentage).

		CELL		
		Liberal		Conservative
Source domain	Rf	% in target domain	Rf	% in target domain
PERSON	9	39	2	18
MACHINE	5	22	4	36
OBJECTIFICATION	3	8	1	9
BUSINESS/MONEY	1	4	1	9
CONTAINER	2	9	0	0
FIRE	1	4	0	0
WAR	1	4	0	0
NATURE	1	4	0	0
JOURNEY	0	0	1	9
BUILDING	0	0	2	18

The target domain CELL displays a larger degree of variation than the other target domains, when it comes to the type of source domains used by the two political orientations. In both the liberal and the conservative articles CELL is conceptualized through PERSONIFICATION, MACHINE, OBJECTIFICATION and BUSINESS/MONEY metaphors. In addition the liberal texts apply CONTAINER, FIRE, WAR, and NATURE metaphors, and the conservative texts apply JOURNEY and BUILDING metaphors. The two political orientations use the personification metaphor CELL IS A PERSON, as in [38], and the liberal texts also contain the metaphor CELLS ARE FAMILY, see [39]. The conceptualization of CELL as MACHINE is almost equally realized between the two political orientations and the types of sub-mapping used also correspond between them. Both the liberal and the conservative texts contain the metaphors CELL IS COMPUTER, see [40] and CELL IS MACHINE, as in [41]. In addition, the liberal texts also contain one conceptualization of CELL as PRODUCT [42]. Further, both political orientations use the same type of sub-mapping, CELL IS OBJECT, in OBJECTIFICATION metaphors to conceptualize CELL. These are first and foremost metaphors

in which the target, CELL, is conceptualized as an object through the use of the lexeme *create*, as shown in example [43].

[38] […] with proper *coaxing* [of stem cells] in the lab […] (118).

[39] […] divided into more than 250 *cell families* […] (297).

[40] This *reprograms* them into an embryo- like state […] (24).

[41] […] that the fetal cells were *producing* dopamine (475).

[42] […] to *produce* human embryonic stem cells without destroying an embryo (220).

[43] […] they have *created* cells similar to embryonic stem cells […] (132).

[44] […] which encourage research that creates a *market for human embryonic stem cells* […] [261].

There is one occurrence of CELL being conceptualized through the main metaphorical source BUSINESS/MONEY in both sub-corpora, and in both cases it is through the sub-mapping CELL IS MERCHANDISE as seen in [44]. The metaphors used only in the liberal sub-corpus conceptualize CELLS as CONTAINERS FOR HOPE, FIRE HYDRANTS, SOLDIERS and PLANTS. The metaphors that are used only in the conservative sub-corpus and not the liberal conceptualize CELL as TRAVELER and BUILDER.

Table 4.13: Distribution of source domain mappings within the target domain IVF (raw frequency and percentage).

IVF				
	Liberal		Conservative	
Source domain	Rf	% in target domain	Rf	% in target domain
SPORT	6	38	4	25
PERSONIFICATION	2	13	5	31
JOURNEY	1	6	4	25
BUSINESS/MONEY	1	6	1	6
GAME	5	31	0	0
BUILDING	1	6	0	0
NATURE	0	0	1	6

IVF is conceptualized through the use of SPORT, PERSONIFICATION, JOURNEY, and BUSINESS/MONEY in both the sub-corpora. In addition the liberal articles use GAME and BUILDING metaphors, and the conservative texts NATURE metaphors. Hence, the liberal texts contain a wider range of sub-mappings to conceptualize IVF than the conservative texts do. Within the source domain SPORT both political orientations use the sub-mappings IVF IS HUNTING, exemplified in [45], and IVF IS A GAME OF SPORTS as in [46]. The cross-domain mappings involving PERSONIFICATION were realized as IVF IS A PERSON in both the liberal and the conservative texts [47]. JOURNEY metaphors in the conservative texts are used to talk about IVF as a JOURNEY WITH IMPEDIMENTS [48] and an UNEXPLORED AREA [49]. In the liberal texts only the last conceptualization, IVF IS AN UNEXPLORED AREA is paralleled. In each of the sub-corpora there is one mapping of the target IVF with the source BUSINESS/MONEY. For both of the political orientations this metaphor is conceptualized through the sub-mapping IVF IS A BUSINESS [50]. The GAME and BUILDING metaphors in the liberal texts are used to conceptualize the IVF treatment respectively as GAMBLING [51] and BUILDING [52]. The NATURE metaphors used in the conservative texts apply the conceptualization IVF IS AN ANIMAL, as in [53].

[45] […] who instantly agreed to a second egg *retrieval* (439).

[46] Statistically, the first transer would be *their best shot* (334).

[47] It has *touched* the lives of so many people […] (11).

[48] […] overcame one technical *hurdle* […] to discover a method to help alleviate infertility (2).

[49] *Pioneer* of in vitro fertilization wins Nobel Prize (212).

[50] […] perhaps completing their family in a single *transaction* (370).

[51] It's a *roll of the dice […]*(341).

[52] […] would *dovetai*l with the priming of the surrogate's uterus […](326).

[53] […] the *fledging* field (8)

Table 4.14: Distribution of source domain mappings within the target domain PGD (raw frequency and percentage).

	PGD			
	Liberal		Conservative	
Source domain	Rf	% in target domain	Rf	% in target domain
PERSONIFICATION	3	33	2	11
THRESHOLD	2	22	7	39
JOURNEY	2	22	5	28
TOOL	1	11	1	6
MACHINE	1	11	0	0
FIRE	0	0	1	6
NATURE	0	0	1	6
GAME	0	0	1	6

PGD is conceptualized by both political orientations through PERSONIFICATION, THRESHOLD, JOURNEY and TOOL metaphors. In addition, the liberal texts also conceptualize PGD through the use of MACHINE metaphors, whilst the conservative texts contain FIRE, NATURE, and GAME metaphors. The personification metaphors in both the sub-corpora are used to conceptualize PDG as a PERSON, as in [54]. THRESHOLD metaphors are present in both liberal and conservative texts, but are applied more in the conservative ones. In both political orientations it is the sub-mapping PGD is SLIPPERY SLOPE that is applied, [55] and [56]. JOURNEY metaphors are applied across the political orientations; however the sub-mappings used are somewhat dissimilar. In the liberal articles PGD is conceptualized as an UNEXPLORED AREA [57], and AREA [58]. The conservative texts use JOURNEY [59] and UNEXPLORED AREA metaphors. The TOOL metaphors applied to the texts use the sub-mapping PGD IS A TOOL [60]. In the MACHINE metaphor only used in the liberal part of the corpus PGD is conceptualized as a machine that produces babies. The FIRE and NATURE metaphors that are only applied to conceptualize PGD in the conservative texts are PGD IS FUEL [61] and PGD IS A PLANT [62]. There is also one GAME metaphor in the conservative part of the corpus, and it is the sub-mapping PGD IS A GAME that is applied, as in [63].

[54] […] shows the enormous potential of the *young* science PGD […] (387).

[55] […] significant *step towards* a genetic class divide in which the wealthy will be more genetically pure […] (177).

[56] […] dangerous *first step towards* pick-and-choose babymaking? (399).

[57] Many of those *exploring* PGD […] (196).

[58] […] hospitals have *moved* more cautiously *into* preimplantation genetic screening […] (93).

[59] […] to begin their *journey toward* a new family [404].

[60] PGD is a valuable tool […] (419).

[61] Embryos' creation *adds fue*l to stem cell debate (57).

[62] PGD has *grown* slowly […] (417).

[63] Why should her right to procreate *trump* that [the baby's needs] (394).

Table 4.15: Distribution of source domain mappings within the target domain STEM CELL RESEARCH (raw frequency and percentage).

STEM CELL RESEARCH				
	Liberal		Conservative	
Source domain	Rf	% in target domain	Rf	% in target domain
JOURNEY	3	43	7	44
WAR	2	29	2	13
CONTAINER	1	14	1	6
SUBSTANCE/MATTER	1	14	0	0
RELIGION/MYSTERY	0	0	2	13
NATURE	0	0	1	6
THRESHOLD	0	0	1	6
NATURAL FORCES	0	0	1	6
FIRE	0	0	1	6

The target domain STEM CELL RESEARCH is conceptualized through the use of JOURNEY, WAR and CONTAINER metaphors in both the liberal and the conservative part of the corpus. In the liberal sub-corpus there is one occurrence of SUBSTANCE/ MATTER to conceptualize STEM CELL RESEARCH that is not paralleled in the conservative sub-corpus. Moreover, in the conservative texts the sub-domains RELIGION/ MYSTERY, NATURE, THRESHOLD, NATURAL FORCES and FIRE are applied. Both political orientations talk about the target domain by applying JOURNEY metaphors with the sub-mappings STEM CELL RESEARCH IS A JOURNEY, as in [64], the conservative texts also included the sub-mappings STEM CELL

RESEARCH IS A JOURNEY WITH IMPEDIMENTS [65] and STEM CELL RESEARCH IS A VEHICLE [66]. Within the domain WAR the liberal texts use the conceptualization STEM CELL RESEARCH IS A WEAPON [67] and as WAR [68]. In the conservative texts it is only conceptualized as WAR. Both political orientations use the sub-mapping STEM CELL RESEARCH IS A CONTAINER FOR HOPE [69] within CONTAINER metaphors.

[64] Bush's decision will set the *course* of U.S research (447).

[65] But this approach […] doesn't *get around* the problem […] (23)

[66] […] can give federal support to *speed* new discoveries (474).

[67] The stem cell approach is one of several that are *aimed* at getting […] (315).

[68] […] in pursuit of research that could transform the *attack* on disease (293)

[69] […] embryonic stem cells- which *hold the promise* of regenerating disease tissue […] (430).

The RELIGION/ MYSTERY, NATURE, THRESHOLD, NATURAL FORCES and FIRE metaphors from the conservative texts are used with the sub-mappings STEM CELL RESEARCH IS A MYSTERY [70], STEM CELL RESEARCH IS A TREE [71], STEM CELL RESEARCH IS A SLIPPERY SLOPE [72], STEM CELL RESEARCH IS WATER [73], and STEM CELL RESEARCH IS A MATCH [74]. The SUBSTANCE/MATTER token that is only found in the liberal texts is conceptualized through the sub-mapping STEM CELL RESEARCH IS A SUBSTANCE [75].

[70] Stem cells have become the *Aladdin's lamp* of biology, […] (448).

[71] […] chief of stem cell biology with NIH's transplantation and autoimmunity *branch* […] (265).

[72][…] based on concern about a *slippery slope* leading to human cloning.

[73] […] to see this exciting field of biology […] *dried up* in the U.S (457).

[74] […] it is likely to *spark* controversy […] (19).

[75] […] *to shape* stem cell research […] (224).

Table 4.16: Distribution of source domain mappings within the target domain DEBATE (raw frequency and percentage).

DEBATE				
	Liberal		Conservative	
Source domain	Rf	% in target domain	Rf	% in target domain
WAR	3	60	2	40
JOURNEY	1	20	0	0
PERSONIFICATION	1	20	0	0
NATURE	0	0	2	40
BUILDING	0	0	1	20

The target domain of DEBATE is interesting to take a closer look at as it is conceptualized almost exclusively by different source domains across the political orientations. Both the liberal and conservative texts use WAR metaphors to discuss DEBATE, but beyond that they use completely separate domains. The conservative texts contain NATURE and BUILDING metaphors, and the liberal texts contain JOURNEY and PERSONIFICATION metaphors. The WAR metaphors that are applied have the same sub-mapping; DEBATE IS BATTLEFIELD [76]. The JOURNEY and PERSONIFICATION metaphors applied in the liberal texts are DEBATE IS AN AREA [77] and DEBATE IS A PERSON [78]. The NATURE and BUILDING conceptualizations in the conservative texts are realized as DEBATE IS PLANT [79] and DEBATE IS BUILDING [80].

[76] *The battle lines appear to be drawn* between […] (450).

[77] […] nor puts it *beyond* the realm of public debate (114).

[78] […] the moral issue at the *heart* of the controversy (113).

[79] Adding controversy to the *growing* debate […] (427).

[80] […] no one knows this better than the scientists at the *forefront* of the debates (246).

4.1.2 Source domain and main metaphorical source

4.1.2.1 The combined corpus

The variables *source* and *main metaphor* are presented together as they are closely linked and describe the same metaphors only at different levels (subordinate level and superordinate

level). In total 22 main metaphorical source mappings and 98 sub-mappings were found in the corpus. Table 4.17 shows an overview of the raw frequency and percentage distribution by which the main metaphorical source domains occurred, and figure 4.4 depicts the percentage distribution in a bar chart.

Table 4.17: Main metaphorical source domains in corpus (raw frequency and percentage distribution).

| Main metaphorical source	Rf	%	Main metaphorical source	Rf	%
OBJECTIFICATION	80	17	BUILDING	12	3
JOURNEY	77	16	SCALE	10	2
PERSONIFICATION	64	13	FIRE	9	2
CONTAINER	44	9	RELIGION/ MYSTERY	8	2
MACHINE	44	9	NATURAL FORCES	8	2
NATURE	24	5	FOOD	4	1
WAR	20	4	SUBSTANCE/ MATTER	4	1
GAME	21	4	SPATIAL	3	1
BUSINESS/MONEY	16	3	TOOL	3	1
SPORT	13	3	BOOK	2	0
THRESHOLD	12	3	LIGHT AND DARKNESS	1	0
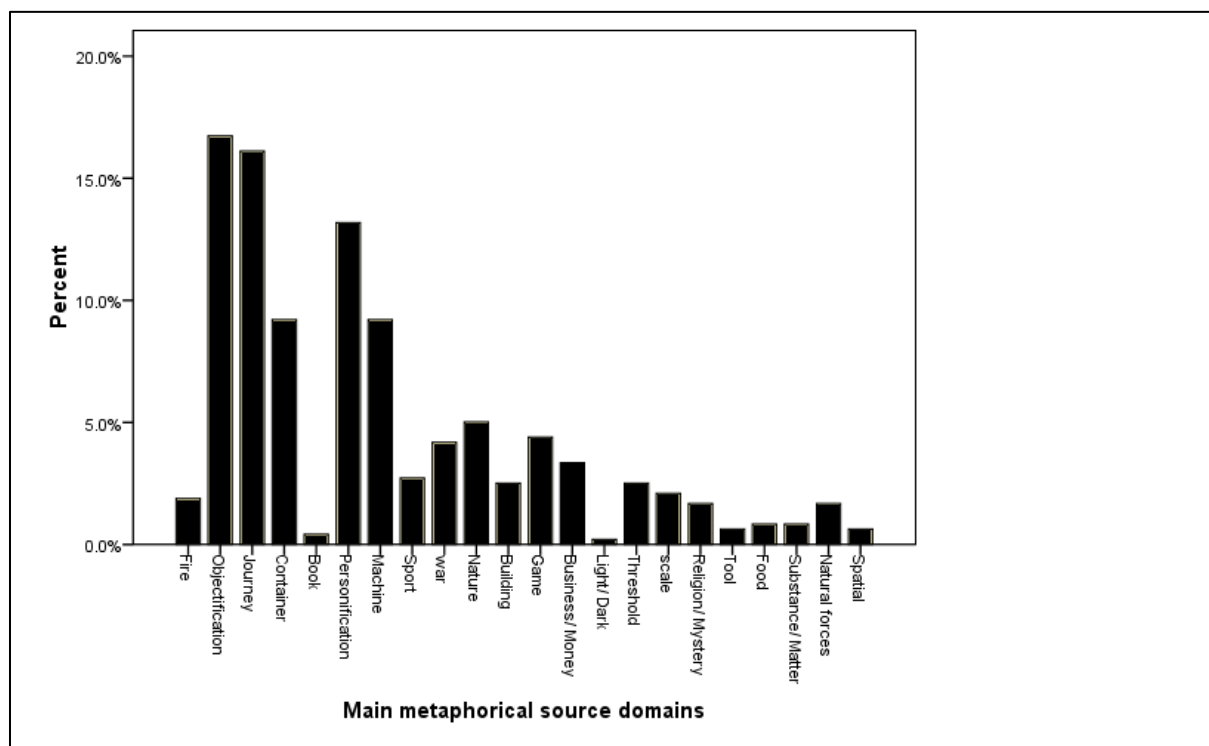
Figure 4.4: Bar chart illustrating the main metaphorical source domains given in percentage scores.

The main metaphorical domains with the highest distribution in the corpus were OBJECTIFICATION with 17 percent, JOURNEY with 16 percent, PERSONIFICATION with 13 percent, MACHINE with nine percent, and CONTAINER with nine percent of all metaphorical tokens. These five domains combined stand for more than half of all the cross-domain mappings in the corpus, more precisely 64 percent. The rest of the main metaphorical source domains together represent 36 percent of the cross-domain mappings. The five main metaphorical source domains are interesting to further examine in order to see what types of target domains they conceptualize, and also, what type of mappings that occur both at the superordinate and the subordinate level. Moreover, it is interesting to see how the types of mappings chosen are distributed across the sub-corpora.

Two additional domains that are interesting to take a closer look at are GAME and THRESHOLD, because they display a significant degree of variation between the political orientations. The GAME domain represents six percent of all the liberal cross-domain mappings, compared to three percent of the conservative cross-domain mappings. THRESHOLD represents four present of the conservative cross-domain mappings, but only one percent of the liberal. Only JOURNEY and PERSONIFICATION display greater variation in percentage distribution within political orientation than these two domains. Section 4.1.2.2 first presents the seven domains in raw frequency and percentage distribution across the political orientations. Then, each domain is described and compared across political orientations for the type of main metaphorical target it is involved in cross-domain mappings with. Each domain is presented in a table, the table first lists the main metaphorical target domains that are found within the sub-corpora, before the domains only found in the liberal sub-corpus are listed, and lastly the domains only found in the conservative sub-corpus are listed. Figures are given in descending order. If the range of the figures does not correspond between the two sub-corpora when the domains that are common to both political orientations are listed, it is the liberal figures that dictate the order.

4.1.2.2 Comparison of the two sub-corpora
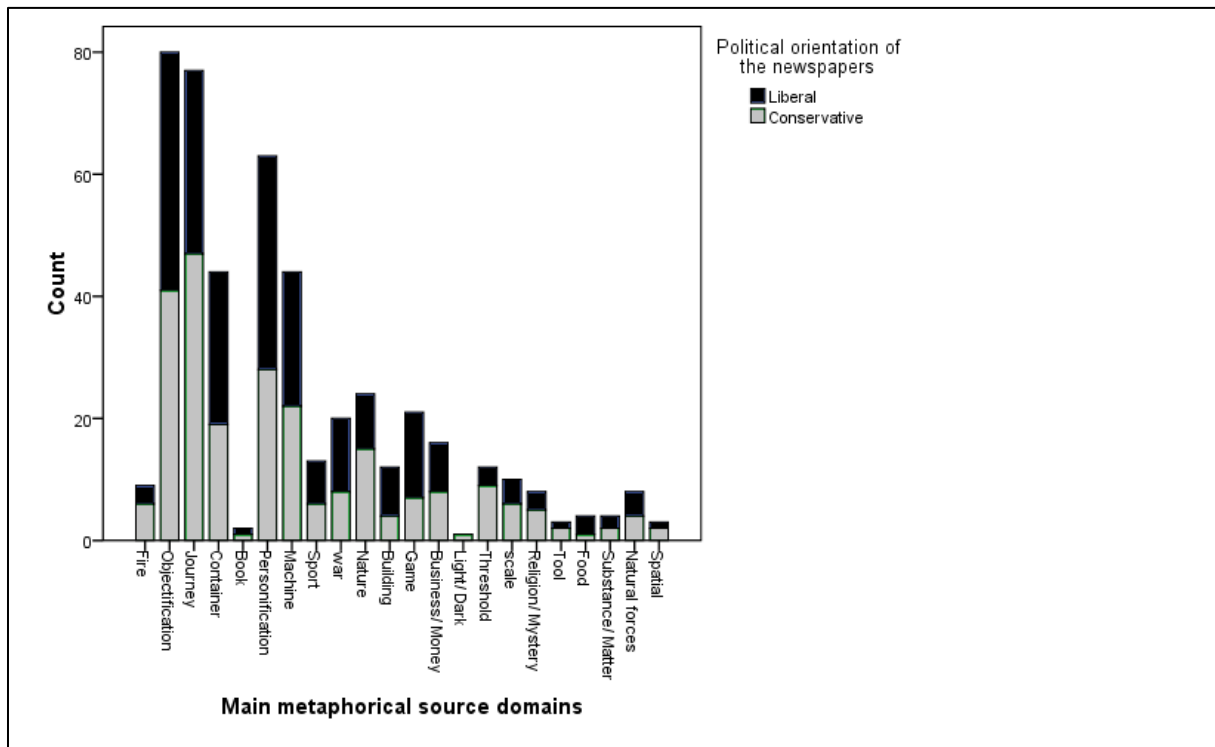
Figure 4.5: Main metaphorical source domains sorted according to political orientation.

Figure 4.5 depicts the main metaphorical source domains that were presented in table 4.17 in percentage distribution across the political orientations. The figure shows that OBJECTIFICATION, JOURNEY, CONTAINER, PERSONIFICATION, and MACHINE metaphors are the main source domains most commonly involved in cross-domain mappings across the political orientations. The domains that display the largest degree of variation between the two political orientations are CONTAINER, PERSONIFICATION and JOURNEY which are involved in cross-domain mappings respectively three percentage points, four percentage points and three percentage points more in the liberal papers than in the conservative ones, and also, THRESHOLD and JOURNEY which were involved in three and five percentage points more cross-domain mappings in the conservative papers than in the liberal ones.

As discussed in section 4.1.1.2 the collapsing of categories, sub-mappings into main metaphorical domains, did not eliminate the occurrences of cases with an expected count equal to or less than five. Within the variable main metaphorical source mapping 46 percent of the cells contained an expected occurrence equal to, or lower than five. Due to the high number of non-valid cases, the Chi-square test could not be applied to the main metaphorical

source domains as a measure of statistical significance. As opposed to the variable main metaphorical target domain (see section 4.1.1.2), the number of invalid cells was so high that running a Chi-square test on a revised cross tabulation would not provide a reliable result. Nonetheless, similar to the main metaphorical target variable, there are reasons to believe that even if the matrix only consisted of valid cases, the material analyzed would not be statistically significant. This assumption is based on the fact that the percentage distribution of main source domains is, generally speaking, equally distributed across the political orientations.

Table 4.18: Most frequently conceptualized main metaphorical source domains (raw frequency and percentage). Distribution within the political orientation.

		Liberal		Conservative
Source domain	Rf	% within sub-corpus	Rf	% within sub-corpus
OBJECTIFICATION	39	17	40	16
PERSONIFICATION	35	15	28	11
JOURNEY	30	13	47	19
CONTAINER	25	11	19	8
MACHINE	22	9	22	9
GAME	14	6	7	3
THRESHOLD	3	1	9	4

Table 4.18 illustrates the five most frequently conceptualized main metaphorical source domains in raw frequency and percentage distribution of the sub-corpora, and also the GAME and THRESHOLD domains which are among the domains that display the largest variation between the two sub-corpora. Out of these five domains JOURNEY is the domain that displays the largest difference between the sub-corpora. Of all the conservative cross-domain mappings, 19 percent are realized within the JOURNEY domain. In comparison, 13 percent of the liberal cross-domain mappings involved the JOURNEY domain. That is a difference of 6 percentage points in favor of the conservative sub-corpus. PERSONIFICATION and CONTAINER also display a significant difference across the political orientations, with respectively four and three percentage points in favor of the liberal sub-corpus. The domains in table 4.18 will be examined more closely in this section to see if there are any similarities

or differences in the sub-mappings the domains are involved in depending on political orientation.

Table 4.19: Cross-domain mappings within the main source OBJECTIFICATION (raw frequency and percentage). Distribution across the political orientations.

	OBJECTIFICATION					
	Liberal			Conservative		
Target domain	Rf	% in domain	% in sub-corpus	Rf	% in domain	% in sub-corpus
BABY	22	56	9	23	58	9
PROCEDURE/FIELD	5	12	2	6	15	2
HUMAN PROC. /PROP.	4	13	2	3	8	1
PREGNANCY	3	8	1	1	3	0
LIFE/SOCIETY	2	5	1	2	6	1
OTHER	1	3	0	1	3	0
MOTHER	2	5	1	0	0	0
MARKET/BUSINESS	0	0	0	0	0	0
DEBATE	0	0	0	3	8	1
HUMAN STATES	0	0	0	1	3	0

OBJECTIFICATON metaphors represent 17 percent of the liberal and 16 percent of the conservative metaphors (table 4.18). Table 4.19 illustrates the different mappings the domain is involved in depending on political orientation. The numbers are given in raw frequency, percentage distribution within the domain, and percentage distribution within the sub-corpus (i.e. the political orientation). For both liberal and conservative texts OBJECTIFICATION metaphors are most frequently applied to conceptualize the domains BABY and PROCEDURE/FIELD. The superordinate metaphor BABY IS AN OBJECT represents for 56 of all OBJECTIFICATION metaphors in the liberal texts and 58 in the conservative texts. Further, for both political orientations this particular cross-domain mapping represents nine percent of all the cross-domain mappings within the sub-corpus. The sub-mappings used across the political orientations are EMBRYO IS OBJECT and BABY IS OBJECT. The first sub-mapping is used two percentage points more in the conservative texts than the liberal ones, and the latter sub-mapping is used two percentage points more in the liberal texts than the conservative ones. The use of this type of metaphor entails a dehumanization and commodification of BABY, as illustrated in examples [2] and [3] in section 4.1. PROCEDURE/ FIELD metaphors are used in the texts with sub-mappings GENE IS AN OBJECT and CELL IS

AN OBJECT by both political orientations, in addition the liberal texts use EGG IS AN OBJECT, and the conservative texts use HUMAN TISSUE IS AN OBJECT and CLONE IS AN OBJECT.

Table 4.20: Cross-domain mappings within the main source JOURNEY (raw frequency and percentage). Distribution across the political orientations.

JOURNEY						
	Liberal			Conservative		
Target domain	Rf	% in domain	% in sub-corpus	Rf	% in domain	% in sub-corpus
PROCEDURE/FIELD	15	50	6	29	62	12
PREGNANCY	6	20	3	3	6	1
OTHER	3	10	1	7	15	3
DEBATE	2	7	1	2	4	1
HUMAN PROC. /PROP.	1	3	0	4	9	2
BABY	1	3	0	1	2	0
HUMAN STATES	1	3	0	1	2	0
LIFE/SOCIETY	1	3	0	0	0	0

As shown in table 4.20, JOURNEY metaphors stand for 13 percent of the liberal and 19 percent of the conservative metaphors. As mentioned initially in this section, JOURNEY is the domain, among the five most frequently used domains, that displays the largest degree of variation between the political orientations. The domain is most often used to conceptualize the main metaphorical target domain PROCEDURE/FIELD across the political orientations. The processes that are dealt with metaphorically in the corpus through the use of JOURNEY are: having a baby with the help of IVF or PGD, and the research into these fields, as well as the field of stem cells. Within the JOURNEY domain there were many different sub-mappings conceptualizing different aspects of the source domain. Some examples are listed below. Examples [81] and [82] deal with the development of the field of medical biotechnology and [83]-[85] deal with the process of conceiving or being pregnant.

[81] […] overcame one *technical hurdle* […] to discover a method to help alleviate infertility (2).

[82] His contributions represent a *milestone* […] (3).

[83] I'm not ready *to move on* […] (76).

[84] At what *point* do we acquire this inviolability? (120).

[85] […] no virtues in letting *nature take its course* when its outcome was potentially dangerous (202).

Example [81] deals with the development of the field of in vitro fertilization and is a sub-mapping of the JOURNEY domain which conceptualizes problems in the process of IVF as hurdles or impediments to the travel. Example [82] conceptualized the development of the field as a journey with a path that has symbols along the way to mark the journey's progression. Hence, the abstract notion of achievements is mapped on to the more concrete tangible source domain *milestone*. Example [83] deals with the dilemma of when to give up the use of fertility treatment and accept that pregnancy is not likely to happen. The main metaphor is that of pregnancy as a destination on a journey, a destination that seems impossible for the traveler to reach, but the traveler is not ready to abandon her current location as this feels closer to the final destination than returning to the starting-point of the journey or moving on to an unknown destination. The metaphor also treats mental state as something physical. The journey of getting pregnant is not as much a physical journey as a mental journey and the location that the traveler is reluctant to leave is a state of mind. Example [84] deals with fetal development and the ethical issue of when a fetus develops into a person. In this metaphor pregnancy is considered a journey and stages of development are conceptualized as locations. Thus, existence or personhood is conceptualized as a certain location. Example [85] also conceptualizes pregnancy as a journey, and deals with the question of whether or not to intervene with nature's work when there is a possibility of getting a child with a hereditary disease, and the means of treating the disease are available. Nature is portrayed as an agent deciding the (unfortunate) course of the journey, parents being the co-travelers or passengers on nature's vehicle.

Table 4.21: Cross-domain mappings within the main source CONTAINER (raw frequency and percentage). Distribution across the political orientations.

	CONTAINER					
	Liberal			Conservative		
Target domain	Rf	% in domain	% in sub-corpus	Rf	% in domain	% in sub-corpus
LIFE/SOCIETY	12	48	5	5	26	2
MOTHER	5	20	2	4	21	2
PROCEDURE/FIELD	5	20	2	4	21	2
BABY	1	4	0	4	21	2
HUMAN PROC. /PROP.	1	4	0	0	0	0
OTHER	0	0	0	2	11	1
PREGNANCY	1	4	0	0	0	0

Metaphors that conceptualize people, objects or events as being containers with an interior, an exterior and a boundary surface (Semino 2008: 95) are termed CONTAINER metaphors. This type of metaphor represents 11 percent of the metaphors in the liberal articles, and eight percent of the metaphors in the conservative articles (table 4.18).The CONTAINER metaphors in both the liberal and conservative part of the corpus are mostly applied to conceptualize and LIFE/SOCIETY, MOTHER and PROCEDURE/FIELD; in addition BABY is conceptualized frequently by the use of CONTAINER metaphors in the conservative sub-corpus. Conceptualizations of LIFE/SOCIETY as a CONTAINER are applied through the sub-mapping BODY IS A CONTAINER, as in [86], in which the body is talked about as having an inside and an outside, and the embryos, fetuses, babies, cells etc. are constructed relative to that, as being inside or outside the container. When CONTAINER is applied in cross-domain mappings with MOTHER it is the woman's uterus, ovaries or womb that is being treated as a container for embryos, fetuses and cells, as in [87] and [88]. The woman's body is thus conceptualized as a container with an inside and an outside, and the embryos, fetuses and cells are either contained by the container or outside of it. In the metaphors in which PROCEDURE/FIELD is the target and CONTAINER is the source it is often processes such as testing the embryos through the use of PGD that are conceptualized, as in [89]. Conceptualizations of BABY as a CONTAINER are mainly EMBRYO IS A CONTAINER FOR CELLS/ CHROMOSOMES/ DISEASE/ GENES [90].

[86] […] an embryo *outside* the human body (6).

[87] We're going to try to put the embryos *right in the middle* [of the uterus] (339).

[88] […] mixing egg and sperm *outside* the body […] (212).

[89] [the test] *carries* a small risk of miscarriage […] (40).

[90] […] each embryo *carried* three sets of chromosomes […] (16).

Regarding the classification of some metaphors (as the ones in [86]-[88]) as CONTAINER metaphors some might not agree that these are used metaphorically since they are referring to the concrete action of physically putting something (an embryo, fetus, cell, egg and sperm) into something else (the female body). The human body is in many ways an actual container for genetic material, or for the child in the making. Nonetheless, I suggest that lexemes such as *inside* and *outside* are used metaphorically rather than literally because when we normally refer to the body as a container for genetic material, embryos or babies it is in relations to natural processes, such as conception and pregnancy, and not the artificial process of IVF treatment. In the course of this artificial process, the genetic material and the human body are involved in a process that actively manipulates the body, and thus treats it as an OBJECT and more specifically a CONTAINER for the genetic material, the embryo or the baby.

Table 4.22: Cross-domain mappings within the main source PERSONIFICATION (raw frequency and percentage). Distribution across the political orientations.

PERSONIFICATION						
	Liberal			Conservative		
Target domain	Rf	% in domain	% in sub-corpus	Rf	% in domain	% in sub-corpus
PROCEDURE/FIELD	22	63	9	21	75	9
BABY	4	11	2	4	14	2
OTHER	3	9	1	1	4	0
DEBATE	1	3	0	1	4	0
HUMAN PROC./PROP.	2	6	1	0	0	0
MOTHER	2	6	1	0	0	0
LIFE/SOCIETY	1	3	0	0	0	0
PREGNANCY	1	3	0	0	0	0
HUMAN STATES	0	0	0	1	4	0

PERSONIFICATION represented 15 percent of the liberal cross-domain mappings and 11 percent of the conservative cross-domain mappings (table 4.18). For both political orientations it is the main metaphorical target domain PROCEDURE/FIELD that is most often

conceptualized through PERSONIFICATION. In the liberal sub-corpus 63 percent of the PERSONIFICATION metaphors were used to conceptualize PROCEDURE/FIELD, the corresponding figure for the conservative sub-corpus is 75 percent. PROCEDURE/FIELD IS A PERSON also represents respectively nine percent of all the metaphors in both sub-corpora. Examples [91]-[94] illustrate some of the sub-mappings within the conceptual metaphor PROCEDURE/FIELD IS A PERSON.

[91][…] shows the enormous potential of the *young* science PGD […] (387).

[92] […] a controversial advance [PGD] *saved* Colleen and her husband, Jerry, from that terrible risk (88).

[93] The procedure, which *marries* the newest genetic treatment and in vitro fertilization [...] (407)

[94] […] physical *demands* of in vitro fertilization […] (180).

In all the examples above non-human entities are assigned human qualities. In [91] PGD is characterized as having a life span, which conceptualizes it as being at the beginning of its development. This involves an image of a process that is not fully matured, and that will still grow and develop. In [93] a combination of two technological procedures is conceptualized as a marriage between two people, a conceptualization that first and foremost involves aspects of cooperation and contentment, but might perhaps also entail conflict or complications. In [92] and [94] PGD and IVF are ascribed human actions and intentions.

Table 4.23: Cross-domain mappings within the main source MACHINE (raw frequency and percentage). Distribution across the political orientations.

MACHINE						
	Liberal			Conservative		
Target domain	Rf	% in domain	% in sub-corpus	Rf	% in domain	% in sub-corpus
BABY	9	41	4	8	36	3
PROCEDURE/FIELD	9	41	4	11	50	5
MOTHER	2	9	1	1	5	0
LIFE/SOCIETY	1	5	0	2	9	1
DEBATE	1	5	0	0	0	0

MACHINE metaphors are not as conventional in the English language as JOURNEY, OBJECTIFICATION, PERSONIFICATION and CONTAINER. Nonetheless, MACHINE is the fifth most frequently used source domain in the corpus, and represents nine percent of all metaphors in both of the sub-corpora (table 4.18). This makes it interesting to see how the MACHINE metaphors conceptualize the domains investigated, and if they are used in similar ways in the conservative and liberal texts. It is the main target domains BABY and PROCEDURE/FIELD that are most frequently conceptualized through the use of MACHINE metaphors in both sub-corpora. The mapping of the main target PROCEDURE/FIELD onto the main source BABY IS A MACHINE stands for 41 percent of the MACHINE metaphors in the liberal corpus, and four percent of all the liberal metaphors. PROCEDURE/FIELD IS A MACHINE represents an equal number of metaphors. In the conservative corpus the BABY IS A MACHINE stands for three percent of all the metaphors and 36 percent of the MACHINE metaphors. PROCEDURE/FIELD IS A MACHINE represents 50 percent of the MACHINE metaphors and five percent of all conservative metaphors. Some examples of BABY IS A MACHINE and PROCEDURE/FIELD IS A MACHINE are given below.

[95] […] can identify sperm samples most likely to *produce* either a boy or a girl (97).

[96] […] it would take a village to *manufacture* their child (360).

[97] […] spermatogonial cells, which *churn* out sperm throughout the life of the male (138).

[98] This *reprograms* them [cells] into an embryo- like state […] (24).

In examples [95] and [96], BABY is conceptualized as a PRODUCT that is produced in the process of fertility treatment. The lexemes *produce* and *manufacture* create connotations to commercial processes, and *manufacture* particularly implicates large-scale production and emphasizes the de-humanizing aspect of the process of *producing* a baby. These types of metaphors are closely linked to metaphors that conceptualize BABY as an OBJECT. In [97] CELL is conceptualized as a MACHINE that *churns* out sperm, and in [98] CELL is conceptualized as a computer that can be programmed and *reprogrammed* to have different functions.

Table 4.24: Cross-domain mappings within the main source GAME (raw frequency and percentage).
Distribution across the political orientations.

	GAME					
	Liberal			Conservative		
Target domain	Rf	% in domain	% in sub-corpus	Rf	% in domain	% in sub-corpus
PROCEDURE/FIELD	10	71	4	6	86	3
PREGNANCY	1	7	0	1	14	0
DEBATE	1	7	0	0	0	0
BABY	1	7	0	0	0	0
HUMAN PROC. /PROP.	1	7	0	0	0	0

As mentioned in the beginning of this section, GAME metaphors are not of the domains most frequently involved in cross-domain mapping. Nevertheless, it is among the domains that demonstrates the largest difference in percentage distribution across the political orientations. This makes it interesting to further examine if differences also exist in the types of mappings and sub-mappings used by the conservative and liberal newspapers. Table 4.24 demonstrates that both political orientations chose GAME metaphors mostly to conceptualize PROCEDURE/ FIELD with 71 percent of the liberal GAME metaphors and 86 percent of the conservative GAME metaphors are being used in this type of cross-domain mapping. Examples of this are found in [51] and [63]. PREGNANCY is also conceptualized through the use of this main source domain across the political orientations, but to a much smaller degree (due to rounding the percentage score is 0), as illustrated in example [36]. Moreover, the liberal sub-corpus also uses GAME in cross-domain mappings with DEBATE, BABY and HUMAN PROCESSES/PROPERTIES. Hence, the liberal newspapers use GAME metaphors in a wider range of mappings and sub-mappings than the conservative newspapers, and it is here the difference in percentage distribution can be found. Within the mapping PROCEDURE/FIELD IS A GAME both political orientations use the sub-mappings FERTILITY TREATMENT IS GAMBLING and CONCEPTION IS GAMBLING. In addition the liberal texts also contain the sub-mappings CONCEPTION IS A GAME and IVF IS GAMBLING, whilst the conservative texts contain the additional sub-mapping PGD IS A GAME. The sub-mapping used within the superordinate metaphor PREGNANCY IS A GAME is PREGANANCY IS GAMBLING in both sub-corpora. The mappings of DEBATE, BABY and HUMAN PROCESSES/PROPERTIES to GAME that only occur in the liberal sub-corpus are realized as MORAL ISSUES ARE CARDS

IN A CARD GAME, EMBRYOS ARE PLAYERS IN A GAME and CONCEQUENCES ARE
GAMBLING.

*Table 4.25: Cross-domain mappings within the main source THRESHOLD (raw frequency and
percentage). Distribution across the political orientations.*

THRESHOLD						
	Liberal			Conservative		
Target domain	Rf	% in domain	% in sub-corpus	Rf	% in domain	% in sub-corpus
PROCEDURE/ FIELD	2	67	1	8	89	3
DEBATE	1	33	0	1	11	0

THRESHOLD metaphors also display a rather large difference between the two sub-corpora.
The metaphor is primarily used by both political orientations to conceptualize the
PROCEDURE/ FIELD domain, and then especially PGD. The conservative newspapers use 17
percentage points more THRESHOLD metaphors to conceptualize PGD than the liberal
newspapers (see table 4.14). The sub-mapping that is used is PGD IS A SLIPPERY SLOPE in
both sub-corpora [55] and [56]. In addition the conservative sub-corpus also conceptualizes
STEM CELL RESEARCH as a SLIPPERY SLOPE, as in [73].The metaphors that are used to talk
about the DEBATE through the use of THRESHOLD metaphors treat ETHICAL
BOUNDARIES as a LINE that needs to be drawn, and a THRESHOLD that can be crossed.

4.1.3 Word class

The variable word class was included in the analysis in an effort to collect as much information as possible about the metaphorical tokens in the corpus. Due to time constraints and considerations of space in this thesis word class will not be discussed at any length. Still, some results of the variable will be presented shortly in this section.

Table 4.26: Cross tabulation word class/ political orientation.

			Word class of metaphorical token				
			Noun	Verb	Adjective	Preposition	Total
Political orientation of the newspapers	Liberal	Count	82	130	10	12	234
		% within Political orientation of the newspapers	35	56	4	5	100
		% of Total	17	27	2	3	49
	Conservative	Count	98	123	11	13	245
		% within Political orientation of the newspapers	40	50	5	5	100
		% of Total	21	26	2	3	51
Total		Count	180	253	21	25	479
		% within Political orientation of the newspapers	38	53	4	5	100
		% of Total	38	53	4	5	100

Table 4.27: Cross tabulation word class/ name of newspaper.

			Word class of metaphorical token				
			Noun	Verb	Adjective	Preposition	Total
Name of newspaper WSJ		Count	32	45	5	5	87
		% within newspaper	37	52	6	6	101[3]
	BG	Count	12	41	5	4	62
		% within newspaper	19	66	8	7	100
	NYT	Count	29	42	4	6	81
		% within newspaper	36	52	5	7	100
	WT	Count	23	31	2	4	60
		% within newspaper	38	52	3	7	100
	LAT	Count	41	47	1	2	91
		% within newspaper	45	52	1	2	100
	CT	Count	43	47	4	4	98
		% within newspaper	44	48	4	4	100
Total		Count	180	253	21	25	479
		% within newspaper	38	53	4	5	100

The majority of cross- domain mappings in the corpus, 53 percent, included a verb or a verb phrase. Nouns and noun phrases represented 38 percent of the metaphorical mappings. Adjectives and prepositions were applied far less with respectively four and five percent of the metaphorical mappings. The word classes are applied in similar frequencies across the sub-corpora as in the combined corpus, and there are no large differences between the political orientations. However, as is shown in table 4.27, there are some differences between the newspapers within the political orientations. Looking at the liberal newspapers, the *Los Angeles Times* uses approximately the same percentage points of verbs as nouns in cross-domain mappings (seven percentage points more verbs than nouns). The *New York Times* uses 16 percentage points more verbs than nouns in cross-domain mappings. The *Boston Globe* articles, on the other hand, use 47 percentage points more verbs than nouns in metaphorical

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[3] Total not equal to 100 due to rounding.

expressions. The conservative newspapers does not display the same variation, it is the *World Street Journal* that displays the largest difference in the use of verbs and nouns with 15 percentage points more verbs involved in cross-domain mappings than nouns. The *Washington Times* apply 14 percentage points more verbs than nouns, and in the *Chicago Tribune* the difference is only four percentage points. The papers use of adjectives and prepositions does not show any specific differences within or across the political orientations.

4.1.4 Chain metaphor

Chain metaphor, similarly to word class, was included in the analysis in an effort to compile further information about the metaphorical tokens. Like the variable word class, the time constraints and lack of space limits the discussion of the chain variable, but some results will be briefly presented in this section.

Table 4.28: Cross tabulation metaphorical chain/ political orientation.

| | | | Metaphorical chain | | |
			No chain	Chain	Total
Political orientation of the newspapers	Liberal	Count	227	7	234
		% within Political orientation of the newspapers	97	3	100
	Conservative	Count	236	9	245
		% within Political orientation of the newspapers	96	4	100
Total		Count	463	16	479
		% within Political orientation of the newspapers	97	3	100

Chain metaphors were applied to the corpus texts to a very limited degree, and were consistent between the political orientations. There were some variations between the newspapers within each orientation, but these were minor.

4.2. Discussion

This section discusses the results presented in the descriptive analysis (section 4.1) in relation to the research questions. The aim is to tie together section 4.1 with the questions investigated in order to establish if the use of metaphor can be said to be linked to newspapers' ideology, and how the choice of metaphor can affect the image projected of the target domains investigated. This last question will be given extra focus. I will start off by answering research questions a) and b), before I move on to question c) to discuss how the results found in the first two questions might influence the way the target domains are perceived. Although I have not conducted an empirical investigation of audience responses to newspapers' conveyance of ideology through metaphor, I will consider how the choice of metaphorical source and target domains found in the corpus may affect the image projected of the domains in question. As mentioned in section 3.3, the results found in this thesis can only reveal some very basic and general tendencies and not say something about the newspapers' view on specific issues. However, these tendencies can perhaps be an indication of how the papers use metaphor as a vehicle for conveying ideology.

4.2.1 Main metaphorical source and target domains

In the 30 articles examined in this thesis the abstract and poorly delineated main metaphorical target domains BABY, MOTHER, PREGNANCY, PROCEDURE/ FIELD, DEBATE, HUMAN STATES, LIFE/SOCIETY, MARKET/BUSINESS, HUMAN PROCESSES/PROPERTIES and OTHER are conceptualized through the use of the more concrete, clearly delineated main metaphorical source domains FIRE, OBJECTIFICATION, JOURNEY, CONTAINER, BOOK, PERSONIFICATION, MACHINE, SPORT, WAR, NATURE, BUILDING, GAME, BUSINESS/ MONEY, LIGHT/ DARK, THRESHOLD, SCALE, RELIGION/MYSTERY, TOOL, FOOD, SUBSTANCE/ MATTER, NATURAL FORCES and SPATIAL.

Out of the main metaphorical source domains it is OBJECTIFICATION, JOURNEY, PERSONIFICATION, MACHINE and CONTAINER that are most frequently chosen by both political orientations to conceptualize the target domains in question. Together these domains represent 64 percent of all the metaphors in the corpus (table 4.17). OBJECTIFICATION, JOURNEY, PERSONIFICATION and CONTAINER are source domains that are highly conventionalized in the English language and often used within different types of discourse. It is therefore not surprising that they also are used richly in the discourse of biotechnology and bioethics. MACHINE metaphors are also conventionalized, but they tend to be more discourse

specific to the discourse of the body, the mind and our physical and mental health, and thus are also expected in the type of discourse examined in this thesis. However, that the domains are conventional in general and within the field does not diminish their potential ideological effect. On the contrary, we know that highly conventionalized metaphors are considered to be efficient rhetorical devices as they are often not recognized as metaphors. This is due to the fact that we are so used to thinking and taking about different concepts in terms of these domains that it is considered to be the *natural* way of thinking and talking about them (see section 2.1).

In addition to these five domains, the GAME and THRESHOLD domains that were examined more closely in section 4.1.2.2 displayed a certain degree of variation between the liberal and the conservative newspapers compared to the other main metaphorical source domains. Both domains are fairly common within scientific discourse and THRESHOLD is especially common within the discourse of biotechnology. GAME metaphors are used more in the liberal texts than in the conservative ones, and are used to talk about procedures or situations in terms of gambling by using lexemes such as *stakes, odds* and *roll of the dice.* Conceptualizing biotechnology as a competition constructs an image of winners (the ones that successfully conceive) and losers (the ones that are not able to conceive). In this binary division of those involved in the process there is also an additional element involved, namely money. Whereas some can afford to keep on *gambling* even though the *stakes are high* and the *odds* may not be good, others have to *fold.* THRESHOLD metaphors are used more in the conservative texts than in the liberal ones. They are used to convey the fears of the current development of the field, that it is moving too rapidly and not giving us time to discuss the potential consequences of the development (see section 2.3). This difference between the political orientations may be an indication that the liberal texts construct the field of biotechnology more in terms of a competition, while the conservative papers are more concerned with the dangers of the development.

Although the domains mentioned above have been considered separately in the analysis, some of them are closely linked. As discussed in section 3.2.2 MACHINE and CONTAINER metaphors are considered special cases of OBJECTIFICATION metaphors, as machines and containers are types of objects. However, they have been considered separately in this thesis because they are among the most frequently used OBJECTIFICATION metaphors. Furthermore, THRESHOLD metaphors are considered a special case of JOURNEY, but because scientific discourse is known to be ripe with this type of metaphor the THRESHOLD domain is also considered separately in the thesis. In the further discussion these domains will

be discussed in relation to each other, as they evoke similar associations and involve the same type of evaluation and valuation of concepts.

Table 4.18, which illustrates the percentage distribution of the most frequently conceptualized main metaphorical source domains, shows that there is a difference between the sub-corpora in which domain is the most used in cross- domain mappings. In the liberal newspapers it is OBJECTIFICATION metaphors that are most commonly used (17 percent), followed by PERSONIFICATION (15 percent), JOURNEY (13 percent), CONTAINER (11 percent) and MACHINE (nine percent). In the conservative newspapers on the other hand it is JOURNEY (19 percent) metaphors that are most commonly used, followed by OBJECTIFICATION (16 percent), PERSONIFICATION (15 percent), MACHINE (nine percent) and CONTAINER (eight percent. There is thus a difference of six percentage points between the sub-corpora in their use of the JOURNEY domain. This difference occurs because the conservative texts to a much larger degree than the liberal texts use JOURNEY metaphors to conceptualize PROCEDURE/ FIELD. The fact that JOURNEY is used more often to conceptualize PROCEDURE/ FIELD is interesting since it is the most frequently conceptualized main metaphorical target domain by both political orientations.

In all the PROCEDURE/ FIELD sub-mappings that were examined in section 4.1.1.2, (CELL (table 4.12), IVF (table 4.13), PGD (table 4.14) and STEM CELL RESEARCH (table 4.15)), the conservative texts consistently use more JOURNEY metaphors than the liberal texts. They use source domains such as UNEXPLORED AREA for the procedures and the field, JOURNEY WITH IMPEDIMENTS for the development of the field, DESTINATIONS for the desirable outcomes, PAVING THE WAY for some of the techniques within the field, and TRAVELERS for the scientists. Most of these source domains are also used in the liberal texts, but not to the same degree. This might be an indication that the conservative newspapers to a greater extent than the liberal ones want to convey an image of the biotechnological field and its procedures as is in the making or early stages of development, and that the direction it is heading in is not yet known. As discussed earlier (section 2.1), metaphor highlights some aspects of a domain whilst hiding others, thus discovering an unexplored area could be considered to be exiting and a great opportunity or on the other hand dangerous and with unknown consequences. JOURNEY is known to be a metaphor that is used to conceptualize progress and development, and is often used in terms of positive development, as in e.g. *we will get there*, *we will reach our destination* and *it was a long and winding road, but we are finally where we wanted to be*. In this case, however, the conservative newspapers large use of

JOURNEY metaphors compared to the liberal papers has to be seen in connection to their use of THRESHOLD metaphors, which is discussed in section 4.2.2 below. THRESHOLD metaphors are used to express concern about the direction a development is taking, and are closely related to JOURNEY metaphors. Therefore, the use of JOURNEY in the conservative texts can be said to be used to conceptualize PROCEDURE/ FIELD as something unexplored and therefore also uncertain. Hence, the JOURNEY metaphors express concern about the development of the field. The potential effects of conceptualizing the field of biotechnology and bioethics as JOURNEY will be further discussed in section 4.2.3.

PROCEDURE/ FIELD is not only the most frequently conceptualized domain but also the domain that is conceptualized through the widest variety of sub-mappings. The liberal newspapers use 18 different sub-mappings within the main metaphorical source domain, and the conservative newspapers use 17 different sub-mappings. The fact that many different types of sub-mapping are used within the main metaphorical mapping is an indication that many different aspects of PROCEDURE/ FIELD are dealt with metaphorically. This is very interesting. One reason might be that the main theme of all the articles is procedures and processes, and as a natural consequence more metaphors are applied to conceptualize these concepts than others. Nonetheless, there is also reason to believe that the different aspects of PROCEDURE/ FIELD are frequently involved in so many cross-domain mappings because they are fairly abstract and technical concepts that are removed from our everyday experience. Hence, they are harder to grasp and are thus conveyed through metaphor in order to bridge the gap between the scientific language and lay people's everyday language. This coincides with Petersen's (2005) notion that metaphor is vital to scientific discourse as a language of communication between the scientist and the public (section 2.3).

In sections 4.1.1.2 and 4.1.2.2 it was demonstrated how a Chi-square test was not reliable as a test of statistical significance because several cells contained an expected occurrence of figures equal to or lower than five. Nonetheless, a Chi-square test was run on the main metaphorical target domains, after the cross tabulation had been cleared of non-valid cases. This test indicated that the difference between the liberal and conservative newspapers was not statistically significant. This seems to be a plausible result, also for the unrevised cross-tabulation, as both the *main metaphorical target* and *main metaphorical source* variables display strong similarity in percentage distribution of most domains across the political orientations. Furthermore, similarity is also found between the political orientations when looking at the most commonly used single conceptual metaphors for each of the sub-corpora. For the combined corpus it was the conceptual metaphors BABY IS AN OBJECT,

PROCEDURE/ FIELD IS A JOURNEY and PROCEDURE/ FIELD IS A PERSON, all with 9 percent of all metaphors, which were most frequently used in the texts examined. These findings are reflected in the sub-corpora as well. BABY IS AN OBJECT and PROCEDURE/ FIELD IS A PERSON each accounted for nine percent of the liberal metaphors, whilst PROCEDURE/ FIELD IS A JOURNEY represented six percent of the liberal metaphors. In the conservative sub-corpus 12 percent of the metaphors were found to be under the superordinate metaphor PROCEDURE/ FIELD IS A JOURNEY. BABY IS AN OBJECT and PROCEDURE/ FIELD IS A PERSON both represented 9 percent of all the conservative metaphors. Hence, it is the same type of conceptual metaphors that are used most frequently by both political orientations, but with a difference in percentage distribution of three percentage points for the metaphor PROCEDURE/ FIELD IS A JOURNEY, in favor of the conservative newspapers. This is consistent with the results discussed above, that JOURNEY is chosen to a larger degree to conceptualize PROCEDURE/ FIELD in the conservative sub-corpus than in the liberal.

Overall there are no apparent significant differences between the political orientations in the choice of metaphorical domains. The largest difference is found in the use of JOURNEY to conceptualize PROCEDURE/ FIELD. A possible reason for this absence of variation might be the fact that scientific discourse is loaded with new and unfamiliar terms and that scientists therefore use metaphors to convey development, results and technological advances. Newspapers tend to adopt the language of scientific discourse when reporting on biotechnological issues. Thus the choice of metaphors involved is also adopted, perhaps not down to its minute details, but as broader patterns of metaphorical mapping. Hence, newspapers with different ideological standings may end up using similar metaphorical mappings, because there is no range to choose from.

Based on the results discussed in this section, it is clear that the liberal and the conservative newspapers in general do prefer the same types of superordinate metaphorical mappings in their conceptualization BABY, MOTHER, PREGNANCY, PROCEDURE/ FIELD and DEBATE. They also use the domains with a similar frequency. It is probable that the result from the Chi-square test run on main metaphorical source and main metaphorical target domain would have generated the same results as the Chi-square test on the revised cross tabulation of main metaphorical target domains and political orientation of the newspapers (table 4.4) had it been considered reliable (no cells equal to or under five). Meaning that the results of the test would not have refuted the null-hypothesis, and the differences between the political orientations at the level of superordinate mapping would not be considered statistically significant. Nevertheless, this does not mean that there are no differences between

the liberal end the conservative papers in their choice of metaphorical mappings. It only indicates that the differences are not to be found at this level of metaphoricity. For that reason, it does not appear to be the *type* of metaphors chosen that distinguishes the political orientations; rather it seems to be the subtle variations in *how* the metaphors are used. These variations are located at the subordinate level and can be found by looking at the diverse sub-mappings that are grouped within the main metaphorical source and main metaphorical target domains. The differences found at the sub-mapping level between the political orientations were presented in sections 4.1.1 and 4.1.2, some of these results will be further discussed in the following sections.

4.2.2 Comparison at the sub-mapping level

As illustrated in tables 4.8 to 4.16, when it comes to most commonly conceptualized target domains the difference is not to be found in percentage distribution of the main metaphorical source domains, but rather in the subtle distinctions in the type of sub-mapping used within the main metaphorical source. Nonetheless, also at the sub-ordinate level the political orientations display a large degree of similarity when it comes to their choice of cross-domain mappings. I this section I will attempt to highlight some of the most important differences found at the subordinate level. This will be done by looking at some of the target domains listed in table 4.7.

EMBRYO (table 4.8) reveals some differences between the liberal and conservative sub-corpora in their choice of sub-mapping within the MACHINE domain. The conservative texts use the sub-mappings EMBRYO IS A PRODUCT and MACHINE, whilst the liberal texts prefer EMBRYO IS MATERIAL and WASTE MATERIAL. As discussed in section 4.2.1, MACHINE metaphors are in principle special cases of OBJECTIFICATION metaphors. Therefore, all these sub-mappings involve a conceptualization of the EMBRYO as an OBJECT, and thus also a dehumanization and commodification of human life. The sub-mappings within the MACHINE domain used to conceptualize EMBRYO in both sub-corpora involve thinking and talking about the embryo in terms of an object or a thing that can be manipulated by humans and used for human purposes. However, the types of sub-mappings used do involve some subtle differences between the two political orientations in the type of associations they evoke. The conservative PRODUCT is the sub-mapping that evokes the most 'neutral' associations, to the extent that it is possible to talk about 'neutral' associations within an OBJECTIFICATION metaphor. PRODUCT gives associations of a refined manufactured article of a certain market value, a consumer product that is in demand. The PRODUCT, the

EMBRYO, is thus considered an object of a certain value, which can be bought and sold. EMBRYO IS A MACHINE, MATERIAL and WASTE MATERIAL are used in the corpus to denote the use of embryos to produce stem cells for research. Stem cells are highly valued in biotechnology as a possible means of curing a number of diseases, and the way these sub-mappings are used implies that the embryos in question do not have any real value in themselves, but only acquire worth in the sense that they can be used in the process of producing stem cells. The embryos themselves are thus not considered to be the valuable PRODUCT, they are conceptualized as the less valuable raw material that goes into the process of producing the final refined PRODUCT, which in this case is the stem cells. In the cases where the embryo is not fit as MATERIAL for stem cell production it can simply be thrown away, as WASTE MATERIAL. According to Goatly (2007: 102), the use of commodification metaphors is especially worrying within the field of reproduction and genetics. The danger in talking about EMBRYOS as OBJECTS is that we also start thinking of them as objects, and thus start treating them as objects. Objects do not have that inherent inviolability that human beings do, and thus talking and thinking about embryos as objects instead of as potential human beings weakens moral obligations towards the embryos, and opens up for a market of dealing in embryos and other reproductive and genetic material. This will be discussed further in section 4.2.3.

The same type of difference in valuation is found in the NATURE metaphors chosen by the conservative newspapers, EMBRYO IS A PLANT, and the liberal metaphors EMBRYO IS A PLANT and EMBRYO IS A WEED. The use of the PLANT sub-mapping is fairly neutral compared to the sub-mapping EMBRYO IS WEED, which is used in the sub-corpus to discuss the use of PGD for removal of embryos carrying unwanted diseases. The exact phrase used is 'to use PGD to *weed* out embryos […]'. The first entry of 'weed' in the OED is 'A herbaceous plant not valued for use or beauty, growing wild and rank, and regarded as cumbering the ground or hindering the growth of superior vegetation'(Oxford English Dictionary, accessed 22 April 2012). Using this type of mapping involves evaluations of the 'sick' or 'abnormal' embryo as something that is not only undesirable and unwelcome, but hindering the development of a 'healthy' or 'normal' embryo. Again, this way of talking and thinking of the embryo diminishes the moral dilemma brought on by removing or discarding an embryo based on its genetic profile. It seems that although both political orientations use the same source domains, MACHINE and NATURE, to conceptualize EMBRYO, the sub-mappings chosen by the liberal newspapers involve valuations of the target domain that are slightly more negatively loaded then the ones chosen by the conservative newspapers.

In the conceptualization of BABY there seems to be an interesting difference between the political orientations. The conservative texts use the metaphor BABY IS MERCHANDISE which is not paralleled in the liberal texts, and the liberal texts use BABY IS A GIFT (FROM GOD) which is not represented in the conservative texts. Similarly to the sub-mappings of EMBRYO discussed above, both sub-mappings treat the child as an object, but there is a difference in the type of object that the concept BABY is conceptualized as. The main difference seems to lie in the intended purpose of the object. The main objective of merchandise is sale. Merchandise is often mass produced and made in order for someone to profit from the creation. Thinking of a child as a gift from God on the other hand, involves a valuation of the 'object' in question as valuable and much wanted. As opposed to the *merchandise* the *gift* is appreciated for its inherent worth, not for its potential market value.

It seems somewhat reversed from what one would expect that the conservative sub-corpora use conceptualizations of BABY as MERCHANDISE in cases where the liberal sub-corpora do not. However, in closer examination of the tokens it is apparent that the MERCHANDISE metaphors are not used as representations of the papers' view, but rather used to represent someone else's view and also to express fear of a potential outcome of the new biotechnological development. The first token is given in [99] below. It is taken from the *Wall Street Journal* and deals with the stigma some women feel when receiving fertility treatment after a certain age. The second token is given in example [100], it is taken from the *Washington Times* and is used to express fear that PGD could lead to the commodification of children, and that some parents will use the procedure as a means of picking certain qualities for their child. Hence the way the BABY IS A MERCHNADISE is used by the conservative texts it cannot be said to reflect the papers' ideology, but rather what they consider someone else's ideology to be.

[99] Our supposedly arrogant delay […] has put us in a pickle, and now we're *buying* our way out (57).

[100] Will such methods be used only to cure the sick, or will parents use the procedure [PGD] for *custom-ordered* children? (238).

When it comes to the main metaphorical target domain IVF, the political orientations use some dissimilar source domains and sub-mappings. For example, in the liberal sub-corpus IVF is conceptualized through the use of the GAME domain and the sub-mapping GAMBLING

in which the outcome of the process is treated as a *gamble* that is measured in *odds*, involving *stakes* and *rolls of the dice*. As discussed in section 4.2.1 this way of conceptualizing IVF may be unfortunate as it entails representing some patients as winners, taking home a baby *or the prize,* whilst others, who do not get to take home a baby, are conceptualized as losers. On the other hand, the use of GAMBLING metaphors may also be an expression of the uncertainty that is linked to the process involved; there are no certain answers and no guarantees of a positive outcome. In the conservative corpus it is the NATURE metaphor IVF IS AN ANIMAL that is used in which the field of IVF is talked about both as a *fledging* and as casting *spawn.* The notion of a *fledging* field brings to mind something that is in the course of development, and *casting spawn* gives associations of further development and branching out. By closer examination the tokens are used to debate the early development of IVF in the 1970's. In the conceptualization of PGD it is the conservative newspapers that apply the sub-mapping GAMBLING and this time it is not paralleled in the liberal newspapers.

THRESHOLD metaphors through the use of the sub-mapping SLIPPERY SLOPE are used to conceptualize PGD 17 percentage points more in the conservative texts than the liberal texts (see table 4.14). Also, within the domain STEM CELL RESEARCH the conservative texts contain a conceptualization of PGD as a SLIPPERY SLOPE that is not found in the liberal texts. This is interesting as the slippery slope metaphor is used to express skepticism and fear about the direction the development is headed in. As discussed in section 2.3, the slippery slope metaphor entails that allowing the instant case, for example stem cell research, which in itself might not be seen as dangerous, will inevitably lead to a undesirable danger case because there is no logical difference between the two cases. Allowing one means that we have to allow the other as well because there is no logical way to separate the two. There is no line where the instant case ends and the danger case begins. In this case the undesirable danger case might be human cloning or so called *designer babies*.

The fact that slippery slope metaphors are found to a greater extent in the conservative newspapers might be an indication that the conservative newspapers are more skeptical towards the technology that is being discussed and the direction the biotechnological development is taking. Moreover, it is also worth noting that whilst PGD is conceptualized as a slippery slope in both the sub-corpora, and STEM CELL RESEARCH is conceptualized as a slippery slope in the conservative sub-corpus, the domain IVF is not conceptualized through the use of threshold metaphors at all. Might this be due to the fact that IVF is a more established, better known procedure that has been around long enough to prove that allowing it did not lead to other unwanted procedures? After all the first IVF baby, Louise Brown, was

born as early as 1978 while Adam Nash, the first PGD baby or *donor baby*, was not born until the year 2000. The time span since IVF was first introduced up until today may possibly have contributed to the normalization of IVF technology, making it less daunting and thus less likely to be part of a slippery slope metaphor. Following the same logic, IVF might not be part of slippery slope metaphors because it is no longer the instant case, it has been allowed for a long time. PGD and stem cell technology are thus the new instant cases and are therefore the subject of slippery slope metaphors. The difference displayed between the two political orientations could, arguably, be linked to the newspapers' ideology. According to Wibren van der Burg in the article *The slippery slope argument,* the slippery slope argument is not used equally by conservatives and liberals. He suggests that while the slippery slope is popular among conservatives, and acts like a traditionalist *trump card,* it is feared among liberal reformers for its rhetorical power (Van der Burg 1991: 42). Van der Burg does not develop this notion further, but he goes on to discuss the validity of the slippery slope argument in the law and in morality. He concludes that while the argument's validity is strong within the context of the law, it has limited validity within morality. Still, it is frequently applied to debate ethical issues, something that the author credits to the slippery slope's rhetorical powers and its wide reaching appeal to the public.

There appear to be differences between the two political orientations at the subordinate level. The clearest difference is found in the sub-corpora's percentage distribution of the sub-domain SLIPPERY SLOPE. Nevertheless, it is important to keep in mind that the differences found are only present in low numbers and do not emerge in clear patterns. It is possible that this absence of a clearly delineated difference between the political orientations is caused because the newspapers representing both political orientations are limited in their metaphorical choices to the metaphors applied in scientific discourse. That is not to say that there are no other metaphors available to conceptualize the target domains, but the metaphors that are used by scientists in scientific discourse are highly conventional to the point that they are sometimes conceived of as the *normal* way of talking about a concept. Take for example the way we talk about electricity through the use of metaphors such as wave, flow, current etc. These conceptualizations of the highly abstract notion of electricity are pervasive in our everyday language and are the *normal* way of referring to the concept, thus it is also conceived to be an accurate description of the concept as opposed to a metaphorical comparison. According to Liakopoulos, the recurring metaphorical themes within the media's debate concerning the field of biotechnology do not denote a lack of imagination in the debate. Rather, he states, it occurs because '[…] the imagery invented in the previous decades

has grown strong roots in the general debate.' This notion is supported by Semino, who argues that metaphors that have become the dominant way of talking about a particular concept are often hard to challenge because they have become the natural and commonsense way of thinking and talking about the concepts in question (2008: 33). Additionally, choosing conventional metaphors above novel ones appears to be a favorable rhetorical strategy for the newspapers as conventional metaphors are preferable over novel ones at conveying latent ideology.

4.2.3 Choice of metaphor and possible implications

Lakoff and Johnson suggest that metaphors are so powerful that they may create or define our reality, and especially our social reality, through hiding and highlighting. Further, it is not just our way of viewing reality that is shaped, but also our consequent actions (2003: 156). They state that '[i]n most cases, what is at the issue is not the truth or falsity of a metaphor but the perceptions and inferences that follow from it and the actions that are sanctioned by it' (2003: 158). In short, metaphors shape thought and action, and what kind of metaphors are used in the medias' discourse of biotechnology, and how they shape thought is therefore very important, as there is a possibility that they at the same time shape actions.

I will now discuss the results of the combined corpus in relation to how the choice of source domains may affect the image projected of the target domains. Even though there were few clearly defined differences in how the liberal and conservative newspapers conceptualize BABY, MOTHER, PREGNANCY, the biotechnical PROCEDURE/ FIELD and the DEBATE that could be linked to the newspapers ideological standing, it is interesting to consider what kind of associations their common choices of source domains creates, and thus the image of human beings and humanity it brings to the debate. Certainly, the metaphors they use are not neutral or objective description of facts, they involve evaluations and valuations of the target domains that are in no way free of ideological undertones.

In section 2.1 I discuss how metaphors, through their qualities of hiding and highlighting, make powerful rhetorical tools by directing our line of thought in certain directions and away from others, and by doing so the metaphors limit our imagination. This notion is further developed by Coleman and Ritchie who write that 'when message frames are narrow, audiences are more likely to embrace the semantic package with little cognitive scrutiny' (2011: 30). In other words, a message that is framed through the use of many metaphors within the same, or closely linked domains is more likely to be accepted without being recognized as a rhetorical or discursive device. As mentioned in section 4.2.1 the five

most frequently conceptualized main metaphorical source domains represented 64 percent of all the metaphors in the corpus. Thus, the message frame in the corpus is quite narrow. Over half of all the metaphors in the corpus are conceptualized by only five source domains. It is possible that this consistent, repeated conceptualization of target domain within the same source domains contributes to limiting imagination and naturalizing the use of the metaphors in question, thus making them harder to recognize as metaphors and easier to accept as the *natural* language and as the normal way of talking about the concepts.

OBJECTIFICATION metaphors, including CONTAINER and MACHINE, are the domains used most frequently throughout the combined corpus. Moreover, the most frequently used single conceptual metaphor in the combined corpus is BABY IS AN OBJECT. The domains evoke associations to objects, non-living things that can be subjected to manipulation through movement and force. The sub-mappings that are sorted under OBJECTIFICATION in the corpus are primarily expressed through the use of the lexemes *create* and *make* in relations to children in the process of IVF or PGD. These lexemes are used metaphorically because they have a more basic meaning that refers to the act of *creating* or *making* inanimate objects rather than children. As discussed in the previous section, talking and thinking about babies, embryos, fetuses etc. as objects involve a valuation of these as things rather than potential human beings with an inherent worth. The same type of evaluation and valuation occurs when CONTAINER metaphors are used to talk about the same concepts as for instant *containers for cells*, or *containers for DNA,* or MACHINE metaphors are used to conceptualize them as *product, computers, machines*, *material* and *waste material*. These types of conceptualization lead to a commodification of human beings and the genetic 'components' involved in reproductive technology (Goatly 2007). One of the possible dangers of talking of humans as commodities is that they are then assigned value, and thus some may be considered more valuable than others. In other words, talking about embryos and cells from embryos as material for stem cell research involves valuing already existing life over life in the making.

In the corpus we also find conceptualizations of MOTHER as MACHINE and BODY as MACHINE. In *The metaphor of risk: biotechnology in the news*, Petersen points out that the use of MACHINE metaphors within several fields, including biotechnology to describe the body and its functions leads to a neglect of the relationship between the mind and the body, and can have a significant effect on the way that patients are viewed and treated (2005a: 204). In relation to this thesis, talking about the mother and her body as a machine in the process of IVF and PGD might cause the focus to be primarily on fixing the *defect component* or

reprogramming her system, and consequently overlooking her emotional and psychological needs. Hence, talking about the mother as a machine sanctions treating her like a machine. Goatly builds on this notion by saying that there is a large number of metaphors that construct humans as objects and an increasing trend for commodification in the areas of reproduction and genetics. Moreover, he claims that the commodification of human beings, by for example talking about them as machines or as related to production, is something that benefits the large biotechnological companies and their shareholders because it entails assigning human beings and genetic material a market value. This may lead to a way of thinking in which body parts are replaced by spare parts, and parents can shop the market for the best genetic material for their children (2007:117).

JOURNEY and THRESHOLD metaphors are also used to a large degree in the combined corpus, but slightly more in the conservative texts than the liberal ones. For both political orientations it is PROCEDURE/ FIELD that they are used to conceptualize. I have discussed earlier in this chapter how JOURNEY metaphors are both highly pervasive and conventional in the English language. They can be found in a range of discourse types such as politics, science, education, literature etc. This is due to their versatile nature. The domain has an array of possible sub-mappings to represent different aspects of the JOURNEY (see section 2.1). This makes it possible to use the domain both to conceptualize progress, stagnation and recession, different modes of travel can be used to symbolize the pace of the development, and people involved can be conceptualized as leaders, followers, explorers, refugees etc. Hence, there are endless possibilities within the scope of the metaphor. The versatile nature of the domain also makes it easily compatible with other domains such as MACHINE and CONTAINER, for example by conceptualizing different vehicles as modes of travel and areas or groups of people as CONTAINERS.

In this thesis the JOURNEY metaphors are primarily used to conceptualize the development and progress of biotechnology. The field is constructed as an *unexplored area* and the development as a *journey* with a cure or solution as its *destination*. Hindrance to the development is constructed as *impediments* to the journey, and sometimes the journey takes *a turn* towards something undesirable and ends up *crossing a line* which eventually leads to a *slippery slope*. As discussed in section 4.2.1, the JOURNEY metaphors in the conservative texts, combined with THRESHOLD metaphors, convey the possible dangers concerning the direction in which the development is heading. Hence, the possible negative consequences are highlighted, whilst possible positive consequences are downplayed. Considering that the choice of metaphor can limit imagination by directing thought to certain aspects instead of

others this one sided conceptualization of the field may leave lay people, who get most their information about science through the media, with a rather unbalanced picture of this piece of reality. Although there are potential dangers with the development of techniques such as PGD and the use of stem cells, they also carry great potential for curing many of the diseases we today consider to be fatal. Using metaphors to convey the field brings the focus to parts of reality, but without providing a complete picture. The choice of metaphor thus determines the focus of the debate and act as a conveyer of a certain group's beliefs, thoughts and action, in other words, their ideology.

5. CONCLUSION

5.1 Summary and conclusion

The present thesis has examined how six daily American newspapers conceptualize the target domains BABY, MOTHER, PREGNANCY, PROCEDURE/ FIELD and DEBATE within the field of biotechnology, the aim being to investigate whether the choice of metaphor is connected to the newspapers' ideology. This was done by analyzing 30 articles from newspapers that could be said to represent two different political ideologies, that is, conservatism and liberalism. The papers examined were the *Wall Street Journal*, the *Washington Times* and the *Chicago Tribune*, which are considered to be conservative, and the *New York Times*, the *Los Angeles Times* and the *Boston Globe* which are considered liberal newspapers. The articles were analyzed using the Metaphor Identification Procedure to identify metaphorical conceptualizations of the target domains investigated. The metaphors were coded at two levels, first for the sub-mapping at the subordinate level and then for the main metaphorical domain at the superordinate level. This enabled an in depth analysis, not only of what *type* of metaphors were chosen to conceptualize the field, but also of the more subtle nuances of *how* these metaphors were used.

The analysis conducted in this thesis produced a large number of results. Due to time constraints and considerations of space not all of these results have been commented upon or discussed as thoroughly as would have been preferred. I have focused on presenting and discussing the results that emerged as particularly interesting. Nevertheless, this selection of results is considered to be an adequate representation of the overall results and provides the foundation for answering my research questions.

The outcome of the analysis revealed that there were more similarities between the way liberal and conservative newspapers conceptualize the target domains than there were differences. At least at the superordinate level, that is. They apply the same broad variation of cross-domain mappings at the main metaphorical level and it is the same domains that are most frequently used by both political orientations, though there was a difference as to which domain was the most used. While the liberal papers seem to prefer OBJECTIFICATION metaphors it is JOURNEY that is most frequently involved in cross-domain mappings in the conservative papers, and for both the sub-corpora it was the target domain PROCEDURE/ FIELD that was most often conceptualized. In chapter 4, I discussed how the large degree of similarity found between the sub-corpora might be due to the conceptual frames set by scientists in their discourse regarding the field.

The most significant finding is that the differences are not located at the superordinate level, but rather at the more detailed level of sub-mappings. Hence, the newspapers might chose the same metaphors, but use them differently to frame their message by highlighting and hiding, so that it supports their system of beliefs. The differences found at the level of sub-mapping did not occur in clearly delineated patterns, but they did indicate some trends. The conservative newspapers use more THRESHOLD metaphors and especially SLIPPERY SLOPE metaphors in their texts than the liberal newspapers. In this sense the conservative newspapers project a darker image of the field than the liberal papers do, emphasizing the potential dangers and downplaying the advantages. Further, the types of sub-mappings chosen by the liberal newspapers lead to projections of BABY that seem to be dehumanizing to a larger degree than the corresponding sub-mappings in the conservative newspapers. The differences that were established were found in the details of how the sub-mappings were used to hide some aspects of a domain whilst emphasizing others. Based on this finding it is likely that the more detailed the analysis is, the more differences will be found between the political orientations in their use of conceptual metaphors.

There have been quite a few studies on metaphor in biotechnology and in science more generally. These studies have looked at the types of metaphors used, at patterning, frequency and the possible effects the types of conceptualization may have on the public. Some studies have also investigated the media's use of metaphors to portray scientific development. To my knowledge there has not been carried out a similar study at several levels of metaphoricity to examine how metaphor is used to express ideology in the news media. In the introduction I presented three research question related to the aim of this thesis, based on the analysis that has been conducted I can conclude that:

a) The main metaphorical source domains FIRE, OBJECTIFICATION, JOURNEY, CONTAINER, BOOK, PERSONIFICATION, MACHINE, SPORT, WAR, NATURE, BUILDING, GAME, BUSINESS/ MONEY, LIGHT/ DARK, THRESHOLD, SCALE, RELIGION/MYSTERY, TOOL, FOOD, SUBSTANCE/ MATTER, NATURAL FORCES and SPATIAL ORIENTATION are used to conceptualize the target domains investigated. Of these domains it is OBJECTIFICATION, JOURNEY, PERSONIFICATION, MACHINE and CONTAINER that are used most frequently.

b) There are differences in the liberal and conservative newspapers use of metaphor. These differences are first and foremost found at the sub-mapping level. The newspapers choice of type of metaphor is very similar, but when examined closer it is

clear that there are subtle differences in how these metaphors are used. The more detailed the analysis, the clearer the differences become.

c) The choice of metaphorical domains in both the sub-corpora constructs an image of the human beings and the genetic material involved in the biotechnical procedures as commodities by repeatedly and systematically conceptualizing them as objects. This tendency is stronger in the liberal sub-corpora than in the conservative sub-corpora. Additionally, the conservative papers' use of JOURNEY and THRESHOLD metaphors combined constructs the development of the field, and especially of PGD and stem cell research, as unclear and with possibly frightening consequences.

5.2 Implications of the study and further research

Some interesting findings have been made in this study that could be further explored. As this study looked at a broad range of American newspapers and included 30 articles, it would be interesting to study further if similar results are found applying a more narrow scope. One possibility could be a smaller qualitative study, looking into how one particular issue of biotechnology is portrayed in one liberal and one conservative newspaper, to investigate if the choice of metaphor is connected to the newspapers' ideological standing. This narrow scope would enable a much more detailed analysis than the one I have conducted in this thesis, and could possibly provide more insight into how the metaphors are exploited at the sub-mapping level to create and sustain belief systems. Cases that could benefit from this type of study are for example the use of stem cells to create so called *savior siblings* or perhaps the use of PGD for gender selection or for embryo selection to sidestep hereditary diseases.

Another area which ought to be pursued is the use of slippery slope metaphors in the media's debate on biotechnology. As the use of slippery slope metaphors shows a noticeable difference between the two sub-corpora examined in this thesis, it would be interesting to examine this type of metaphor especially to investigate how it is linked to newspaper ideology. Possible angles are to examine how the slippery slope metaphor constructs the argument, whether it is used with or without modifiers such as *could possibly*, *might* and *will maybe* and how this is related to the political orientation of the newspaper. Moreover, the frequency of slippery slope metaphors used within medical biotechnology and reproductive technology could be compared to other scientific fields to see whether some areas of science are particularly prone to using the metaphor as an ideological tool.

One of the findings in the thesis is that there is indeed a commodification going on in

the field of reproductive and genetic technology and ethics across the political orientations. As a further development of this study I believe that the field of cognitive linguistics could benefit from a further study of audience responses to the use of objectification metaphors and threshold metaphors within the field of biotechnology. This could shed some light upon how efficient the newspapers choice of metaphor actually is to convey their belief systems. Do audiences respond to their hidden ideology or does metaphor fail in its task as an ideological medium?

5.3 Final remarks

In sum, this thesis has provided some insight into how metaphor is used to sustain ideology and has established that there is a difference in how newspapers with different political orientations use metaphors to get their message across. Especially interesting is the notion that the use of metaphor to create and sustain ideology is not apparent to the naked eye, but requires a more thorough examination in order to be found. As a vehicle of ideology metaphor is hard to notice. This is partly because the subtle differences in how metaphor is used, which construct the ideological framework, take place at such a detailed level of metaphoricity, and partly due to the highly conventional nature of the metaphors chosen. These two factors combined are what make metaphor highly successful as a tool to convey groups' ideological convictions.

6. APPENDICES

Appendix A

Corpus articles given in number of words and publication date.

New York Times		
Article	**Words**	**Date**
Wanting babies like themselves, some parents choose genetic defects	1279	05.12.2006
Couples cull embryos to halt heritage of cancer	3565	03.09.2006
Pioneer of in Vitro Fertilization Wins Nobel Prize	1383	05.10.2010
Stem cells without embryo loss	389	26.08.2006
Test can tell fetal sex at 7 weeks	1235	10.08.2011
Total	**7851**	

Boston Globe		
Article	**Words**	**Date**
A very early checkup: screening of embryos	1735	10.12.2001
A man's right to choose	1479	26.03.2006
Embryo ethics	2089	08.04.2007
Germans announce stem-cell advance	955	25.03.2006
A mother and child union; Trading cells	1341	08.05.2001
Total	**7599**	

Los Angeles Times		
Article	**Words**	**Date**
Ovarian cancer risk increases after IVF	708	27.10.2011
Biology: An immortal cell	1389	29.07.2001
San Diego company studies stem cell implant as a Type 1 diabetes treatment	966	30.05.2011
Shots, eggs, embryos and a big dose of hope	5677	30.10.2006
Ready to be dads, but they're going to need help	6768	29.10.2006
Total	**15508**	

Wall Street Journal		
Articles	**Words**	**Date**
In Vitro Pioneer Wins Nobel	744	05.10.2010
Cloning offers stem-cell hope	844	06.10.2011
New Prenatal Tests Offer Safer, Early Screenings	993	28.06.2011
My fertility crisis	3076	23.07.2011
Appeals court tackles stem-cell dispute	427	06.12.2010
Total	**6084**	

Washington Times		
Article	**Words**	**Date**
Alzheimer's-screened birth fosters 'designer babies' fear	825	05.03.2002
85 out of 100 embryos wasted	496	13.09.2005
Moral Questions Dog Stem-Cell Research	1577	16.04.2001
Empty womb; Infertility work-up can find cause, determine treatment	1863	25.03.2001
Multiple changes; In vitro guidelines to reduce number of eggs used	776	23.06.2004
Total	**5537**	

Chicago Tribune		
Articles	**Words**	**Date**
Gene test spares baby from defect	1205	27.02.2002
Gender selection technology raises many ehical issues	1228	25.02.2005
Birth puts embryo testing in spotlight	1264	08.06.2001
Embryos' creation adds fuel to stem cell debate	918	11.07.2001
The stem cell Once again	2262	29.07.2001
Total	**6877**	

Appendix B

Target domains sorted under main metaphorical target domains

BABY

  TEST-TUBE BABY

  EMBRYO

  BABY

  FETUS

MOTHER

  MOTHER

  UTERUS

  WOMAN

PREGNANCY

PREGNANCY

PROCEDURE/ FIELD

  IVF

  TECHNIQUE

  GENE

  STEM CELL RESEARCH

  HUMAN TISSUE

  CELL

EGG

PATIENTS

TEST

FERTILITY TREATMENT

CONCEPTION

PGD

CLINIC

SPERM

FIELDS

ORGANS

BLOOD

MEDICINE

HAVING A BABY

TECHNOLOGY

DEVELOPING THE FIELD

CLONE

CELL NUCLEI

GENETICS

BIOTECHNOLOGY

STUDY

REPRODUCTIVE MEDICINE

SCIENCE

CELL DEVELOPMENT

GROWTH FACTOR

IMMUNE SYSTEM

GENETIC MATERIAL

HORMONE

SCIENTISTS

BIOLOGY

FETAL TISSUE

MEDICAL TREATMENT

GENDER

DNA

DEVELOPMENT

MAKING A BABY

SAFE TREATMENT

CURING INFERTILITY

CURE

DEBATE

MORAL ISSUES

DEBATE

RIGHTS

ARGUMENTS

COMMUNICATION

ETHICAL ISSUES

VALUE

ETHIC

OPINION

ETHICAL BOUNDARY

DILEMMA

MORAL

HUMAN STATES

 DISAPPOINTMENT

 DESIRE

 EMOTION

 EMOTIONAL STATE

 EXISTANCE

LIFE/ SOCIETY

 LIFE

 PEOPLE

 SOCIETY

 FAMILY

 IDENTITY

 BODY

 MARKET/ BUSINESS

 DEMAND

 MONEY

 INCREASE IN DEMAND

 MEDIA COVERAGE

HUMAN PROCESSES/ POSESSIONS

 ACHEIVEMENT

 CONCEQUENCES

BAD DECITIONS

IGNORANCE

PROPERTIES

POSSIBILITY

CHANCE

NEEDS

ACHEIVEMENT

CONCEQUENCES

BAD DECITIONS

IGNORANCE

PROPERTIES

POSSIBILITY

CHANCE

NEEDS

ATTENTION

HOPE

WISH

CHOICE

PURPOSE

RESPONSIBILITY

KNOWLEDGE

DECITIONS

UNDERSTANDING

INTELLIGENCE

FIGURING OUT

CHANGE

<u>OTHER</u>

TIME

MORE

ROLE

NATURE

CRACKS

GUIDELINES

SOLUTION

ADVANCEMENT

PROBLEMS

TO CAUSE

IMPORTANT

IMPLICATION

THE DEVELOPED WORLD

Appendix C

Source domains sorted under main metaphorical source domain.

<u>FIRE</u>

MATCH

ELECTRIC TENSTION

EXPLOTION

FIRE HYDRANT

FUEL

FLAMABLE OBJECT

<u>OBJECTIFICATION</u>

OBJECT

HEAVY OBJEVT

VALUABLE OBJECT GARMENT

<u>JOURNEY</u>

UNEXPLORED COUNTRY/ AREA

JOURNEY WITH IMPEDIMENTS

JOURNEY

OPEN PATHS

DESTINATION

AREA

LOCATION

SHELTER

COUNTRY

VEHICLE

KEY

STEP

PAVING THE WAY

LOCATION

TRAVELERS

CONTAINER

CONTAINER

CONTAINER FOR EMBRYOS

CONTAINER FOR LIFE

CONTAINER FOR CHROMOSOMES

CONTAINERS FOR DNA

CONTAINER FOR RISK

CONTAINER FOR CELLS

CONTAINER FOR HOPE

CONTAINER FOR GENES

CONTAINER FOR DISEASE

BOOK

BOOK

PERSONIFICATION

PERSON

FAMILY

MACHINE

COMPUTER

COMPUTER OPERATOR

MACHINE

PRODUCT

WASTE MATERIAL

MATERIAL

CODE

SPORT

GOAL

WRESTLING

HUNTING

GAME OF SPORTS

WAR

WAR

ADVERSARIES

SOLDIER

BATTLEFIELD

NATURE

PLANTS

YOUNG BIRD

FISH

WEED

TREE

FIELD

ANIMAL

BUILDING

BUILDING

BUILDERS

GAME

GAMBLING

GAME

CARDS IN A CARD GAME

PLAYER

BUSINESS/ MONEY

BUSINESS

MERCHANDISE

COSTS

MONEY

PRIZE

TIMETABLE

JOB

LIGHT/ DARK

DARKNESS

THRESHOLD

SLIPPERY SLOPE

THRESHOLD

LINE

SCALE

HEAVY

VEIGHTS ON A SCALE

SCALE

RELIGION/ MYSTERY

GIFT

MYSTERY

DEALS WITH THE DEVIL

PUZZLE

TOOL

TOOL

<u>FOOD</u>

RESTAURANT

INGREDIENTS

<u>SUBSTANCE/ MATTER</u>

SUBSTANCE

HANDELING

<u>NATURAL FORCES</u>

WATER

NATURAL FORCE

<u>SPATIAL</u>

UP

TO RAISE

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