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Steven Matthew Stearmer
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A European Case Study on the Intersection Between Public and Private Space:

Increasing Breastfeeding Rates in a Modern World

S. Matthew Stearmer

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Science

Dr. Chad F. Emmett

Dr. Valerie M. Hudson

Dr. Samuel M. Otterstrom

Department of Geography

Brigham Young University

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ABSTRACT

A European Case Study into Increasing Breastfeeding Rates in a Modern World:
Breastfeeding and The Convergence of Public and Private Space

S. Matthew Stearmer

Department of Geography

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Health organizations around the world, from international bodies of government to local advocacy groups, are pushing the benefits of breastfeeding. While this is commendable, no study has ever been completed to assess on a regional scale the available policy options and their effectiveness at producing increased breastfeeding rates. It is my contention that five key factors influence the effectiveness of breastfeeding policies in Europe; Acceptance of public breastfeeding, maternity resource commitment, legal protection of breastfeeding in public and business space, a united voice in favor of breastfeeding, and limitations to formula advertisements in hospitals on media outlets. These five factors influence how successfully mothers navigate public and private space as they choose to breastfeed their children. In my effort to assess the contextual factors and policies that create an environment conducive to long term breastfeeding rates I am also interested in discovering a set of factors that do not increase the economic vulnerability of women. The emperical analysis derived from data from the WomanStats Database found that a combination of five conditions; social acceptance of public breastfeeding, maternal resource commitment, legal protection of breastfeeding, united voice in favor of breastfeeding, and laws regulating the sale of formula were all necessary in order to produce higher breastfeeding rates in Europe. The data also shows that when countries pursue these five factors female income disparity is not negatively impacted.

ACKNOWLEDGEMENTS

When I began my education it was my assumption and desire to go it alone and prove to the world my worth as an individual - as if help from anyone else would have revealed some weakness of character. The ridiculousness of that assumption is glaringly apparent now. I would like to not only confess and apologize for that arrogance to all of those who have helped me on this journey, but also formally acknowledge to the world my debt to them.

First, to Janille, my wife and love of my life, I would like to thank for her constant support encouragement, intellect, and editing abilities. If there is anything worthwhile in this thesis is it because of her. Second, Valerie Hudson, for her continuous input, support. I cannot expresses my appreciation in words for your presence in my life and research. To my committee at large, I appreciate your patience and input that have helped me develop into a better scholar. I wish to also express thanks to the Geography department for their support though the year with funding and encouragement to finish. To the WomanStats team, I love you all, and could not imagine working on anything else more important. I am eternally grateful for your sacrifice of time and energy into finding and recording all of the data that makes research like this even possible. And finally I would like to thank my children Conner, Savannah, Emmaline, Tess and Isaac, whose support I have desperately needed and who's love is so unconditional that it has lifted me even in the most challenging times.

Special Thanks

WomanStats was created with the vision to be the most comprehensive database on the status of women in the world. It is unmatched in its breadth and depth of information already accumulated. Data in and of itself is powerful, but visibility is the key issue. Where data is hidden, it is valued only by a few. Much like these wonderful organizations, the data is scattered, and ill used, and fractured in study. Currently however all of this data is slowly being collected, under one banner as it were. This thesis and the idea presented gain strength by the statistics available in the WomanStats database – they would not be possible otherwise. Scales, indices, and causal relationships are already being demonstrated and established though the WomanStats database. In a sense, WomanStats has the potential to become the symbolic representation for the uniting of all of these various advocacy groups. It has the power to bring to light data that hitherto has often just collected dust on shelves or in minds. It is an interesting phenomenon that so many of contributions that women make are hidden, so much of the data that proves this is hidden, and most of the organizations that work on these issues are little known. The challenge of our day, and of the WomanStats project, will be to bring into clear focus these causal relationships that will bring to the forefront the importance of women to the health of the overall society. Breastfeeding polices are an example of an area where WomanStats may be the catalyst for significant change in the public perception and action towards breastfeeding. By bringing together a composite of various international, national and local level data from a variety of sources it is now possible to conduct research and reveal more significant connections than have been previously available.

That which is united becomes visible. That which is visible becomes valued. That which is valued becomes powerful.

Brigham Young University

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of a thesis submitted by

S. Matthew Stearmer

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_____	_____
Date	Chad F. Emmett, Committee Chair
_____	_____
Date	Samuel M. Otterstrom, Committee Member
_____	_____
Date	Valerie M. Hudson, Committee Member
_____	_____
Date	Perry J. Hardin, Graduate Coordinator
_____	_____
Date	Susan S. Rugh, Associate Dean. Family, Home and Social Sciences

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Introduction

Breastfeeding. The word instantly conjurers in most people a preconceived attitude of when and where it is appropriate. Next to breathing and sleeping, it is possibly the most common natural phenomenon that must occur in the life of a young child. And yet despite its supreme importance in the development of a child, the modern world is often ill-equipped to facilitate its regular and sustained implementation. The main problem comes at the nexus of public and private space and social norms. Many nations have developed a schizophrenic position on women in their societies. Women who act as women are accepted in the public sphere and now enjoy participation (even if in disparate numbers) in virtually every apsect of life. Women who act as mothers are also accorded a certain domain over which they have a great deal of control or autonomy, but that sphere is conceptualized as private. Unfortunately the world is not so easily divided. Regardless of whether a mother is to work or not she will still enter the public sphere on a regular basis while also being required to act as a mother. Something as simple as going out to eat can become a major event. A mother eating in a restaurant who also needs to breastfeed her child, will be faced with the tension between the public and private spheres and will potentially face social sanctions for breaking any societal norms. She has to make a choice on which norms of which sphere will she conform. The intersection of the public and private is not an isolated event, and it occurs in even greater frequency in our modern world.

We live our lives governed by social norms that dictate when an activity is acceptable in public versus private space. Notions of public and private space have changed over time, but they are always present. There are no societies that have a complete convergence of the public and private and as soon as there is a division choices must be made on how to navigate the social norms. Our current world is one that asks women to be both women and mothers but has not

done a great job supporting them in these overlapping roles. Breastfeeding presents a wonderful opportunity to explore how the public and private spaces are navigated. I will argue that the study of breastfeeding policies and measures can significantly contribute to our understanding of the convergence of the public and private space and also contribute to the small but growing field of empiricist feminism. Specifically I will make the case that increasing the social acceptance of public breastfeeding, increasing the legal protection of breastfeeding mothers in the public sphere, investing in their personal security, and managing the breastfeeding messages in the public sphere will be associated with higher rates of breastfeeding regardless of the country's historical or cultural background and that these gains in increased breastfeeding rates will not correspond to a drop in economic security for the mothers. In effect I am proposing a template by which the public and private may be combined to meet the needs of both mother and child.

In order to demonstrate this connection I will use Europe as a case study. Europe presents a complicated mixture of different political systems (especially as concerns degree of democratization and history of freedom), religiosity, income, tradition, and language, among other things. While each of these nations are quite different, most of them, including all of the European Union members, have ratified EU regulations regarding the promotion of breastfeeding rates in their countries (Van Den Broecke 2009). But the pressure has not been all one-sided in favor of breastfeeding. Over the last few years there has been a resurgence of caution and restraint levied against "Breast Is Best" type campaigns. Critics have expressed some valid concerns that need to be addressed if countries are to continue their current push towards higher breastfeeding rates while at the same time not putting mothers at disadvantage. The interplay of all of these factors creates a perfect environment in which to observe how certain policies and

factors might affect breastfeeding rates across a diverse backdrop of nations in the twenty-first century.

The outline of the paper is as follows. In my literature review, section 1.1, I will review the literature on public vs. private space and empiricist standpoint feminism, ending with a brief historical context of the breast milk vs. formula debate (1.2). I will then present the case against the active promotion of breastfeeding (1.3) and then will give the position in favor of promoting favorable breastfeeding policies (1.4). While sections 1.3 and 1.4 will cover principles, costs, and benefits that are part of the breastfeeding debate on both sides of the argument, I freely admit that I am biased, for I am in favor of breastfeeding and the active promotion of breastfeeding. I will acknowledge the problems brought up in section 1.3 and they are incorporated into section 1.5, which covers the contextual factors and policies that should make up a comprehensive breastfeeding promotion strategy. Specifically this section will set up the theoretical framework for the proposed models. The vast majority of breastfeeding policies do seem to me to be myopic. Current breastfeeding campaigns generally do not approach solving the problem of how to improve long-term breastfeeding rates from a comprehensive perspective and instead rely upon one or two policy changes and/or cultural pressures to achieve higher rates. In a changing environment of decreasing cost of formula, increasing pressures and desires for women to enter into the workforce, and the waning influence of religion and culture in a secularized and individualistic world, can these types of minimalist programs hope to maintain or increase the breastfeeding rates? Section 1.6 will detail the scales and operationalizations that will be used in the analysis of what factors appear to be associated with increases in breastfeeding rates in the European countries. Section 1.7 will analyze the general trends that are visible for each variable and any regional patterns discovered. This will contribute to the statistical analysis that will

follow in section 1.8. Section. 1.9 will contain observations about the statistical analysis results and will also address anomalies and and patterns in the data. I will conclude with summary of the findings in section 1.10.

Section 1.1 Literature Review

Geographers have contributed several important concepts to social science more broadly conceived. While geography tends to look at environmental or social phenomenon over larger spatial distances, large distances are not required in order for geography to aid our analysis. Waldo Tobler proposed the first Law of Geography in 1964 that "Everything is related to everything else, but near things are more related than distant things" (2004). This proposed law has influenced everything from GIS programming to our understanding of humanistic geography. Geographic principles of diffusion over space reveal patterns in large scale analyses such as migration patterns and diffusion of technology as articulated by Jared Diamond in his Pulitzer prize winning book Guns, Germs and Steel (1999). How we interpret space and interact within that space can have a profound impact on everything from economics (Curry 1964, 1976, 1989) to cognitive behavior (Golledge 2002, 1993, 1992) and anthropology (Morrill 1987, 1975, 1970).

While these large scale patterns have been critical to our understanding of space they have also obfuscated micro level phenomenon and the creation of space on a lesss grand scale. Yi-Fu Tuan argued that humanistic geography should seek to cast light onto areas hitherto hidden from the outside purview, or the felt quality of the space, and contends that there is space only when there is movement between one place to another and place requires space - but this does not have to be over great distances (2003, 1977, 1976). This is a critical understanding as

we move into a discussion of public vs. private space. The introduction of people and culture onto space creates opportunities for individuals to interact in a very personal dimension of space while at the same time occupying publicly created space. One of the arguments I wish to make from a theoretical perspective is that this intersection can happen in the same space when the only thing that moves is the definition action and whether it is acceptable in public or private space. A single action can affect our perception of space in very profound ways.

This portion of the paper will seek to fulfill Yi-Fu Tuan's challenge to bring hidden things to light and add to the literature of how things that are closer together are related. I will do this by further exploring the nature of public and private space.

Section 1.1.1 Public vs. Private

Susan Hanson argues that gender is constructed on a daily basis and in the interactions of our everyday lives. She also contends that gender develops in certain places and circumstances (1992, 572). This is an important function of place to understand. The implication is that our understanding of place may significantly alter how we "do" gender (Michael Kimmel 2000, 116), and also because of our gendered expectations, our perceptions of the place itself can be altered. When place is overwritten by gendered perceptions then we may fall victim to Joy Parr's warning that when we map false dichotomies onto place we begin to define them in terms of gender differences so that culturally perceived inferiority of the two attributes is, in each case, assumed to be feminine and as such 'natural' and so excluded from theoretical investigation" (1990, in Hanson 1992).

In exploring the connection between public and private space we will call into question the 'natural order' and seek to understand how the current world is structured and the meaning of the current public/private divide. Hanson and Pratt argue that home and work became separated by geography as two separate points on a plan that began to diverge and that these separate spheres eventually began to be gendered spheres (1988, 300) that become interpreted as natural. "Place and context take on leading roles" and there are at least three ways this home-work and public vs. private debate affect our decision making processes

1) This connection will affect how, where, and in what we work.
2) The definitions of home and work have been redefined and need further refining.
3) Local context affects the home-work link.

Although a number of studies have begun to include measures of local context, we still have a long way to go in piecing together the ways in which variations in local context can affect the home-work link. Therefore, another item for the research agenda is to examine what aspects of context are most important to the home-work link and how.

Section 1.1.2 Feminist Empiricism

Feminist Empiricism, like all empiricist traditions, proposes that all experience can be logically laid out in neutral terms and provides the bulk of knowledge in the world. In 1963, Quine was the first to point out that this was not wholly correct and he argued that we must question the questions because even observation are theory-laden (Quine 1963, 61). Whereas Quine drew a sharp distinction between facts and values, feminist empiricists argue that

experience and value laden theory cannot be reduced to "normative psychological investigations, but rather upholds the roles of value judgments in rigorous empirical inquiry." Feminists also reject Quine's insistence on the individual as the basic level of inquiry. Many feminists wish to employ a more social constructionist model where the individual is located with a larger setting replete with values, judgments and assumptions. (Anderson 2009, section IV).

The major critique of Feminist Empiricism is that is falls into two paradoxical traps. The first is that while it criticizes the male perspective as having an inherent bias, it is asking that we introduce a bias in order to achieve more equity. While it is true that there is a paradox to the feminist solution of bias-to-rectify-bias, it does not inherently produce an inequitable position. Additional effort by women and for women is often required to overcome the natural inertia of the culture or system in order that women's views are heard and acted on. Similar to Sylviane Agasinski's argument that there is a difference between equality and equity (the later being about actually achieving the former) (1998, 144-146), once the original bias has been removed then it will no longer be necessary to impose a corrective bias. The second paradoxical criticism is that while feminists insist that it is society at large that holds views that oppress women, and that as individuals we can overcome those biases, feminist scholars do not want the locus of the theory to be the individual because it is society that forms and enforces the opinions (Anderson 2009, section IV). The difficulty in the analysis is identifying which comes first the individual or society.

The fourth area of emphasis is beginning to abate in recent years but still is a concern that must be addressed. Beginning in 1982 with Hanson and Monk, feminist geographers have been concerned with the increasing use of GIS technology in the field of geographic research for a number of reasons. Any feminist geography article needs to justify the use of GIS in the study.

One of the reasons for this concern was that the data used to produce the maps and correlations all too often hid women behind a masculine universal (McDowell 404, Agasiniski 61-63). Cindi Katz (2001) spoke out against the growing use of GIS and women's studies because it has been used for masculine ends. The call right now does not seem to be to get rid of it but to understand its place and use it appropriately. Mei-Po Kwan, further detailed the problems that feminist geography had with GIS into the following five areas of concern: epistemological issues with postmodernism, inadequate representations of space and subjectivity, instrumental rationality, technique and data driven methods, and its role in surveillance and military. Although Kwan recognized these concerns as valid, her option was that they could all be overcome though very careful research and extra attention given to the analysis itself so that the overarching concern that women did not disappear into the male universal was adequately addressed.

Kwan specifically addressed two areas where GIS and feminist studies converge. GIS is extremely useful from a visualization standpoint and "GIS can be a site for deconstructing the dualist understanding of geographical methods (as either quantitative or qualitative) and for enacting feminist visualization – the material practice of critical visual methods in feminist geography" (656). Because GIS analysis relies on quantitative data any scholar using GIS technology ought to be concerned over the reliability of the data being used in statistical studies. Many feminist scholars have relied on qualitative methods in order to tell woman's story better. GIS visualization can help bridge that divide. There are times when the statistics are either not reliable or cannot generate conclusive results. When mapping is used, it is sometimes possible to identify patterns that were not readily available through standard statistical methods. This is not to say GIS can only be used for visualization but that absent perfect data, GIS would be able to help at a minimum by assisting in visualization of that data. McDowell gives an even broader

approval of GIS. She only asks that we consider the methods employed and the questions we desire to answer to make sure that the methods match our intended outcome (656). Her main concern is that we should not place an overemphasis on using GIS simply because it is there.

Section 1.1.3 Standpoint Feminism

Standpoint Feminism was a theory initially introduced in 1983 by Nancy Hardstock and is defined as "developing the ground for a specifically feminist historical materialism" (quoted in *The Feminist Standpoint Theory Reader* by Sandra G Harding). Hardstock argues that because of the sexual based division of labor, women have acquired a point of view that is altogether different from men and gives them a unique perspective on how life can and should be organized (36). "So a feminist standpoint can allow us to understand patriarchal institutions and ideologies as perverse inversions of a more human social relation" (36). There are five aspects in particular that define standpoint feminism. First, material life structures life. Second, these structures create fundamentally opposed group differences. Third, the group that can control the formation of the power structures can use these structures to their advantage. Fourth, the minority group must struggle to communicate their needs against the vision the power group had assigned them. And fifth, upon adopting the minor position, the real relationships are exposed and those in the power who fight for the minority take on a liberationist role.

One of the major critiques to Standpoint Feminism is that is has assumed a single viewpoint from the women's experience. Postmodern feminism has been especially adamant that feminism recognize the plurality of female experiences. Building on French post-structuralists such as Jacques Derrida, Simone de Beauvoir, Michael Foucault, Levi-Strauss, Lacan, Kristeva, and others, Judith Butler wrote the book called *Gender Trouble*. One of the main points of her

book was to show that feminism was not concentrated into a "single gynocentric world" (x), and that gender differences "cannot be predictably mapped onto the travels of gender bending or changing" (xiv) and that we cannot deny "the internal complexity and indeterminacy of the terms and constitutions itself only through the exclusion of some art of the constituency that it simultaneously seeks to represent" (181). The main point here is that postmodernism feminism wishes to stretch the standpoint theories to recognize that there are multiple standpoints from which to speak.

Although much of the postmodern feminist literature, including Butler, focuses on language and the development of self from a psychology side, it does have much broader application than just language. From a geographical perspective, we are interested in finding the boundaries from where these voices originate. Geographers recognize that we speak from a particular place and with difference voices. So although much of the geographic literature does not focus on the language aspect of the postmodern movement, it does benefit from the perspective and can continue to add to the body of literature expressing these different points of view.

This leads us to the main arguments of feminist geography. First, feminist geographers insist that researchers concentrate their studies on the actual lived experience of women in time and space (Rose, Gillian (1993) *Feminism and Geography: The Limits of Geographical Knowledge*, University of Minnesota Press). As part of this lived experience we concentrate on breaking down false dichotomies and the allocating of the assumed feminine qualities to a lesser sphere. As stated earlier, Joy Parr argued that "Feminist scholars revealed the ways in which the mind/body, public/private, culture/nurture, reason/emotion, abstract/concrete dichotomies are mapped onto gender differences so that the inferior of the two attributes is, in each case, assumed

to be feminine, and as such 'natural' and so excluded from theoretical investigation" (1990, in Hanson 1992).

Position two is that we represent women in space and time and specifically find the boundary parameters of certain phenomena that affect women. (McDowell, 1993, Johnston, 1991, Nelson and Seager 2005). This is important for at least two reasons. First, in order to address problems we need know where exactly the problems exist. Second, once we understand where things are happening we can identify contributing and perpetuating factors. Without knowing the circumstances of an issue it is very difficult to understand the complexities that women face in attempting to undo the masculinist world around them.

Third is correcting masculinist perspectives of history that have written women out of the content, space and locations of history (Rose, 1993). Women have always been with us. They have lived from the beginning of time but to read the histories of the world one wonders if they did anything at all. Authors like Mona Domosh are particularly concerned not only with history but with a few other specific areas as well. She writes "[We] must always be aware that gender relations and representation are integral to the social construction of knowledge" (102). In our writing of history she warns that "We must be reflexive in our rewriting of the history of geography. Understanding the contemporary social constructions of the field, and how that construction is shaping our practices and the writing of our histories must be part of a feminist historiography of geography. We must question for example why the postmodern discourse in geography has been a male dominated discussion, and what our current commitment to GIS tells us about contemporary gender relations" (102). And her final admonition is that "a feminist historiography of geography would require an exploration of the relationship between its social practices and the gender stereotyping of society as a whole, and a reassessment both of the

particular historical reasons for the invisibility of women in the discipline, and the traditional belief that new scientific practices (such as codified field work) are necessary by-products of the search for knowledge" (102).

Fourth, feminist theories seek to speak from their own point of view and not have their cause co-opted into other theories like Marxism or anarchism. This has often caused some friction between feminists and the disciplines in which they write. Carole Pateman indicated that feminist theorists are just as likely to critique ideas such as Marxism that has often heralded itself as a boon to the women's movement (1986, 1-2). Does this mean that there is an intractable gap between feminism and geography in general? No. Susan Hanson found that geography and feminist theory could help each other (1992). There are several areas in particular that Hanson indicates geography would have a special connection with feminist studies and geography. Geography has a connection to the lived experience and based on this lived experience geographers are interested in situating women both in time and space and finding the boundaries of phenomenon that affect the lives of men and women (571). Feminist scholars understand the importance of context. There is no possibility to speak from the universal. Philosophers such as Sylviane Agaciniski have argued that the universal perspective always becomes the masculinist perspective (143). Likewise geographers also recognize that we cannot speak from a universal perspective - we always speak from somewhere (573). It is common ground between feminism and geography to focus on differences and look for patterns that can be found in space and time (574).

Section 1.1.4 Justification of the European Case Study

The fifth area of concern in feminist geography has been bringing gender analysis down from the wider worldview onto a more plausible scale. There is valid a criticism that the higher up the scale you climb, the more universal the data becomes and the more difficult it is to tease out the lived female experience. This has led some feminist geographers to retreat far from macro level analysis into a microspocic view of society focusing almost entirely on the woman herself and the space that her body occupies. Studies of this nature, while revealing in their exceptional detail on how women occupy and navigate space, are limited in their applicability because of concerns over the generalizability of the experience. While the caution can be appreciated, one does not have to resort to such extremes in order to meet the goals of feminist geography to contextualize the data, as well as provide generalizable trends that might better help understand and organize our world. Janet Townsend, in particular, has called on feminist geographers to focus on the regional level (1991). Townsend recognized that feminist geographers were concerned with the validity of results at the higher levels but felt that at the regional level, boundaries could be established and more general, reliable trends were possible without losing the voice of women to the masculine universal.

A regional level case study potentially provides the highest degree of analysis that can be reasonably done with statistics and still meet the applicability and contextualization standards that feminist geographers have called for. To do a study on breastfeeding at a regional level in order to determine if certain policies or factors will bear an association with higher long term breastfeeding rates, I needed to find a region that would fit a few criteria. First, there should be enough countries in the region to potentially allow a statistical analysis. Second, I want to compare and contrast certain factors like education, income, political systems, etc. In order to

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measure the effect policies had, I needed a region that, generally, was attempting to increase breastfeeding rates and also had populations with generally good access to the political, educational, or welfare systems. If there were no consistent policy in the region, and little access to these other control variables, it would be difficult to disentangle where breastfeeding policies were affecting the breastfeeding rate and where the other factors had an influence. Ideally there should also be variations in the implementation of breastfeeding policies. I also had to be able to access data on the topic.

Region	Countries	Population	Active Policies	Resource Access	Available Data
Africa	53	1 Billion	Some	Limited	Most
Americas	35	910 Million	Some	Some	Most
Asia	47	4 Billion	Some	Some	Most
Europe*	36	600 Million	Yes	Yes	Most
Table 1.1.4 Potential Regional Case Studies					

While Africa has the largest potential sample size (the unit of analysis is by country), breastfeeding policies are not regularly implemented in most of the African nations, nor does most of the population have access to available resources. The Americas would be the smallest sample size, and while the data would have been accessible, information on the policies and resources were not at the desired levels for a study of this nature. Asia, at 47 counties was a contender on the sample size however, like the Americas, access to information on resources and active implementation of breastfeeding policies is limited in many nations. Europe is also a smaller sample size, but the available of data, active political environment, and ready access to resources all combine to make Europe an ideal regional study population. While there are many definitions of which countries constitute Europe, I will use Eastern and Western Europe as

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defined by the old Cold War boundaries. The East-West demarcation will be one of the variables examined.

1.2 Current Debate – The History of Formula

Nestlé, while perhaps not the first to manufacture breast-milk substitutes, was certainly the first to mass-produce them. The story is told that in 1867 Henri Nestle became aware of a woman whose child would not eat. Nestle concocted his first infant formula and subsequently saved the life of that child (Nestle 2009, para 2). In the beginning, breast-milk supplements were only just that – supplements. Sometime in the 1930's, as part of the modernist movement, there was a wholesale adoption of science as a means to "improve" everything, including breast milk. Mothers were conditioned, by science, the media, physicians, and the government to turn to "scientific" assessments and inventions for their information on how to perform even simple household tasks (Ewen 2001, 169, 196-197). Breast-milk substitutes were promoted as both scientifically better – because they had macronutrients breast-milk did not contain (Pomerantz 2001, para 2), and as more feminist because breast-milk substitutes allowed a woman more freedom to enter the work place (Van Esterik, 2006, Section Backlash, para 1-2). The supremacy of the use of substitutes peaked between the late 1960's and the early 1980's when countries such as France and the UK saw breastfeeding rates drop to around 30% at birth and less than 5% at 12 months (WHO 2009).

By the mid 1980's and to the present day, attitudes towards breast-milk substitutes began to change after a series of scientific studies concluded that breastfeeding had enormous benefits to both the mother and child, as well as a positive impact on the environment and overall development of the nation (Morrow et all, 1988, Avery et all, 2009, Surgeon General 1985, Am J 1983, 2008 and 2009). Since the 1980's there has been a consistent, albeit mixed, message that

breastfeeding is the best option. Even formula companies acknowledge the superiority of breast milk and instead of pushing the nutrition, they push the convenience of their product (Gerber 2009, para 4).

1.3 Current Debate – The Cons.

There are some voices that opine it is either not necessary or is harmful to women to actively promote breastfeeding. The first complaint of the majority of scientists in the medical community revolves around the validity of the studies themselves. According to the critics, most early studies on the benefits of breastfeeding had numerous sampling errors. They note a number of reliability errors in the various studies that range from biased sample sizes and self-selected cohort to auto-correlation issues between variables like IQ and socioeconomic status of the parent and/or other confounding factors (Rosin 2009, Wolf 2009 and Kramer 2009). The critics' claim that when all of these factors are taken into consideration, the "Breast is Best" campaign should be adjusted to 'the breast is only marginally better'. The reasoning then follows that if breastfeeding is not THAT much better, why are we investing so much energy trying to get every woman to breastfeed? Hanna Rosin poses a valid question - why are women required to bear the burden of time and lost resources for minuscule benefits? And more importantly, if we are going to insist on asking this of our mothers, should not something be done to support them? This is in fact the most damning criticism that can be offered.

One of the purported benefits of breastfeeding is that it is free. Accurately measured, it is anything but free. In the first year of each baby's life 1/3 of breastfeeding mothers will miss 3 months of work and another 1/3 of breastfeeding mothers will miss 6 months of work (Galson 2008,1). This is just the beginning. For example, look at the situation of mothers who work

outside the home. A cultural expectation still remains that mothers will take more time off than fathers to take care of their children. Due to the expectation that women provide the majority of the child care, coupled with higher numbers of women working, women are far too often forced into more flexible, but lower paying jobs, or to chose career paths that put them out of line for promotions (GAO 2003, 62-66). While the initial longer periods of time off may not appear to add up to very much, combining that initial time with time off taken throughout her career for care taking and the culture's negative perception of that time off, results in women earning 20% less than men even when controlling other potential explanatory variables (among them job type, seniority, race, age, education and marital status) (GAO 2003, 23-25, 29). A similar report in Europe found very comparable results (Trinczek 2008). Obviously child care and breastfeeding is not really free. If society at large is going to push women to breastfeed, for the benefit of society, then society ought to bear an obligation to provide an environment that not only promotes breastfeeding but also protects the mothers who commit to doing it.

Any breastfeeding policy that does not take this into account is not addressing the complete problem. This issue in particular will be further addressed in section 3.4 on policy requirements of a successful breastfeeding program.

1.4 Current Debate – The Pros

While critics have indicated their mistrust of the benefits of breastfeeding when compared to the cost, the evidence appears to be overwhelmingly in favor of breastfeeding. In 2007 a Tufts University medical team did a review of over 400 individual studies on breastfeeding (Ip et all 2007). In this 400-page meta analysis they concluded that the following benefits to the child could conclusively be attributed to breastfeeding:

Reduced risk of:
          1) Acute otitis media (Middle Ear Infection)
          2) Non-specific gastroenteritis (stomach bugs non-flu)
          3) Severe lower respiratory tract infections
          4) Atopic dermatitis (Eczema skin disorders)
          5) Asthma (young children)
          6) Obesity
          7) Type 1 and 2 diabetes
          8) Childhood leukemia
          9) Sudden infant death syndrome (SIDS)
          10) Necrotizing enterocolitis (death of intestinal tissue)

The study, however, did not find a difference between breastfed babies and formula babies relating to cognitive performance. Nor did there appear to be a relationship between breastfeeding and a reduction in cardiovascular disease or a reduction in infant mortality in developed countries. These are important findings to understand. For instance, an argument that is often used to push women to breastfeed is that it will make your children smarter. The truth is that modern formulas appear to provide the ingredients necessary for proper cognitive development. The real problem enters when mothers read both findings and get confused over the truth. There are still 10 valid reasons for breastfeeding your baby - one does not have to engage in hyperbole in order to enforce its validity.

For mothers, the following benefits were attributable to breastfeeding:
          1) Reduced risk of type 2 diabetes
          2) Reduced risk of breast cancer
          3) Reduced risk of ovarian cancer

It was unclear from these studies if there was any relationship between breastfeeding and a reduction in osteoporosis, lower risk of postpartum depression, ease of weight loss, and a return to pre-pregnancy weight.

This meta-analysis by Tufts University clearly demonstrates that while the critics have some validity to their claim, the vast majority of the studies conclude that increasing the

prevalence and duration of breastfeeding is the best policy from a social and personal health perspective. While I will leave the debate on exactly how much better, and exactly in what ways, breast-milk is superior to formula according to those with an expertise in the field. Let me end with two recent findings/developments. First, Michael Kramer - who was a breastfeeding advocate/turned partial critic/turned advocate - has stated that while he still finds major problems with many of the previous studies he remains convinced, based on his own research and more recent studies that have emerged, that breastfeeding is still measurably better than breast-milk substitutes (Kramer and Lee May 5, 2008). In August 2009, a long term study of over 60,000 nurses, done by researchers from the University of North Carolina at Chapel Hill, found that there was a 59% lower risk of developing breast cancer in women who breastfeed and whose families had a history of breast cancer. For those with no family history there was no statistical reduction in risk. It was possible for a woman who chose to not breastfeed to take hormones to suppress milk production and achieve similar reductions in risk (42% reduction) (Reuters 2009, para 6). This is not quite as substantial as an overall reduction in breast cancer risk, but with 1 in 8 women facing a lifetime risk of developing breast cancer and almost 200,000 a year being diagnosed with breast cancer, this is still a substantial benefit (Cancer.org 2009).

While these recent findings may not be as dramatic as some of the hype (what mother does not want her child to be a genius - or lose all her "baby fat"?), breastfeeding is still better in substantial ways than formula feeding. My conclusion, then, is breastfeeding policies are extremely important to the overall health of the mother, baby and consequently the nation. However, having children and society receive the bulk of the benefits while expecting mothers to bear all of the cost is not an equitable distribution.

My thesis thus seeks to address the research question from several angles. I will be adding to our knowledge on how the public and private converge and what actions must be taken in order to facilitate the dual roles of women. While I will not add directly to Standpoint Feminism theory, I will explicitly address their concerns in this study in order to produce a work that will attempt to provide solutions to the public-private divide from a woman's point of view. I acknowledge that I am not an expert in this convergence. As a man I've never had to breastfeed in public. Perhaps this is why the warning and concerns addressed in Standpoint Feminism are especially useful to me. It provides a framework that I can utilize to help produce insights that I might not naturally see on my own.

Because feminist empiricists are concerned with the marginalization of women's perspective when data is aggregated at higher and higher levels of analysis, I have chosen a regional case study that should provide a large enough sample to allow us to draw some generalizable conclusions that do not marginalize the female perspective but, hopefully, will bring it into more sharp relief. In this I hope to follow the example of other feminist empiricists like S. R. Bowlby, J. Foord, and S. Mackenzie who have successfully navigated these concerns and contributed to their field of study.

1.5 Breastfeeding Factors and Principles.

In this section I will outline factors that may contribute to higher or lower breastfeeding rates. First I will address the context of breastfeeding in relationship to public and private spheres. In each subsection, I will outline factors that complicate breastfeeding practices, and at the end of each subsection I will propose a potential principle that, if adopted, may contribute to increases in breastfeeding rates.

1.5.1 Context of Public vs Private

For most women, the child-bearing years occur at the same general time as peak educational and career opportunities. The traditional solution to this is simply to ignore it and ask women to bear the full responsibility of the choice. There are well-documented benefits for women and families when a woman has a higher education and economic independence. She enjoys significantly more equality in her relationships (Amato and Booth 1995, 59), feels more security, happiness, and has more confidence (BBC 2007, Bennetts 2007), and the risk of divorce is also lower (Parker-Pope 2010, para 8). The conundrum between the two positions begins with our understanding that there are discernible and substantial benefits to breastfeeding for the first 1-2 years (American Pediatric Association, the World Health Organization, UNICEF). How are women to find a complementary fit for this dual experience? Like most dichotomies the answer cannot be found or expressed by focusing only on one side. Currently in the Europe, approximately 65% of women work each day (World Development Indicators Database 2005). So while society has long expected women to perform their 'natural' duty in bearing and breastfeeding children, this longstanding biological imperative and social ascription has now been met with modern realities. If we want our children to be healthy, if we want our women to be healthy and our marriages secure, we must find ways to reconcile all of these positions so that the best outcome, that of a strong and secure breastfeeding woman, becomes possible.

One challenge that complicates our ability to promote breastfeeding is a conceptual model that prefers to identify women either in the role of mother or the role of worker ("worker" being defined by masculine concepts), but not both. This false dichotomy can be observed in the perception that women need to "return" to being solely in the home. The first step here may be to recognize that our current understanding of the "stay-at-home mom" is a modern cultural

phenomenon and figment of our collective imagination. This is not how mothers have raised children and participated in life throughout human history with the exception of the last 100 years. Consider the following example from the United States. While 73% of women working may appear high when compared with the labor force statistics from societal norms in the more recent past, it should be noted that this higher percentage is in many ways a return to the standard norm before the Industrial Revolution. While it is not possible to know for sure how all work was valued before the onset of wage labor, there were studies done by the US Census Bureau that show some interesting trends. Between 1870 and 1920 women's participation in the formal work force increased from 35% to 45%, and even though a portion of the work was not remunerated, the US Census Bureau indicated that 89.9% of men and 89.7% of women were engaged in productive labor, with women's labor split somewhat equally between formal and informal work (Hill, 1929).

According to Hill's report, it was apparent that the US Census Bureau could not understand the trend or foresee its continuation into the modern day. While the bureau could recognize that "the interest in women's occupations lies not so much in the number occupied or in the amount of work that they are doing as in the change that is taking place in the character of their occupations and the extent to which their work takes them away from the home, which was once the sole field of occupational activity for most women" they also failed to see this as a continuing trend and an equalization of the labor force (Hill 1929, 4).

> "If there were such a tendency, and if it continued until in some distant future the
> parallelism became complete, the percentage of women would then, of course, be
> the same in all occupational groups. It would not be as great among manual

laborers as among clerks. No one, it may be presumed, anticipates any such consummation as that or desired it. It is safe to say that in economic as well as in other relationships of life, there will always be a functional distinction based on sex" (Hill 1929, 50).

This failed recognition, and the insistence that women return to the 'natural' place in home, has in my opinion been one of the major contributing sources of resistance to changing the labor force so that women (and men as well) could more easily contribute to their families, society, and their national well being as they did in the past. It would seem that the first step in creating a better workplace to support women in their dual roles as women and mothers is this simple recognition that they do indeed have a role in both locations.

Another general feeling is that if women were to enter the formal work place, families would be hurt in the process. The argument stemming from this position is that if breastfeeding is best for the children we should not make the work place any easier but should insist that women return home to their "proper' place. Before insisting on policies that help promote breastfeeding while at the same time support women's participation in the work force, we must ask ourselves if there are compelling reasons why a state should privilege policies that allow women to combine work and family. Research indicates the answer to this is yes.

If one of our societal goals is to create and maintain strong families then we must recognize that there are significant reasons, based on equality between the sexes and parity in married life, suggesting that successful marriages are determined by both genders' active participation in formal remunerated work and both genders' active participation in the home.

Elizabeth Gilbert, in a recent interview about her new book *Committed: A Skeptic Makes Peace With Marriage*, concludes that:

> "The curious thing is that women who report themselves consistently as being happiest in their marriage are women who are the most obvious beneficiaries of feminism... The reality is that those women are much, much more content in their marriage... Once you think about it, the more freedom that people have as human beings, the more contented they are."

Something to consider as we discuss the benefits that societies, marriages, women and children receive when women are able to fully participate and engage in the public sphere is that this can have a positive effect for men as well. Greater numbers of women demanding work schedules that support the needs of the family also allow men to demand and receive the same benefits. Flexible time schedules and other pro-family policies allow both men and women more time to spend with their families while providing for their families.

While breastfeeding support has gained momentum, several feminist scholars and advocacy groups continue to issue statements of caution in opposition to the breastfeeding recommendations from an equality standpoint (Galtry 2000, Rosin 2009, Law 2000, White 2002, Van Esterik 1994, Blum 1993). These words of caution are different than the calls from some historical feminist theorists and scholars to abandon all things linking women to motherhood in order to escape the trap of non-productivity and to realize a "singular affirmation of themselves" (Simone de Beauvoir in Agacinski 2001, 69). These new voices of caution ask that we at least consider where our oppositional ideals have come from so we can understand them better (Van

Esterik 2002, 265). As we consider the origin of our positions we may find that the two intractable goods we have created are only social constructs and not biological determinants diametrically opposed to each other. If the former is the case then we can ask ourselves what could be done to change the constructs and manipulate our environment so that we can have both benefits (Galtry 2000, 296, Wall 2001, 604-605, Hays 1996).

These are the overarching conditions under which breastfeeding choices are made. I will now consider several principles that might mitigate these risks and contribute to higher breastfeeding rates.

1.5.2 Social Acceptance of Public Breastfeeding

This is extremely important to the development of a feminist perspective of public and private space. As long as the woman is behaving like a man she is typically allowed any space she chooses. Mothers however potentially create private space out of any public sphere they occupy be nature of how they chose to use the space. If a mother chooses only to shop then public space remain simply public. But if her baby is need of food there is a breach in the de facto nature of that space. The mother who chooses to breastfeed calls into question the use of the space and her action require a response to the changing definition of the space.

Yi-Fu Tuan argued that in order for space to exist movement is required. I certainly do not aim to challenge that, I would however like to add a corollary. Space is created by movement, but the movement may be in the definition of the location itself, not just a directional transition into or away from the location. When the definition of the location is changed because of actions that someone has taken, or because of an other's interpretation of the use of that location becomes altered, we have then created space wherein action begins to unfold.

Breastfeeding then creates a quandary over public vs. private space. Unless women are to be excluded from the public sphere while they are breastfeeding, society must begin to recognize its place in public. Even without considering women in the work force, women are always in the public sphere. They work, serve, shop, recreate, lobby, etc., all in public space. This work cannot halt just because a woman has had a baby and must now feed it. As a society we need all of a mother's contributions, during the whole of her life time and the whole of her life experience. However, her ability to fully engage in life is limited by society's acceptance of her breastfeeding in public.

In order for women to successfully breastfeed for the recommended one to two years it is necessary to adjust our perceptions of space. Social acceptance of public breastfeeding is required so that women, without having to plan around feeding schedules, arrange baby sitters, or resort to formula, can participate fully in public and bring her infant with her. Any limitation on her ability to feed publicly will act as a deterrent to breastfeeding and may have a long-term impact on the number of months a mother is willing to breastfeed. We would expect that countries whose social acceptance score is high would also have higher breastfeeding rates, because one of the major deterrents had been removed.

Each variable needs to assess a different aspect of the breastfeeding equation. It has been noted by my thesis committee that one might reasonably expect social acceptance of public breastfeeding to be extremely influenced by the four other factors listed below. Each independent variable was tested for colinearity to ensure they were appropriate to use in the statistical models. Each variable was independent of the others. A question can then arise as to why the next four independent variables do not correlate to higher social acceptance. There is at least one explanation. I believe the variation is captured in the difference between law and practice. The

resource commitment, the legal protections and the control of formula products are all legal controls. The social acceptance of breastfeeding is how well society at large, in practice, treats women who breast feed in public, and the united voice variable below measures how well the official bodies conform to a pro breastfeeding advocacy program. Until there are perfect laws, and perfect enforcement of those laws, and until a sufficient passage of time has helped to normalize the practice across the population there is likely to always be a fair amount of variance between practice and legal variables.

The standard rule of thumb is that if the VIF (variance inflation factor) statistic is below a 10 then the data set meets the multicollinearity assumption. As you can see in Table 1.5.2, each of the VIF statistics are well below 10. The R-Tolerance statistic also measures the degree of multicollinearity but the scale is from -1 to 1. The closer to 0 the statistic approaches, the higher the multicollinearity. By every measure, the data in this dataset meet the assumption of lack of multicollinearity.

Variable	Sqrt VIF	VIF	R-Tolerance	Squared
Social Acceptance	1.62	1.27	0.6188	0.3812
Resources	1.15	1.07	0.8693	0.1307
Laws	1.29	1.13	0.7768	0.2232
United Voice	1.32	1.15	0.7597	0.2403
Media	1.11	1.05	0.9019	0.0981
1.5.2 Collinearity Diagnostics for the Five Contextual Factors				

1.5.3 Resources Commitment and Legal Structure

The stark reality is that women who bear children are asked to take an enormous financial and personal risk, disproportionally higher than what men, as fathers, are expected to make. Tied

to this risk are the short term and long term benefits that individuals and society receive, in a sense, as a favor from women. As an individual benefit, husbands of women who stay home to care for the baby and assume most of the household responsibilities, are actually more competitive in the workplace. Salary studies show that men with stay-at-home wives make more money than those without.   Also, in a financial bind, the woman can go to work and supplement the man's income. Women often do not have this kind of financial support. They are also exposed to enormous economic, emotional, and even physical risk because of the relative positions of power within the family (Crittenden 2001, 201, 242-244). A prevailing point of view is that mothers receive benefit from the husband because they are being taken care of while married and do not need additional support. While this may be true in some upper-middle-class-white-never-divorced rarity, it is certainly not the reality that the vast majority of women are required to navigate. With no certainty that any particular woman is going to be the lucky "taken care of" one, this translates into an enormous risk for the women while the men reap a reward regardless of the marriage outcome.

While all nations will openly and actively advocate for the equality of women, not as many actually implement policies that make the choice reasonable. The debate centers on the mother's 'choice' (Crittenden 2001). As the argument goes, if mother A chooses to breastfeed her child, then she is solely liable for any cost associated with the decision. This is usually followed up by some comparison of 'If I chose to be a teacher instead of a doctor I do not expect someone to pay me more for my choice'. The logic then follows with 'If I asked someone to pay me for my choices that would be unfair to the person who invested more time and energy into being a doctor. It would be unfair'. This erroneous justification seeks to make all choices equivalent without consideration of the cost or consequence. I will address the fallacy of the argument first

and then address the fairness portion of the argument. On choice equivalency, the choice to be a mother is more on the order of a cultural expectation and demand, not a haphazard decision about what you want to do with your life. If everyone who wanted to be a doctor decided to do something else, there would certainly be an increase in health problems and premature death; however, life would go on. If women collectively decided to choose to not have babies anymore, the cataclysmic end of our society would be upon us. And unlike normal economic choice models - where if there is a high demand for a particular good, the price will go up and will induce other to enter the market - nothing like that exists for mothers. The argument against helping mothers to have and care for babies does not hold up to logic. The choice to have a baby is not simply an economic one but the economics of the choice bring foreseeable consequences that must be evaluated by every woman. Not surprisingly we see lower birth rates, and would expect to see lower breastfeeding rates as well, in a context of no interventions.

This brings us to the fairness part of the argument. Again there is a logical fallacy. The assumption implicit in the argument is that the only economic good received by the man are the wages he earns by trading his time for money as an employee. This simplistic outlook conforms with western notions of individualism, however it does not account for all of the benefits received. First, men, and I'm generalizing here, tend to see the market as just existing a priori to their arrival in it, or they believe that some other man/business created it. But markets are created by people and people are created by mothers. We are all the beneficiaries of a system that was not created by us, to which we owe the very opportunity of work. Second, businesses, and the people who run them, benefit every day from the role of mothers. Babies who are breastfed are healthier as children, which benefits the mother, the employer, and society, as less time is require to take off work due to illness. These same babies are also healthier throughout their whole lives,

thus society, business, and government continue to reap the reward of mothers who breastfeed (see section 1.4 for analysis of breastfeeding benefits). The fairness argument thus ignores the fact that when a woman is breastfeeding and performing caring labor, she is indeed contributing to the society at large: what is fair is that this contribution be not only recognized but supported. Sylviane Agacinski refers to this as equity vs equality (2001, 144-146). While providing mothers extra resources such as additional breaks, paid maternity leave, and laws protecting them in public and private spheres may appear inequitable when compared to the straightforward pay-for-work received by men in the workspace, it is the equitable thing to do when all of the prices and contributions are considered in their entirety.

Thus, if we recognize that bearing children and breastfeeding them is not solely the mother's choice, but that we all bear responsibility for it and receive benefit from it, then we have to take into consideration the impact of that choice on the women themselves. Ann Crittenden refers to this cost as the "Mommy Tax". Based on a income of $50,000, she estimates that between the lost wages while preparing to give birth, giving birth, postpartum, breastfeeding, additional time off to care for the children - which all lead to losses of work hours, lost opportunities, lost promotions, and lost future wages from Social Security or pensions (because of the lower earned income)- add up to a cost of over $1,000,000 for the mother in her lifetime earning potential – for just one child (2001, 88)!

Ensuring this equity requires two types of laws. First, passing laws that protect women in the public sphere are crucial, allowing women to feel more accepted breastfeeding in public and protected from public censure or ridicule. There are at least two aspects to the public sphere: one is the work environment and the other is the general public. Without laws governing the right to breastfeed in an employment environment we will continue to see court cases similar to what

happened in Ohio where LaNisa Allen was fired from her job because of her desire to breastfeed (Harding 2009). Women in public for whatever reason must be protected in their right to breastfeed. The weight of the law should be in favor of the most vulnerable in society. A mother should know that the government supports her and will be there to protect her right to chose the best way to provide for her baby. This also plays into social acceptance of public breastfeeding. Second, laws that commit public resources to support the welfare of mother and child must be in effect. These resources are not handouts. As discussed, payments for maternity leave and breastfeeding are only a small recompense for the actual cost of having and raising a child.

Resources such as paid maternity leave for a year, paid breastfeeding work breaks, accruing retirement contributions and insurance for stay-at-home mothers, child credits, and early childhood education programs would all serve to reduce the liability that women accept when they choose to have a child. Such supporting resources would be a strong recognition that mothers are valued for the contribution made in individual families as well as the society at large and a country with these supporting resources could be expected to experience higher breastfeeding rates.

1.5.4 United Voice

There is a saying in advertising that 'a confused mind does nothing'. More specifically, a confused mind does what is most natural. In the realm of breastfeeding there are a significant numbers of voices that contribute to the confusion of information that bombard women regarding the best breastfeeding practices. Governments, health care professionals, service providers, news organizations, business, even the culture at large all have a voice and a stake in the breastfeeding debate. The more united the message, the less confusion a consumer of information will

experience. In my analysis, this factor specifically measures the degree of unity in practice and not as prescribed by the law. While the legal voice assessed in section 1.5.3 may represent a government's legal position on breastfeeding it does not capture what is actually being practiced nor is the government the only entity that provides breastfeeding advice. All stakeholders should be united in their promotion of breastfeeding. It could be expected that countries where there is a more united voice consistently promoting and supporting breastfeeding would experience higher rates of breastfeeding.

1.5.5 Media

While business contribution to the media message is captured in part by the United Voice variable in section 3.4.5, business also competes in spheres other than verbal rhetoric. Where businesses are legally permitted to advertise, or "inform" the mothers, the concepts they are able to express in these spaces are the essence of the Media variable. Over the last decade many countries have noticed the profound effect formula advertisements have on breastfeeding rates. Formula companies no longer claim their product is better than breast milk. Now they promote their product as supplemental to the early stages of breastfeeding, inducing the mother to believe that during the time period she only produces colostrum she also needs baby formula. This is a means to get the child 'addicted' to the bottle. Once a baby starts eating from a bottle, versus a breast, she/he will begin to forget how to breastfeed properly and can even learn to reject the breast because it requires more effort. Subversive marketing policies such these must be banned by law and removed from practice. In 1981 the World Health Organization published official policies regarding the advertisement of formula, recommending that it should be banned in hospitals and severely limited in other public media. In the last three decades their position has

not changed. As recently as 2002 both the WHO and the WHA (World Health Assembly) reaffirmed their commitments regarding severe restrictions on formula companies. Their recommendations include how formula is to be advertised outside of hospitals, the type of words that can be used and even the images that may be displayed. More than a decade passed from the original WHO recommendation before some countries would take this recommendation seriously. Norway was really the first to adopt this protocol and essentially ban formula from their hospitals. Norway's breastfeeding rates are now over 98% at birth (Alverez 2003, A3), and other countries are beginning to take notice. As an encouraging sign, two of the countries with the lowest breastfeeding rates in Europe, Ireland and the UK, have taken preliminary steps towards a policy that will effectively limit the advertising power of the formula companies in hospitals and the media (Mullen 2009 and Baby Milk Action 2007).

1.5.6 Income Inequality

In order for there to be demonstrable progress for both the women and the children we must define a successful breastfeeding program as one that not only substantially increases the breastfeeding rate and duration, but manages to do so while at the same time putting safeguards in place that protect women against economic vulnerability so they do not become even more disadvantaged while making the sacrifice and taking the responsibility to breastfeed. The principles outlined above should improve the breastfeeding rates, but there is a possibility that they may also help decrease income inequality. By making breastfeeding less taboo, less financially risky, and making it legally challenging to dismiss lactating women, there should at least be a stabilization of income disparity if not an actual improvement.

1.5.7 Summary

In summary of section 1.5, the following factors need to be present in an effective breastfeeding policy program. First, there must be a high degree of social acceptance and support for breastfeeding. How this is achieved is beyond the scope of this thesis, but public opinion on public breastfeeding may influenced from a myriad of different sources including public service messages, to spousal support, to the perception that everybody is or is not doing it. This thesis is limited to measuring the outcome of public social acceptance of breastfeeding, but not how that acceptance is achieved per se. Second, sufficient resources must be committed to the mother and child so as support them during the first year of life – making it more feasible to breastfeed the child for longer periods of time. Third, laws must be present to protect the woman in the public and business arenas. Fourth, there must be a united voice and message about breastfeeding at the political, medical, corporate and personal levels. Fifth, formula companies should be severely restricted from how, when and where they may advertise. And finally, income disparity between men and women should remain the same or diminish as breastfeeding rates rise. In the following section I will propose testable hypotheses and consider any additional factors that might account for higher or lower breastfeeding rates.

1.6 Models, Opperationalization, Scales, and Hypotheses.

The various studies and interviews cited in the previous discussion have indicated that at least five factors listed above are required for a strong breastfeeding program that will increase the breastfeeding rates at birth, 6 months, and 12 months after birth. The question remains, however, to demonstrate which, if any, of those factors produce the aggregate effects projected

in the theoretical research, and to explore any alternative explanations that may account for an association between higher and lower rates.

Of the three periods, the 6 month breastfeeding rate is the most critical. While any breastfeeding is better than nothing, the majority of the benefits normally associated with breastfeeding are strongest when breastfeeding is performed for a minimum of six months (Breastfeeding Basics 2009, para 16). Ideally you want the mother and baby to sustain breastfeeding as long as possible, the longer the better, but at the very least that minimum of 6 months. Thus, while higher rates at the beginning are important, it is the 6 and 12 month rates that are most critical for the model to explain.

While any model could potentially be associated with higher breastfeeding rates, that is not the only association I am concerned with. As stated previously, if the breastfeeding model is to be associated with higher breastfeeding rates we would not consider it a successful policy if it did not also positively impact income equality. Each of these preceding factors may increase breastfeeding rates but they may unintentionally contribute to more economic risk for women. For example, while there may be a high social acceptance of breastfeeding, that acceptance might be limited to public spaces and not private businesses. If there is a low public perception of breastfeeding at work, even if it is legal, this might contribute to a perception that women are less valuable workers and therefore they may be paid less. While I am not trying to assert that breastfeeding policies, practices or attitudes are the sole cause of income disparity, I do want to account for any associated policies or factors. Any policy that accomplishes one at the expense of the other would not fulfill the requirements set forth at the beginning of the paper on what constituted a successful breastfeeding policy.

In order to assess the association between the these four independent variables there are 5 models that will be tested and several hypotheses that will be examined. Section 1.6 will cover how each model is set up, and which hypotheses will be tested for each model.

1.6.1 Model 1 - The Five Contextual Variables

Model 1 examines the five factors listed in sections 1.5.2 through 1.5.5 which will be analyzed as individual independent variables to assess if they are associated with higher breastfeeding rates. This first model represents actions that a society can take to create a breastfeeding policy that will increase the short term and long term breastfeeding rates. Each of the five contextual factors (social acceptance, resource commitment, legal protection, a united voice and advertisement control) will be used as independent variables. My hypothesis is that these five contextual variables will not be correlated to any of the three breastfeeding periods. The first four null hypotheses are:

H1: For the initial breastfeeding rate period there will be NO statistically significatn association between the breastfeeding rates and each of the five contextual variables.

H2: For the six month breastfeeding rate period there will be NO statistically significant association between the breastfeeding rate and each of the five contextual variables.

H3: For the twelve month breastfeeding rate period there will be NO statistically significant association between the breastfeeding rate and each of the five contextual variables.

H4: These breastfeeding contextual factors, individually, will NOT negatively impact women's vulnerability in the market as assessed by income disparity.

1.6.2 Model 2 - Average of the Five Contextual Variables

The assumption of previous research on what improves breastfeeding rates has been that each policy in itself is intrinsically beneficial to increased breastfeeding rates. It is my contention that only a combined effort across all five factors will be necessary in order to see an association

between policies and practices and changes in cultural behavior. Model 2 will assess this

association over each of the three time periods and income disparity.

> H5: For the initial breastfeeding rate period, the average of the five contextual scores will exhibit strong, significant correlations between it and the initial breastfeeding rate.

> H6: For the six month breastfeeding rate period, the average of the five contextual scores will exhibit strong, significant correlations between it and the six month breastfeeding rate.

> H7: For the twelve month breastfeeding rate period, the average of the five contextual scores will exhibit strong, significant correlations between it and the twelve month breastfeeding rate.

> H8: The average of these breastfeeding contextual factors will NOT adversely impact women's vulnerability in the market as assessed by income disparity.

1.6.2 Model 3 - Alternative Set of Explanatory Variables #1

What is the role of wealth, politics, and education, and how do they affect breastfeeding

rates? It is reasonable to conclude that those nations with higher personal incomes and/or higher

tax revenue per capita would have the resources (individually or by the state) to dedicate to the

societal benefit of increased breastfeeding by subsidizing women's incomes or time in order to

facilitate the time, energy and resources necessary to breastfeed. Conversely it is also reasonable

to assume that the poorer nations would be more likely to breastfeed because they do not have

the resources to dedicate to alternative food choices.

The number of women serving in elected government positions could potentially have an

impact on the number of women breastfeeding. There are at least three avenues in which they

could influence the breastfeeding rates. First, women may be more likely to speak openly about

breastfeeding and articulate, in a public forum, an official position that promotes higher

breastfeeding rates. Second, they may be more disposed to proposing and/or being involved in

passing legislation that would promote breastfeeding. Finally, their presence in higher offices

may help change the opinion that women, and especially those who have children, are less

capable than their male counterparts. If there were a strong significant correlation between women in politics and the other independent variables, such as the law or resource variable, I would need to remove it from the analysis. This however is not the case: the percentage of women in the national legislature is not significantly correlated with either the law or the resource variable.

This is an interesting finding in and of itself. One would suspect that increasing numbers of women in legislature would be associated with greater promotion of these policies, but that does not appear to be the case. There may be several reasons for this, including the following three. First, women may feel reluctant in a generally male establishment to push a feminist agenda because they would be seen as competing more than they already are with the male establishment. Second, this competition may open up the female incumbents to attack from male challengers. In our period of time where breastfeeding is still in a transition period of public acceptance, any legislation that is passed that appears to favor women over men could be used by an opponent to undermine her position in office. Third, female legislators may be more likely to have concerns with breastfeeding along with several other feminist voices with similar concerns about breastfeeding policies and they may be actively choosing to downplay these types of policies because of ideological reasons. There may be other reasons, but whatever the reason it is obvious that there is not a direct correlation. However it is not clear if women in a legislature would become important when combined with other variables such as high public acceptance of breastfeeding due to a suppressor effect - meaning that women in the legislature may only be statistically significant when regressed in combination with other variables.

Average levels of female education is another possible factor - women who are more educated may experience competing pressures. A woman with a degree may feel more pressure

to use this education in the workspace and perhaps feel greater pressure to push for alternative sources of feeding her child. Alternately, a more educated a women is more likely to have access to additional resources that would allow her to successfully breastfeed her child for greater lengths of time. She is also more likely to know the benefits of breastfeeding and feel the social and medical pressure to provide those benefits to her child.

There are other minor factors that may also correlate to higher or lower rates. While Europe is more integrated now through a legal and monetary system, there are some residual differences due to political and religious influences. A few Eastern European states are still recovering from the effects of the Cold War, and the revival of not only their economy but also their culture. Thus we may see a significant difference in results depending on whether we examine Western or Eastern European countries.

While each of these variables may be reasonable alternatives to explaining higher or lower rates of breastfeeding in Europe, it is my observation that there is a mix of higher and lower rates of breastfeeding in each of these independent variables. I therefore posit that there will be no statistical correlation between the Model 3 variables and any of the breastfeeding periods.

Model 3 will therefore test the following hypothesis over the four independent dependent variables.

H9.   For the initial breastfeeding rate period, each of the Model 3 independent variables will NOT be significantly associated with higher breastfeeding rates.

H10.   For the 6 month breastfeeding rate period, each of the Model 3 independent variables will NOT besignificantly associated with higher breastfeeding rates.

H11.   For the 12 month breastfeeding rate period, each of the Model 3 independent variables will NOT be significantly associated with higher breastfeeding rates.

1.6.3 Model 4 - Alternative Averages

It is also plausible that it may not be any one of these factors in Model 3 individually, but their combined effect that might result in higher breastfeeding rates. Similar to the five contextual variables, I have also averaged all of the Model 3 variables together as well and will assess if there is a combined effect even if each individual variable does not have a profound impact.

H12.   For the initial breastfeeding rate period, the average of the Model 3 independent variables will NOT be significantly associated with higher breastfeeding rates.

H13.   For the 6 month breastfeeding rate period, the average of the Model 3 independent variables will NOT be significantly associated with higher breastfeeding rates.

H14.   For the 12 month breastfeeding rate period, the average of the Model 3 independent variables will NOT be significantly associated with higher breastfeeding rates.

1.6.4 Model 5 - Alternative Set of Explanatory Variables #2

In addition to policies, economics, education, and politics, there is the possibility that religious differences may also have an impact. Nations where there is one predominant religion, or where religion is more widely practiced, might present a stronger or weaker association with breastfeeding rates. Religions such as the Roman Catholic Church and Islam encourage breastfeeding. The differences between predominantly mono-religious nations and other nations may be worth exploring. Two variables were be tested here. The majority pressence in the population of Catholocism/Orthodox/Islam, and the number of regular church attendees in the country.

H15.   For the initial breastfeeding rate period, the Model 5 independent variables will NOT be significantly associated with higher breastfeeding rates.

H16.   For the 6 month breastfeeding rate period, the Model 5 independent variables will NOT be significantly associated with higher breastfeeding rates.

H17.   For the 12 month breastfeeding rate period, the Model 5 independent variables will NOT be associated with higher breastfeeding rates

1.6.5 Explanation of Scales and Data

Model 1 will be tested using 5 scales that I created using data from the WomanStats database. How each scale was created is detailed below beginning in section 1.6.8 . Model 2 will use direct or proxy variables to assess each of the items in the hypotheses. Where the data for Model 2 was collected from and accessed is also outlined below beginning in section 1.6.15. Attempting to collect a cross-national dataset was a challenge. No one source of information collected data for all of the countries on any particular variable, not all sources used comparable data collection methods, and in a few instances only ordinal data was available. For example, one source might only declare that 'breastfeeding at 12 months was extremely low'. Many countries in Europe did collect more specific numbers but each country had a different method of collecting the data, reporting it for various time frames, and even used different definitions. Breastfeeding initiation in one country could mean exclusively breastfeeding at birth, where in another it could mean the mother had at least attempted to breastfeed. In order to create reliable units of measure that could be used on a cross-national basis I had to reduce the quality of some of the data to the lowest common denominator that still represented as accurately as possible the actual range of the data.

There are four types of data represented in the scales; data representing a single numeric value, a dummy variable, an average based on the five scale point, and data from multiple sources requiring imputation of a ranked score based upon the evidence. Six of the scales - Politics Rank, Income Per Capita, Welfare Expenditures, Religious Dominance, Religious

Attendance, and College Education - were simplified into a 5 point scale in the following manner. Typically the range of the data for each of these variables was not greater than 50%. If the top level of college enrollment was 56/1000 and the lowest was 1/1000 this created a natural ordinal range of Level 1: 50-59, Level 2: 40-49, Level 3: 30-39, Level 2: 20-29, and Level 1: 10-19, with only 2 outliers in the 0-9 range. As I will outline below, in each instance I had to either group the outliers in with the bottom level or potentially create a 6th level. Generally five natural categories were created; if more than 5 were created then I combined the two lowest values into one. The East-West scale is the only dummy variable and simply indicates if a country was part of the former Soviet Bloc or not.

1.6.6 Dependent Variables Breastfeeding and Income Disparity

There are three standard measures of breastfeeding rates; birth (0 month), 6 months and 12 months. While there are various definitions on what breastfeeding at birth means I chose to base my interpretation on exclusive breastfeeding at birth. Data collected from the various countries generally noted if the data at birth was exclusive. Some data sources would report breastfeeding attempts as well as exclusive breastfeeding. Some would not mention what the definition was, they would just present the data. In these instances I would assume that the number was based on attempts and would weight other available data heavier in the assessment for the scale. This potentially biased the sample down; however based on the data sources I observed it appeared that when it was not specifically demarcated as exclusive breastfeeding, the intended meaning was a more liberal definition. I believe my assessment rule to reflect the intent of the data.

The six month rate was commonly reported in two different ways, either as exclusive or supplemental. The WHO and other organizations recommend that babies be exclusively breastfeed for 6 months. This is obviously the gold standard. However, fewer than half of the countries kept accurate data on six month exclusive breastfeeding rates. It was much more common to have numbers reported as any breastfeeding at 6 months. I made the judgment call based on the available data to record for purposes of the scale data based on breastfeeding at six months and complementary foods. Countries that reported data on exclusive breastfeeding rates also would commonly report supplemental rates as well. I felt more comfortable making a few judgment calls on the level of supplemental breastfeeding based on the recorded exclusive rates of breastfeeding than attempting to estimate exclusive breastfeeding levels based on supplemental rates.

Breastfeeding Initiation Rates

Rank

1 <75%
2 75-84%
3 85-89%
4 90-94%
5 95-100%

Map 1.6.6

0   485 970   1,940 Miles

Breastfeeding 6 Month Rates

Month Rate

- 1 < 30%
- 2 30-39%
- 3 40-49%
- 4 50-59%
- 5 > 59%

0 485 970 1,940 Miles

Map 1.6.6.1
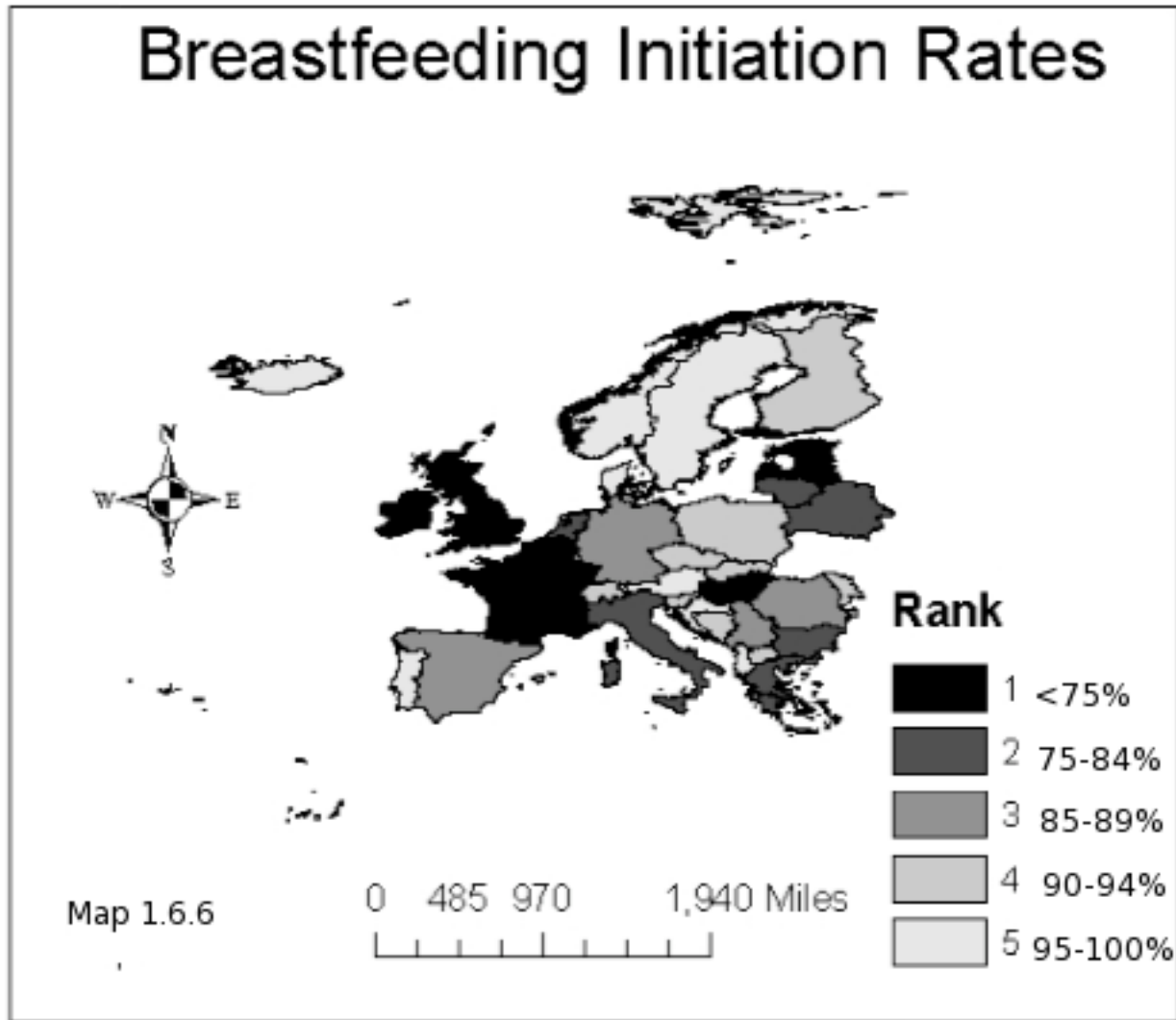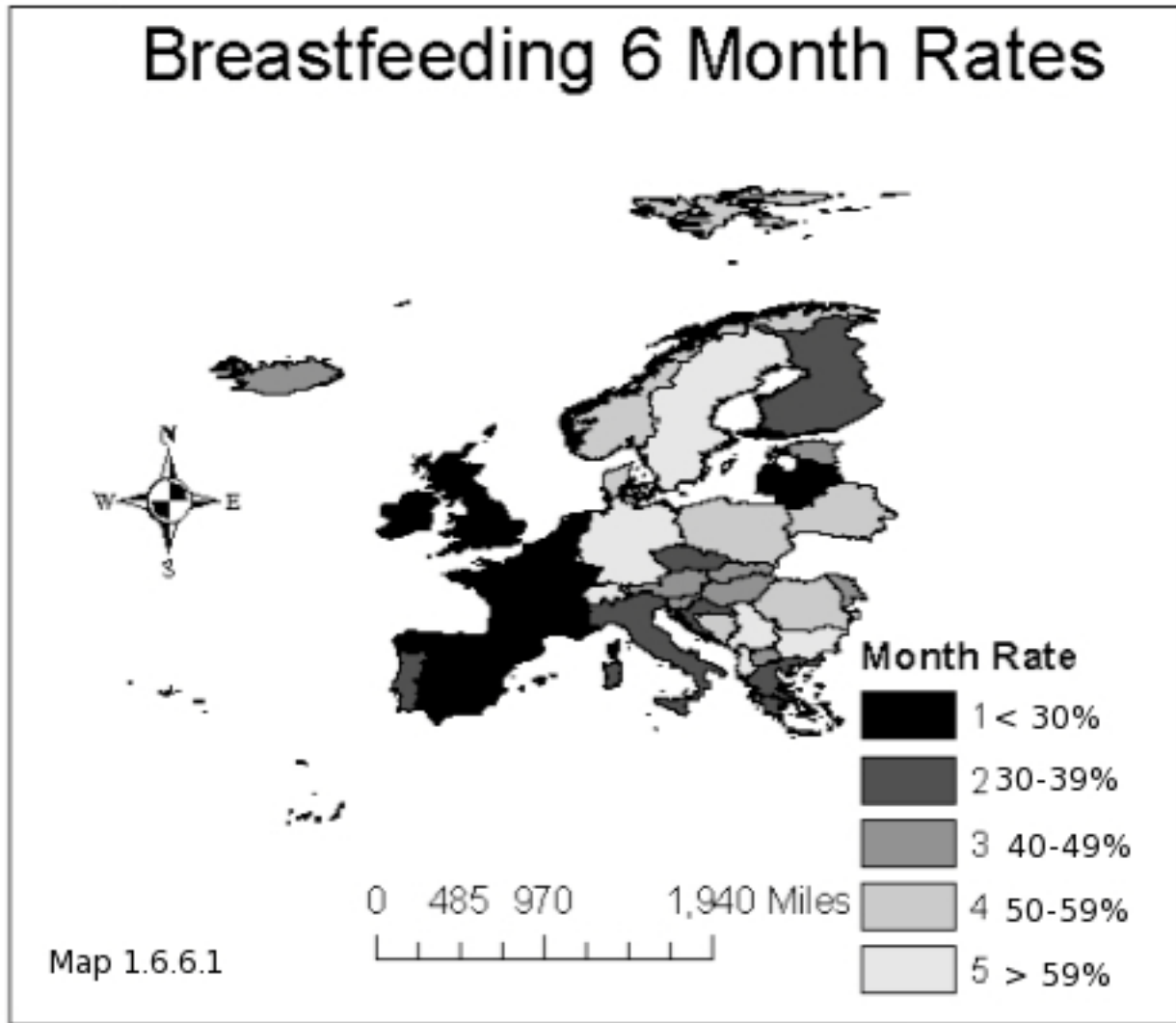
The 12 month rates were all based on breastfeeding with complementary food.

Breastfeeding 12 Month Rates

Map 1.6.6.2

0   485   970   1,940 Miles

Month Rate

1 <10%
2 10-19%
3 20-29%
4 30-39%
5 > 39%
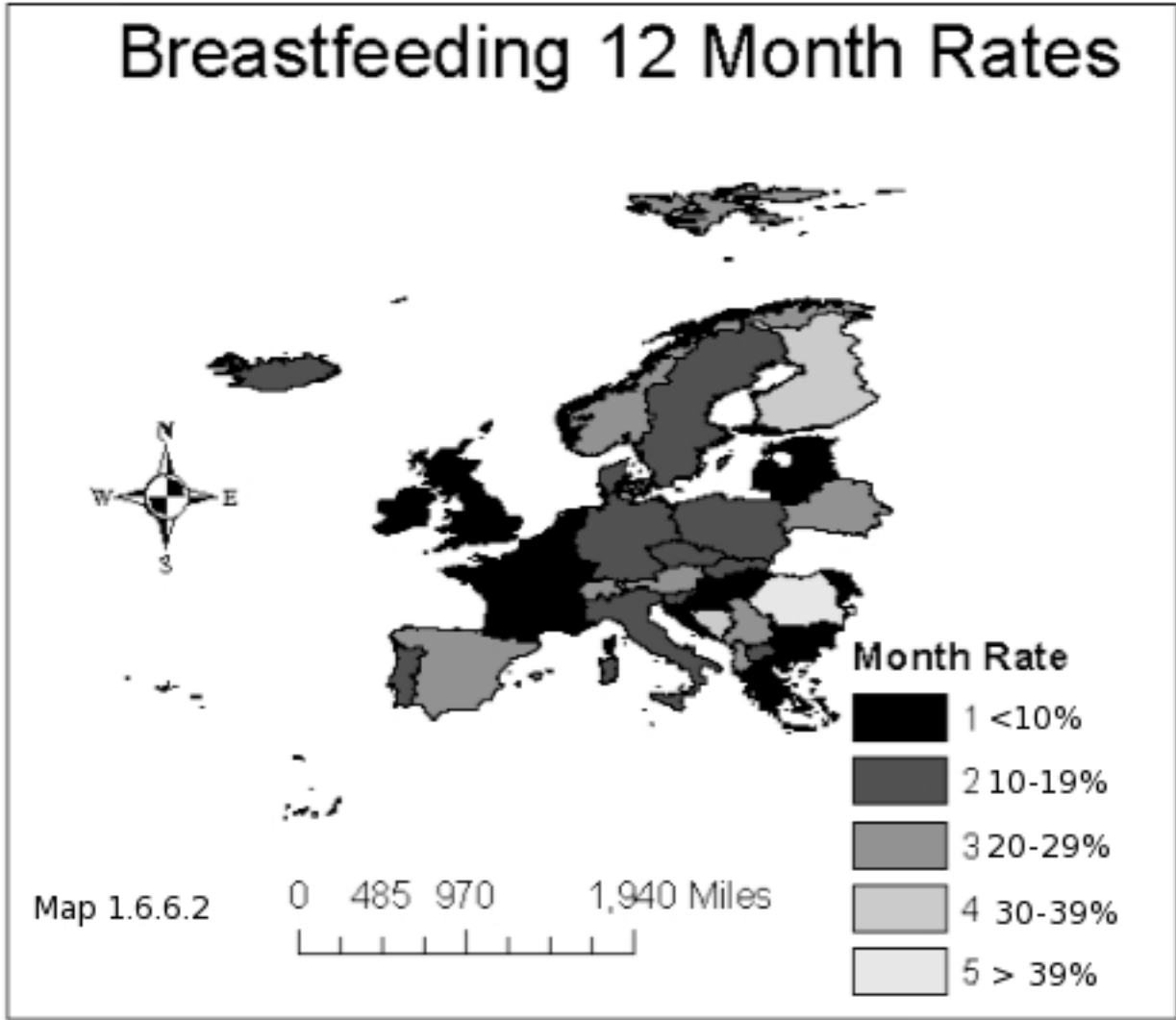
The final dependent variable is income disparity. This scale was developed using data accessed

from the WomanStats variable Employment Restrictions Based on Gender Data 1 (ERBG-Data -

1). This variable specifically examines income discrepancy between men and women. In addition

to the actual discrepancy between men's and women's incomes I felt that it was important to

assess the trajectory. In my opinion it was better to have a country with a large but rapidly

closing gap than to have a country with a somewhat lower, but persistent gender gap. I

acknowledge that the narrower the gap the harder it is to achieve substantial changes, so no

rapidly improving country was scaled as a 5 or a 4 based solely on their rate of change, but I felt

that scoring them at least a 3 was appropriate even if the over all number would not have landed

them in that category. A score of 5 is the most desirable policy.

All of the breastfeeding policies will be compared to the income disparity scale. If any of

them, or any combination thereof, result in a poorer income disparity score it will be noted in the

analysis section and would require a significant benefit in order to justify its inclusion in a policy

recommendation.

Level	Description
5	Income Disparity is lower than 10% and continues to decrease
4	Income Disparity is lower than 15% and continues to decrease – or less than 10%, but not dropping any more.
3	Income Disparity is lower than 20%. Also includes countries with higher than 20% rates – but which made a substantial increase in income gap reduction. And those states with lower gap rates – but have seen a sizable increase in the gap rate.
2	Income Disparity of 15% or higher – and continuing to increase – or remains the same.
1	Income Disparity of 20% or higher – and continuing to increase – or remains the same.
Table 1.6.6 Income Disparity Scale	

1.6.7 Scales

Data used to derive the five scales was found on the WomanStats.org website. Data on

WomanStats.org is collected from a variety of resources that include qualitative and quantitative

information as well as contemporary and historical data. Because each county produces it own

data on breastfeeding on different schedules, it was necessary to aggregate any data examined as

a single unit of time since 2005. When competing information was discovered for the same

variable and time frame I used direct source information to determine which piece of data was

more representative of the country as a whole. Any remaining discrepancies were first examined

for differences between the datasets. If it was determined that they were both equally valid samples the average of the two numbers was used to determine the final value. Where possible I only used more generalizable sources; however there were a few instances where the only data available was anecdotal. In order to reasonably compare nations, I interviewed country experts via email from resources such as La Leche League International and official government health agencies to verify the anecdotal reports. When the anecdotal evidence and the expert opinion were in agreement I used the data as a more generalizable source. Six countries required expert interview verification. In each instance the expert opinion happened to confirm the anecdotal evidence instead of disputing it, eliminating the need for any further levels of verification.

The scales that capture breastfeeding policies and contexts are even more involved. No other breastfeeding policy scale exists, so there was no existing template to use in this scale construction exercise to pattern the model on. In order to not bias the sample I did not look at any of the breastfeeding data while creating the scale. My first step in arriving at the scale was to indicate, based on the theoretical constructs, what the high and low points would resemble. Using public social acceptance of breastfeeding as an example, here is how the process would work. In order for women to feel comfortable several cultural attitudes are required. The majority of people should actively support women by encouraging them to breastfeed. This acceptance should lead to an expectation that women breastfeed in public and it should be so common that women do not feel uncomfortable doing it in public. It should be the most natural thing in the world to occur – a mother feeding her baby. This would be categorized as a 5.

On the opposite end of the spectrum, a score of 1 would be given to nations that believe that breastfeeding in public is somehow shameful and should be hidden away. One would see family members, business owners, and even strangers actively discouraging breastfeeding by

asking them to move, or cover-up. In this environment we would not expect to see much public breastfeeding.

The middle point is the next portion of the scale to be established. The middle between these extremes would be that women can and do breastfeed in public, but that there is a mixed reception. Some see it as scandalous while other are encouraging. The societal rules are not consistently applied, but there is a general acceptance of breastfeeding – even if people are not always sure how to react to it.

Creating values four and two are a little more difficult. For value 4 I choose a division based on an expected modesty standard. Mothers may be able to breastfeed in public, and may be encouraged to do so, but because there is some expectation to cover-up mother may still feel awkward if she needs to feed her child in a place where she cannot be quite as discrete. Value two also turned on the modesty standard. While a mother may be able to breastfeed in public she should expect to be asked to remove herself from the public eye, not just cover-up. Bystanders would feel uncomfortable knowing that a mother was breastfeeding nearby.

This process is repeated for each scale. First, identifying the ideal; second, proposing its opposite; third, dividing the two extremes; fourth, finding the new middle ground between values three and five and three and one. The exact scale points are indicated in the sections that follow.

1.6.8 Social Acceptance

The overall point of this scale is to assess the social pressure and acceptance for and against breastfeeding. From the WomanStats database I will use the variable called Social Acceptance of Breastfeeding Practice 1 (SAB-PRACTICE-1). Detailed descriptions of the variables are located in Appendix A. Overall we should expect a positive environment to include

a positive public debate on the topic. Women should feel free to breastfeed in public and conversations on the topic should not drive the women into the private sphere for fear of embarrassment. The following 5-point scale was created to assess each nation's practices. Currently there are no European countries that fall into a level 1. I have chosen to have a bottom scale of 1 because a future paper will assess past performance among the European countries in a longitudinal analysis where a level 1 score will most certainly exist. So while this scale point 1 is not relevant to this thesis, it will be important for future analysis.

Level	Description
5	There is active support for mothers who breastfeed. They are publicly encouraged and it is the social expectation that mothers will feed in public.
4	It is comfortable for the mothers to breastfeed in public, but there are some decency standards that apply that can make feeding in public more cumbersome.
3	It is mildly scandalous for mothers to breastfeeding in public – but it is not common for the mother to be told to go somewhere else.
2	While it is somewhat permissible for women to breastfeed in public they are not supported in their effort and can be asked to move and cover-up if there are others around them that are uncomfortable.
1	Public acceptance of breastfeeding is low and there is active disdain for mother who chose to feed in public. Public breastfeeding rarely happens.

Table 1.6.8 Social Acceptance Scale

Public Acceptance of Breastfeeding

Scale

Acceptance

(white)	No Data
(darkest)	2
(dark)	3
(light)	4
(lightest)	5

Map 1.6.8

0   480   960   1,920 Miles
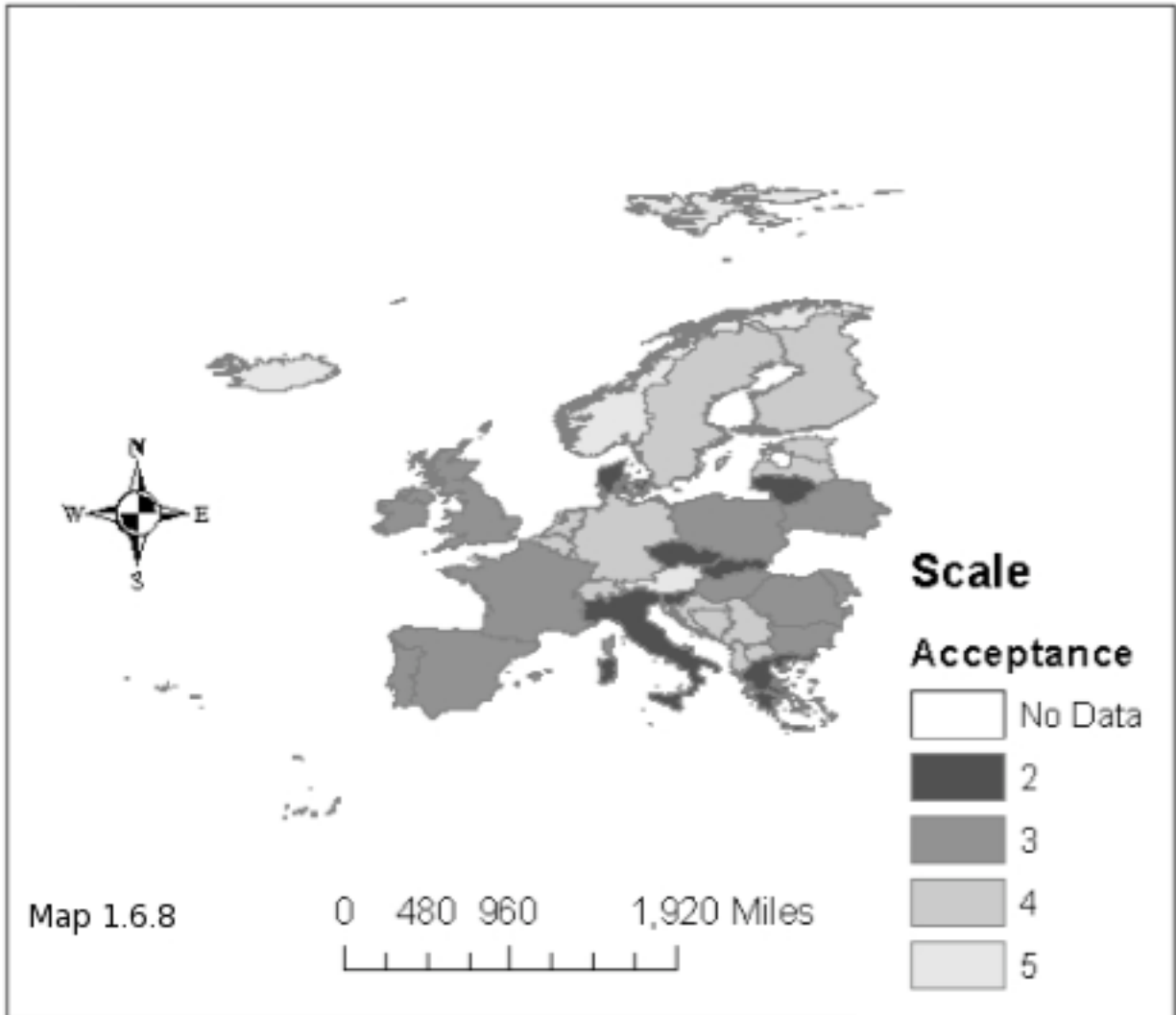
1.6.9 Resource Commitment

It has been noted that breastfeeding is not free. A society that recognizes the benefits of

breastfeeding, and acknowledges the great contribution breastfeeding makes in the public sphere,

would commit public resources in a way that would not only promote breastfeeding but also

protect the mother from the enormous financial strain that breastfeeding can cause for them.

From the WomanStats database information will be pulled from the Government Intervention in

Childbearing variable (GIC-LAW-1 and 2). Please see Appendix A for a full description. Similar

to Social Acceptance there are currently no European countries that fall into a level 1 category.

For purposes of the future paper, using a longitudinal analysis, the scale point 1 is delineated

here even though it is not being used in this particular data set.

Level	Description
5	9+ months of maternity leave, with 80% or higher income replacement, and the vast majority have easy access to the programs.
4	6-9 months of maternity leave, covers at least over 50% of the income – and the majority have access to the programs.
3	3-6 months of maternity leave with at least 80% income provided. Or longer then 6 months – but at a lower income coverage. Or there is limited access to the benefits.
2	0-3 months of maternity leave – and at least partial income loss is covered.
1	0-3 months of maternity leave. No financial protection for the time off work.
Table 1.6.9 Resource Commitment Scale	

Maternity Resource Commitment

Scale Resource Commitment
- 2
- 3
- 4
- 5

Map 1.6.9

0   485   970   1,940 Miles
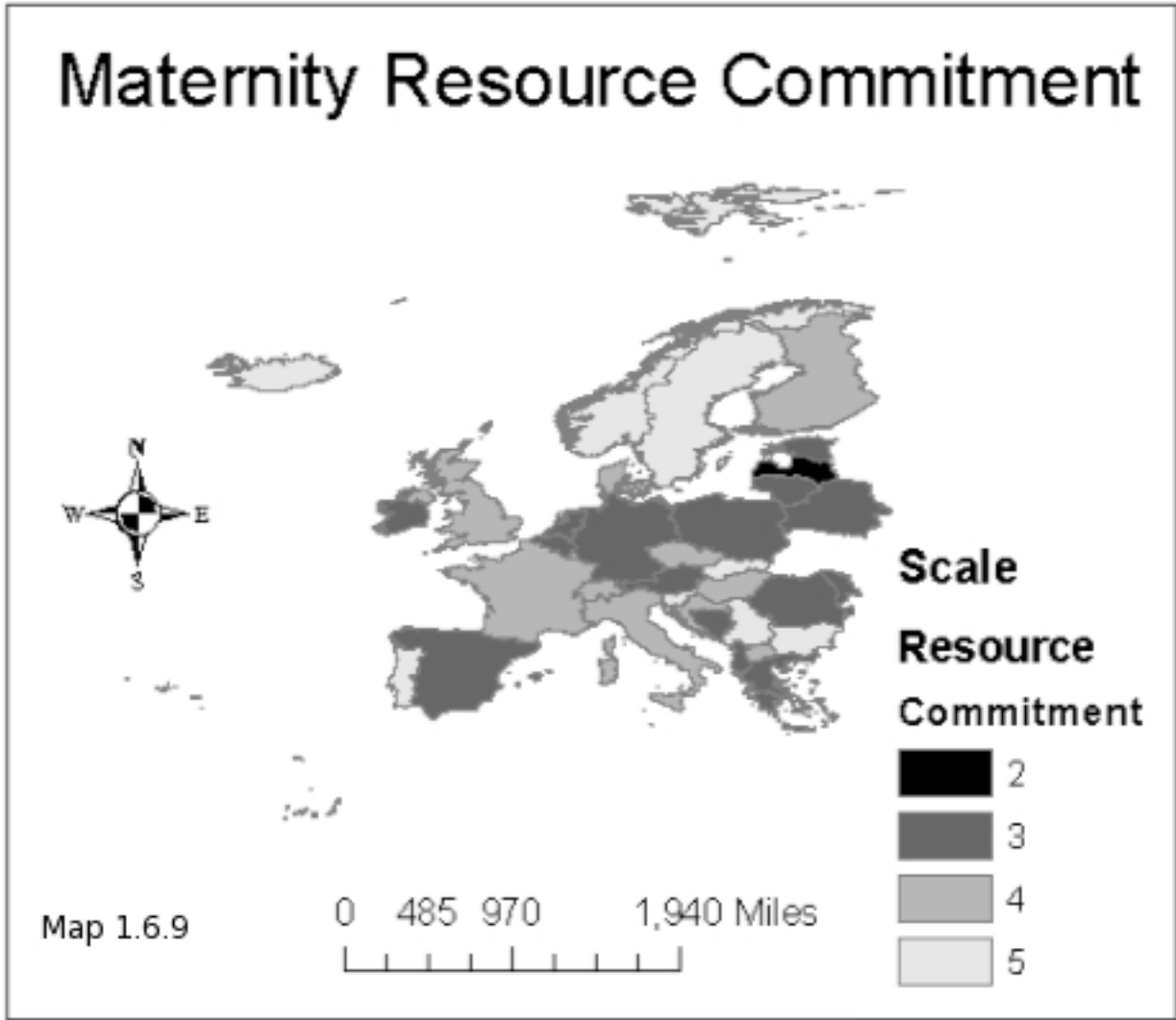
1.6.10 Laws Regarding Breastfeeding

At best, laws would not only govern the treatment of women in public spaces outside, but would also protect women in any establishment including their place of work, require that reasonable accommodation be made to support women who breastfeed, and allow their work to be organized around the breastfeeding schedule where reasonably possible. WomanStats variables Social Acceptance of Breastfeeding Law 1 and 2 (SAB-Law-1 and 2) were used to collect this information. See Appendix A for more details on the variable. The following scale was developed and employed here.

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Level	Description
5	Legal in both public and business space – and there are requirements to make accommodations for breastfeeding mothers.
4	Legal in both public and business space.
3	Legal, but there are substantial decency standards that effectively limit mother's public rights – such as breastfeeding in the workplace.
2	Legal to breastfeed in public, but there are significant restrictions on where and when, and requirements that they must be covered.
1	No legal protection for breastfeeding mothers.

Table 1.6.10 Degree of Legality Scale

Map 1.6.10

Legal Breastfeeding Protection

Legal Scale

1
2
3
4
5
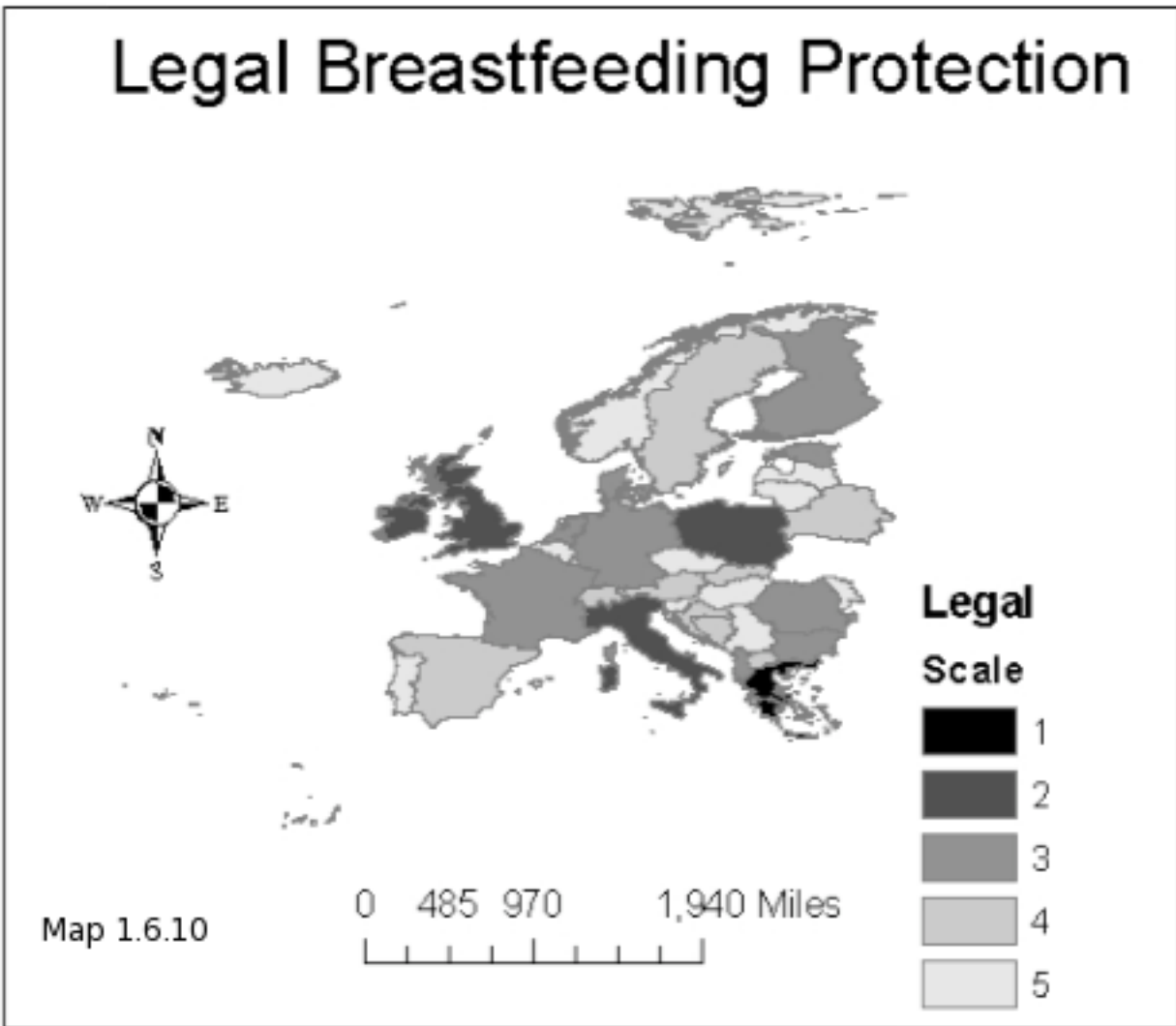
1.6.11 United Voice

With so much supportive evidence available, in spite of the recent history of recommendation flip-flops on the value of breastfeeding, we expect to see a substantially united voice between the health care professionals, scientists and politicians promoting breastfeeding in society. Without a consistent and sustained voice we would expect to see mediocre overall rates and stagnant movement towards increasing the breastfeeding rates. In order to access this scale, data was pulled from variables Social Acceptance of Breastfeeding Practice 1 (SABP-Practice-1) and Social Acceptance of Breastfeeding Law 1 (SABP-Law-1). Further information on these variables is available in Appendix A.

Level	Description
5	The vast majority of authoritative sources actively promote breastfeeding. Unified policy.
4	There is a general acceptance that breastfeeding is best for the mother and child, and there are general promotional strategies in place to encourage breastfeeding. However, the Baby Friendly Hospitals initiative is not universally required, nor is the message for breastfeeding or against formula uniform.
3	Mixed message. Various groups of authority send mixed messages on the value of breastfeeding. There is not a promotion of Baby Friendly Hospitals. So while there may be some groups that are actively promoting breastfeeding there are others that are just as influential pushing a contradictory stance.
2	There is a policy of discouragement of breastfeeding – however it is not as vocal or prolific.
1	There is an active promotion of formula use among the various professional organizations involved in mother and infant care.
Table 1.6.11 Degree of United Voice Scale	

United Voice Favoring Breastfeeding

Map 1.6.11
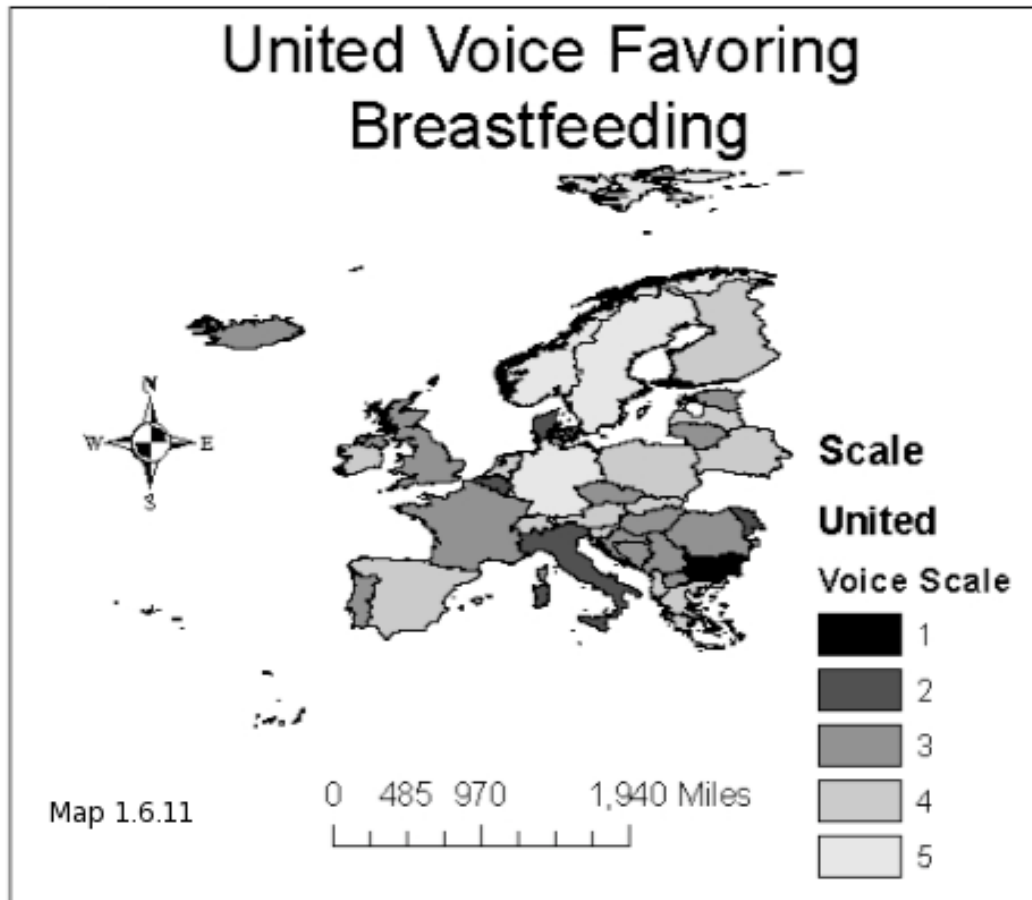
1.6.12 Media and Formula Laws

Due to recent evidence on the importance of controlling media access to mothers, this variable was important to include. However, it does not break down into a simple 5-point scale. I decided to create a 3-point scale based on 1, 3, and 5 to match with the overall scores of the other scales. As the middle point I used the European law that bans formula companies from advertising in hospitals for babies between zero and six months old. As a departure from this, if the law was not enforced, or if there were no laws (for the European nations that are not in the EU), then it was coded as a 1. If the country had instituted more strict regulations, then they were scored as a 5. It may have been possible to develop a true 5-point scale, but there was not enough data available, even after doing interviews with some country experts, to determine a clearly

defined break more refined than a 3-point scale. Information for this scale was again pulled from the WomanStats Database, Social Acceptance of Breastfeeding Law 1 (SAB-Law-1). Please see Appendix A for details.

Level	Description
5	Formula advertising is not allowed in hospitals, TV or other forms of media.
3	Formula advertising is not allowed in hospitals for the first 6 months, but other media outlets such as TV, magazines, radio etc are allowed to varying degrees.
1	Advertising is allowed everywhere. There are little to no restrictions or formula companies are regularly allowed to break the rules.
Table 1.6.12 Advertising Regulation Scale	

Formula Advertisement Controls

Map 1.6.12

Scale Advertising Control

Scale
1
3
5

0 485 970 1,940 Miles
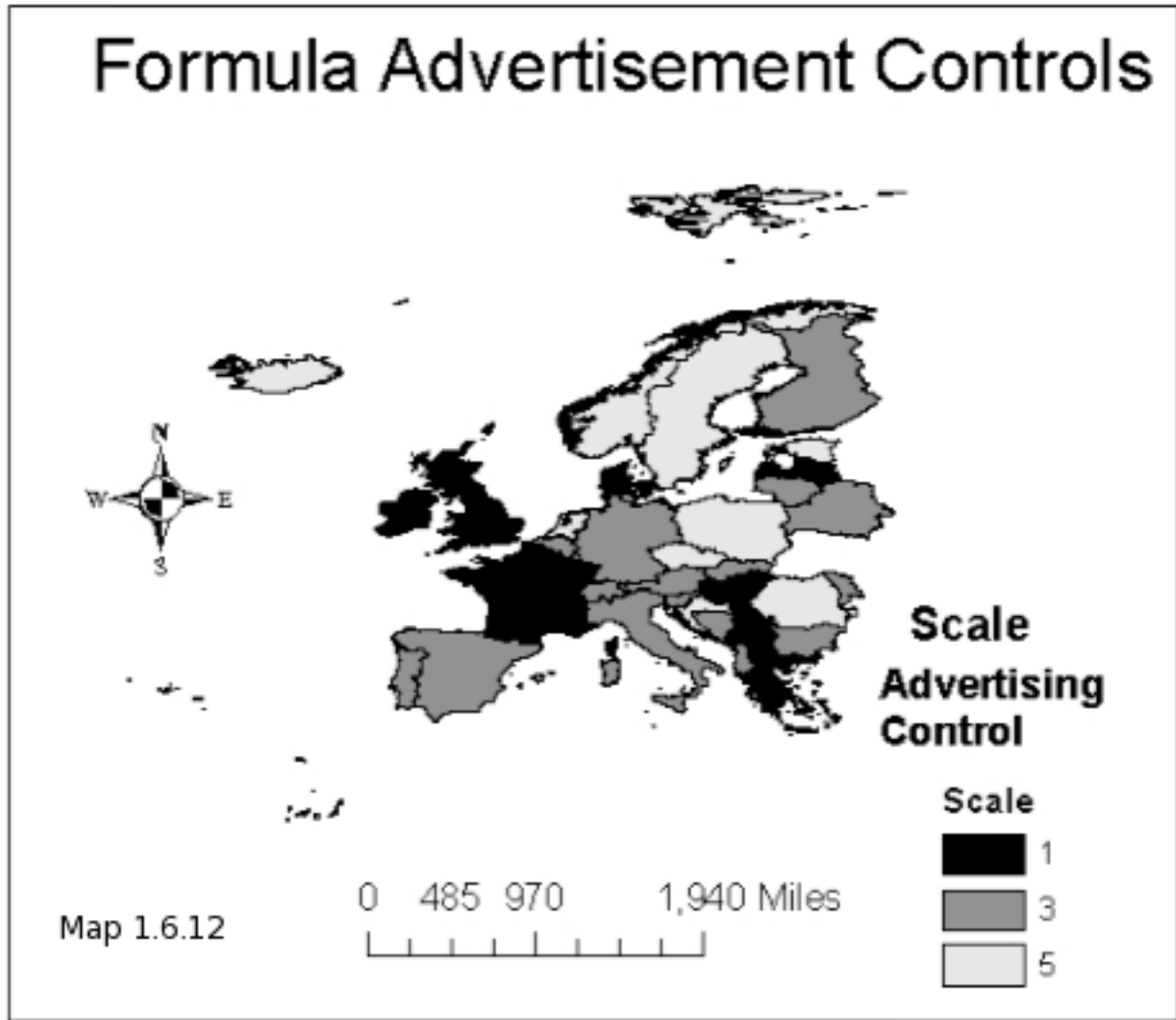
1.6.13 Scale Average

Hypothesis 2 is an assessment of the degree to which a country has implemented a comprehensive breastfeeding policy and environment. In order to test this hypothesis all five scale values were summed and then divided by five to obtain the average. The original data measured every scale in five point increments. However, after performing the average, additional gradation was possible in the variables. Because this is ordinal level data, averaging the scales together created scores with decimal points. These additional decimal points do not indicate interval or ratio level data and the multinomial regression model requires that each variable be in

an ordinal level scale. It was then necessary to return to the original five point scale coding. A decision had to be made on when to round up or down. The purpose of the scale is to assess how well a country is implementing or displaying the five contextual variables in their society. The theory I have posited states that the cumulative effect of all five factors will lead to higher breastfeeding rates. If a country had, for example, a score of 3, 3, 3, 3 and 5 for each of the five factors, respectively, the average score would be 3.4. If I were to create a scale that rounded based on the the model of 2.5 and higher rounding up to a 3, and 3.49 and lower rounding down to a 3, then this country would not receive "credit" in the analysis for the positive presence of a higher scale point. In short this rounding scheme would not capture the variation I intend to capture in the model. In order to capture the positive effect that better implemention may have over all, I chose to implement a rounding scheme that rounded 4.01 to 4.99 up to 5, and so forth for each of the five levels.

1.6.14 Data

Eight different data points are used to assess Model 2. Each one will be explained in turn. The first data point assesses the percentage of women in parliament. I did not make a distinction between an upper or lower house, only the total percentage of women in parliament. No country had more than more than 43% of its parliament filled by women. The scale range then was easy to assess as level 5: 40-49%. Level 4: 30-39%. Level 3: 20-20%. Level 2: 10-19% and Level 1 0-9%.

Income per capita is also a straight-forward measure based on data accessed from World Bank 2008 figures for GDP at PPP and divided per capita. The figure produced is a range of incomes between 50-59 thousand, 40-49 thousand, 30-39 thousand, 20-29 thousand and 10-19

thousand, with Luxembourg as the only outlier at $78,000. For this scale I decided to include Luxembourg in the Level 5 with the other incomes between 50-59 thousand.

I wanted to capture the degree to which a nation invests in it people through its social welfare program and how that might impact breastfeeding rates. Unfortunately there is not a simple measure that would directly assess resources committed to programs that might directly impact breastfeeding. A proxy variable was then needed. Based on the available data the closest expenditure that might reflect a nation's investment into the health and well-being of its people is expenditures in health care. Data was gathered from the OECD based on 2008 figures. The range was between 1 and 10% of a nation's budget spent on public health with Switzerland as an outlier, committing 12% of its budget to health expenditures. The following 5 levels were created with Switzerland added to level 5; Level 5: 9-10%, Level 4: 7-8%, Level 3: 5-6%, Level 2 3-4% and Level 1: 1-2%.

The division between East and West is not based on current ethnic, geographic, or linguistic divisions. The demarcation I have chosen to use is based on the old Cold War divisions that continue to affect the development of many of the former Soviet republics. This is also a convenient measure of rich and poor European nations. The poorest nations are those which were under Soviet occupation for so long. Thus for purposes of this paper, Eastern Europe consists of the following countries: Albania, Belarus, Bosnia & Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Serbia, Slovakia, and Slovenia. Western Europe refers to the following nations: Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland.

Religious dominance of either Catholicism or Islam may also be a factor. Both religions have official positions promoting breastfeeding. To calculate religious dominance I used data on the percentage of a country's population that belongs to a particular religious sect from the CIA World Factbook. If the majority of a country's population ascribed to either Catholicism or Islam this variable was coded as a 1. While there is not an official statement on breastfeeding practices from the various versions of the Orthodox churches in Europe, they do constitute a similarly organized religious organization. Because of their affiliation, albeit a loose one, I determined to code each majority Orthodox country as a 2. The remaining countries, which were either predominately Protestant with no religiously tied doctrine or countries that did not have a predominate religion, were coded as missing.

Religious affiliation does not indicate religious compliance. While compliance is a difficult measure to assess, the most reasonable proxy variable appeared to be importance of religion in a person's life. The assumption is that a people who consider religion to be important in their life would be more likely to conform to the teachings of that religion. This data was only recorded for countries with a religious dominance score of 1 as described above. Protestant religions, as described above, do not have a clear, consistent, or uniform policy among the various denominations present in Europe. States with a predominance of protestant adherents were recorded as missing in the religious dominance score because of that diversity. Likewise, for this variable, the protestant nations did not receive a compliance score because it is not possible to know if they are complying with any particular set of beliefs that might promote or discourage breastfeeding. In short, religious compliance was assessed only for those countries that had a dominant religion. Data was pulled from the 2005 World Values Survey. The WVS information was supplemented as needed for any missing data by news sources and/or journal

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articles. Because no single source was available and I could not assess the comparability of the different sets of data I opted to code each country on a 5 point scale. Based on the data from the World Values Survey the highest category are countries where over 50% of the population considers religion important in their life. No country that was predominantly Islamic or Catholic scored less than 10%. This created natural breaks at Level 5: 50+%, Level 4: 40-49%. Level 3: 30-39%. Level 2: 20-29%. and Level 1: 10-19%.

Finally, to examine the effect of college education on breastfeeding rates, data was accessed from UNESCO Institute for Statistics on Tertiary Enrollment. The highest level of enrollment was 56% for Finland. There are natural breaks in the 50+%, 40-49%, 30-39%, 20-29% and 10-19% ranges with only 2 countries reporting less than 10%. There was only one country in the 10-19% range and because of the lower numbers I decided to group these bottom three into the lowest category to make a grouping that could possibly be correlated with the dependent variables.

There are a total of 36 countries that comprise modern day Europe. There are no missing variables in the dataset. Tables 1.6.13 and 1.6.14 both contain the data used for this analysis. For convenience it has been divided into two tables listed by eastern and western nations. The terms Eastern and Western are used here signify the old designation during the Cold War. There are 18 nations in each table.

East_Country	0month_Rank	6rank	12rank	IncDisperity	Social-Accept	Resources	Laws	United-Voice	Media	Ave_5scales_Rank	Politics_Rank	Income_Per_Capita	Welfare_Expenditures	East-West	Religious_Dominance	Religious_Attendence	College_Education
Montenegro	3	4	3	2	3	5	5	4	3	4	2	1	1	1	3	1	2
Slovakia	4	3	2	1	5	5	4	4	3	4	2	3	2	1	2	4	2
Croatia	5	2	1	3	4	4	4	3	5	4	1	3	3	1	4	2	2
Slovenia	4	3	2	5	5	5	5	4	3	4	1	3	3	1	1	4	5
Belarus	2	4	3	1	3	3	4	4	3	3	4	2	1	1	4	1	4
Romania	3	4	5	4	3	3	3	3	5	3	1	2	1	1	4	2	2
Moldova	4	3	1	1	3	3	5	2	3	3	1	1	1	1	5	2	2
Serbia	3	5	3	1	4	5	5	3	2	3	4	1	1	1	4	4	2
Bulgaria	2	5	1	3	3	5	3	1	3	3	2	2	1	1	4	4	2
Lithuania	2	1	1	3	2	3	5	3	3	3	3	2	1	1	3	1	4
Estonia	1	3	1	2	4	3	3	3	5	3	3	2	2	1	1	1	4
Albania	5	5	3	1	4	3	3	4	3	3	1	1	2	1	3	3	1
Macedonia	4	3	2	3	4	4	4	3	2	3	1	1	2	1	2	2	2
Poland	4	1	2	4	3	4	2	4	5	3	2	1	2	1	4	5	5
Latvia	1	1	1	3	4	2	5	4	1	3	3	2	2	1	1	1	5
Bosnia & Hercegovina	4	4	4	3	4	3	4	3	3	3	2	2	2	1	1	4	1
Czech Republic	4	2	2	1	2	4	5	3	5	3	3	3	3	1	1	1	2
Hungary	1	3	1	4	3	4	5	3	1	3	1	3	3	1	1	2	3

Table 3.5.2 Easter European Country Scale Scores

West_Country	0month_Rank	6rank	12rank	IncDisperity	Social-Accept	Resources	Laws	United-Voice	Media	Ave_5scales_Rank	Politics_Rank	Income_Per_Capita	Welfare_Expenditures	East-West	Religious_Dominance	Religious_Attendence	College_Education
Sweden	5	5	2	5	4	5	4	5	5	4	5	5	5	0	4	1	4
Norway	5	4	3	4	5	5	5	5	5	4	5	5	5	0	4	1	4
Iceland	5	3	2	3	5	5	5	3	5	4	5	5	5	0	4	1	4
Spain	3	1	3	4	4	3	4	4	3	3	4	4	3	0	5	2	4
Luxemburg	3	4	1	4	4	4	4	4	3	3	3	4	4	0	4	1	1
Finland	4	2	4	2	4	4	3	4	3	3	5	5	4	0	4	1	5
Portugal	5	2	2	3	4	5	5	3	3	3	2	4	4	0	4	4	3
Netherlands	2	1	1	3	4	3	3	4	5	3	5	1	5	0	1	3	3
Austria	5	3	3	3	5	3	4	4	3	3	4	4	5	0	3	3	2
Belgium	1	1	1	5	4	4	5	2	3	3	5	5	5	0	3	1	3
Germany	3	5	2	1	4	3	3	5	3	3	5	4	5	0	1	1	2
Switzerland	4	5	3	2	4	4	4	4	3	3	4	4	5	0	1	1	2
Greece	2	2	1	5	2	3	1	4	1	2	1	3	3	0	5	2	5
Ireland	1	1	1	5	3	3	2	4	1	2	2	4	4	0	4	5	4
Great Britain	1	1	1	3	3	4	2	3	1	2	3	5	5	0	3	2	3
Italy	2	2	2	5	2	4	2	2	3	2	2	5	5	0	5	4	3
France	1	1	1	4	3	4	3	3	1	2	2	5	5	0	4	2	3
Denmark	5	4	2	4	2	4	3	2	1	2	5	5	5	0	5	1	3

Table 3.5.1 Western European Scale Scores

Table 1.6.16.3 contains a count of the number of countries in each of the 5 scale levels for each variable to be tested in the two models.

Scale Value	0month_Rank	6rank	12rank	Inc Disparity Scale	Social-Accept Scale	Resources Scale	Laws Scale	United-Voice Scale	Advertising Scale	Ave 5 scales	Women in Politics	Income Per Capita	Welfare Expenditures	Religious Dominance	Religious Attendance	College Education
5	8	6	1	6	5	9	12	3	9	0	8	9	12	5	2	5
4	9	7	2	8	16	13	10	15	0	7	5	7	4	14	7	8
3	6	8	8	11	10	13	9	13	18	23	6	6	6	6	3	8
2	6	6	11	4	5	1	4	4	2	6	9	7	7	2	9	12
1	7	9	14	7	0	0	1	1	7	0	8	7	7	9	15	3

Table 1.6.16.3 Country Count Within Scale For Each Variable

Checking for normal distribution of the data, I calculated and saved the residuals and plotted them against the expected normal distribution curve. Based on figure 1.6.16 and the kurtosis and skewness statistics, I judged the data to be approximately normally distributed with a slightly positive skew and slightly platykurtic. With the consideration that this is a social science dataset and not a physical science dataset, this approximation to a normal distribution is actually quite acceptable.

Three other types of variables merit consideration, but are beyond the scope of this paper and must be left for future analysis. First, it must be acknowledged that the promotion of breastfeeding may produce an undesirable level of social pressure on the woman. Social psychological analysis should be conducted in order to more fully comprehend the mental pressure levied on women by the "Breast is Best" campaign. While these social pressures are extremely valuable in encouraging women to breastfeed, policies should not have a detrimental effect on women who cannot, or choose not, to breastfeed. Even while obtaining a public good

such as 100% breastfed babies, such a goal cannot come at the expense of the mental health of the women of the nation. Creating an environment that is hostile to either breastfeeding or bottle-feeding mothers is not useful to the society at large and either way may damage women. Like the other unintended consequences I am measuring in this paper (income disparity), this too must be understood and avoided. Unfortunately at this time no data exists to assess this variable and it would require extensive focus group studies and surveys in order to accurately measure mental distress over breastfeeding.

The second variable is cost. Well-designed programs should actually reduce overall costs in the system. This statement presents many deontological issues. The current system of measurement would need to be modified in order to accurately and ethically account for all of the true costs and benefits in the system, as argued for by Marilyn Waring in her influential book Counting for Nothing (1999). This is not an easy task. Reproductive labor is not assessed in any national level accounting system. Thus any program supporting breastfeeding will be seen as a "drain" on the system without calculating its substantial benefit as well. If the accounting system has no mechanism to measure the benefit of breastfeeding, it will be difficult for politicians to implement, especially in societies that are accustomed to more traditional roles for women. While this is a critical political step to consider when implementing a national policy on breastfeeding, the purpose of this section is narrower in that I desire to show the policies one must consider in order to develop a comprehensive program. Nevertheless, I raise this point because any talk of public policy must consider the cost of the action. It is my hope that future research will be conducted that will outline in detailed analysis the true costs and benefits of a breastfeeding so that policy makers may have the most accurate data available for assessing the allocation of public assets.

Finally, this analysis is focused more on macro level processes that society uses to construct a positive or negative environment for breastfeeding mothers. There are other factors that researchers have pointed out make a significance difference in the breastfeeding rates at the individual level. Harner and Holly demonstrate that the age of the mother makes a difference in the breastfeeding rates, with mothers who choose to wait longer to have children being more likely to breastfeed (Harner and McCarter-Spaulding 2004, and Peterson and LaVanzo 1992). Couple interaction also plays a significant role in breastfeeding rates, where mothers are more likely to breastfeed if they have a supportive husband to help in the family labors (Falceto et al 2004). While these findings are significant, it is not the purpose of this paper to assess which is more important - the macro or micro level variables - but to only assess the macro level at this time.

1.7 Analysis and Trends

An ordinal logistic regression model would have been appropriate, however while preparing the data for analysis I discovered that the proportional odds assumption had not been met. This eliminated the ordinal logistic regression model as the ideal tool for the statistical analysis. When the proportional odds assumption is not met, it is possible to substitute the multinomial regression model. Because of the relaxed assumptions on the relationships between the variables it is the most appropriate model for this sample. While the model will not treat the data as interrelated, all of the scales were still created on a five-point system with scale-point one at the bottom and scale point five at the top. To facilitate interpretation, the base outcome variable was set to 1 so that all comparisons could be made in relationship to the lowest category. A multinomial regression model does not rank the levels sequentially in the analysis as each

level is treated as a nominal value. However in practice the data is actually ordinal and will be displayed as if it was ordinal data. The interpretation, however, cannot be understood at that level of analysis. I believe that it will be less cumbersome to refer to them in reference to a base category that for practical purposes is actually the starting point of a ranked scale.

1.7.1.1 Model 1 - Results and Discussion

Model 1 examined the five contextual variables and evaluated each as an independent variable. This first model represented actions that a society could pursue in order to create a breastfeeding environment that would increase the short term and long term breastfeeding rates. My hypothesis was that these five contextual variables (social acceptance, resource commitment, legal protection, a united voice and advertisement control) would not be statistically correlated to any of the three breastfeeding periods (birth, six months and twelve months), and that they would also not be correlated to increased risk to women as measured through income disparity. These are the initial results from the multinomial **regression analysis.**

H1: For the initial breastfeeding rate period there will be no statistical association between the breastfeeding rates and the five contextual variables evaluated individually. Hypothesis 1 is partially rejected. While there was not a clear trend among all of the variables there were a few independent variables that produced statistically significant results for various levels of breastfeeding rates. Level 1 was used as the base category in each multinomial logistic regression. Table 1.7.1.1.1 lists the significance levels for each of the different policies and time frames. For initial breastfeeding rates, media controls were statisitcally significant at breastfeeding levels 2, 4 and 5. This would suggest that the regulation governing where formula

companies can advertise - and in particular ensuring that they cannot advertise in hospitals - is a extremely important independent variable for producing higher initial breastfeeding rates.

Breastfeeding Rates	Rate 1	Rate 2	Rate 3	Rate 4	Rate 5
Media Control @ 0 months	Base	0.050		0.042	0.023
Acceptance @ 0 months	Base	0.051	0.047		
Resources @ 0 months	Base				0.051
Media @ 6 months	Base	0.032			
Resources @ 6 months	Base	0.018		0.032	0.022
Table 1.7.1.1.1 - Model 1 Significance Levels					

Also for the initial breastfeeding rate period, social acceptance of public breastfeeding was statistically signifcant in the mid level breastfeeding range for rate 3 and just barely missing standard statiscally significance at rate 2. Resource commitment just barely missied statistical significance in the initial breastfeeding rate 5 category.

Because the sample size created some difficulties with the standard errors it was desirable to also test Model 1 with rank correlation statistics as a cross check to the multinomial regression. Because my dataset did not have at least five cases for each category, I was not able to meet all the assumptions of the Chi Square test. This same requirement however was not necessary for Kendall's Tau-b, Gamma, Pearson's R and Spearman's Rho.

Variable	Time Period	Test	Value	Std Error	Approx T	Approx Sig
Social Acceptance	0 mon	Tau-b	0.353	0.121	2.887	0.004
	0 mon	Gamma	0.460	0.153	2.887	0.004
	0 mon	Pearson's R	0.391	0.142	2.479	0.018
	0 mon	Spearman's	0.425	0.144	2.735	0.010
Resource Commitment	0 mon	Tau-b	0.315	0.125	2.487	0.013
	0 mon	Gamma	0.422	0.161	2.487	0.013
	0 mon	Pearson's R	0.388	0.137	2.452	0.019
	0 mon	Spearman's	0.374	0.143	2.349	0.025
Laws	0 mon	Tau-b	0.192	0.143	1.332	0.183
	0 mon	Gamma	0.245	0.180	1.332	0.183
	0 mon	Pearson's R	0.264	0.159	1.593	0.120
	0 mon	Spearman's	0.228	0.172	1.363	0.182
United	0 mon	Tau-b	0.154	0.138	1.103	0.270
	0 mon	Gamma	0.206	0.182	1.103	0.270
	0 mon	Pearson's R	0.215	0.150	1.281	0.209
	0 mon	Spearman's	0.186	0.165	1.103	0.278
Media	0 mon	Tau-b	0.377	0.151	2.453	0.014
	0 mon	Gamma	0.499	0.188	2.453	0.014
	0 mon	Pearson's R	0.439	0.165	2.850	0.007
	0 mon	Spearman's	0.428	0.168	2.763	0.009
Table 1.7.1.1.2 Model 1 Initial Breastfeeding Rate Correlation Statistics						

These correlation statistics confirm that as individual variables - social acceptance, resource commitment, and media advertising controls - each contribute significantly to the overall breastfeeding rates initiated at birth. Of these three, media control is the most important variable, accounting for the greatest amount of variation and the highest level of significance. This is not unexpected. If there is restricted access to formula information, except under the direction of a doctor while you are in the hospital, and if there is little exposure after a mother

leaves the hospital, it is hard to imagine that would not have a positive impact on initial breastfeeding rates.

H1: These tests lead us to the partial rejection of hypothesis 1, that no individual contextual variable would prove to be significant in its own right. We can claim from the statistical test that for the initial breastfeeding rate period that social acceptance of breatfeeding, resource commitment and media advetising controls are important to successful national breastfeeding programs. The multinomial regression allowed us to see that each of these three variables were only significant for certain levels of breastfeeding. These finding do indicate that each of the five contextual variables can be associated with higher breastfeeding rates but not under all conditions. For instance, social acceptance of breastfeeding was only significant at the breastfeeding rate 3 level, the middle score.

H2: It was postulated that for the six month breastfeeding rate period there will be no statistical association between the breastfeeding rate and the five contextual variables. Hypothesis 2 is also partially rejected. Looking at table 1.7.1.1.2 there are two variables that continued to show some level of significance in the 6 month breastfeeding rate period. Media advertising controls were still significant for the countries with breastfeeding rate 2 scores. And of particular interest is that the resource commitment score moved from no statistical significance for any level of breastfeeding rates for the initial breastfeeding period at birth, to three breastfeeding rate levels (2, 4 and 5) being significant in the six month time period. Upon examining the correlation statistics, only one variable is close to statistical significance. Recall that resource commitment at the 6 month level is highly significant in at least 3 of the 5 breastfeeding rate categories (see table 1.7.1.1.3) I am going to accept the more sophisticated

model results as being the proper interpretation of the significance of resrouces at the 6 month period.

Variable	Time	Test	Value	Std. Error	Approx T	Approx Sig
Resources	6 month	Tau-b	0.236	0.166	1.951	0.051
	6 month	Gamma	0.342	0.163	1.951	0.051
	6 month	Pearson's R	0.317	0.146	1.947	0.060
	6 month	Spearman's	0.388	0.159	1.752	0.089
Table 1.7.1.1.3 Model 1 Six Month Correlation Statistics						

H3: For the twelve month breastfeeding rate period there will be no statistical association between the breastfeeding rate and the five contextual variables, and H4: These individual breastfeeding contextual factors will not negatively impact women's vulnerability in the market as assessed by income disparity. These were both accepted. There were no explanatory variables, at any score level, with any statistical significance for either the twelve month breastfeeding rate or income discrepancy.

Media control also shows up as significant in the 6 month range for those who scored a level 2. When examining the data a clear pattern emerges that countries with poor breastfeeding performance (level 1 or 2), by and large, do not have strict laws forbidding formula companies from advertising in the media or in hospitals. But level 1 and 2 scores on breastfeeding only account for about 1/3 of the countries in the dataset. A full 2/3 did have strict laws against advertising, however these laws on advertisements do not show any statistical relationship between their implementation and longer term breastfeeding rates. Its impact on the initial breastfeeding rates is substantial, but it appear to lose power as an explanatory variable as time

goes on. Looking even further out, it would appear that any residual effect the formula advertising regulations might present in the 6 month range are gone completely by 12 month marker.

These are interesting results but alone do not provide enough evidence to accept the hypothesis that each individual contextual factor will influence breastfeeding directly. There are moments when each of the five appear to be more influential than others, but the results were not consistence enough to judge their overall significance as there appear to be some exogenous variables not accounted for in Model 1. We need to explore other options for detecting correlations between policies and practices. The resource commitment results are very interesting and will be addressed in greater detail below.

1.7.1.2 Model 2

Model 2 was designed to test for an interaction effect between all of the five contextual variables. I argued that it would be the combined effect of each of the variables that would make the most significant contribution to overall breastfeeding rates. Four Hypotheses (H5-H8) were tested under Model 2. H5: postulated that as the average breastfeeding score for all five variables increased so would the association with higher breastfeeding rates for the initial breastfeeding rate period. Examining Table 1.7.1.2 the following pattern is revealed.

Average Factor Level	0 months	6 months	12 months
1	base	base	base
2	0.742	0.070	0.010
3	0.071	0.006	0.021
4	0.042	0.022	0.202
5	0.008	0.029	0.341
Table 1.7.1.2.1 Multinomial regression significance levels based on average breastfeeding rate for the period 0, 6, and 12 months			

The multinomial regression used level 1 as the base level category. Levels 2 and 3 are not statistically significant, but as the breastfeeding average score continues to rise to level 4 and 5 the statistical strength of correlation also increases in accordance with Hypothesis 5. Hypothesis 5 is accepted.

H6: For the six month breastfeeding rate period, the average of the five contextual scores will have significant correlations between it and the six month breastfeeding rate. Model 2 made the same argument for the 6 month rate and based on the result displayed in Table 1.7.1.2 Hypothesis 6 is also accepted.

H7: For the twelve month breastfeeding rate period, the average of the five contextual scores will have strong correlations between it and the twelve month breastfeeding rate. Hypothesis 7 displays the reverse pattern. When testing for the relationship between the average score of the five factors and the 12 month rates we can see in Table 1.7.1.2 that only levels 2 and 3 are significant with levels 4 and 5 dropping out of significance. This is an interesting puzzle that will require further analysis to understand the association. At this point Hypothesis 7 is rejected.

H8: The average of these breastfeeding contextual factors will NOT adversely impact women's vulnerability in the market as assessed by income disparity. This hypothesis was accepted. There was no statistical association between the five factors average and income discrepancy.

In addition to the multinomial regression I also ran the same four tests used in Model 1 to test for level of association. Table 1.7.1.2.2 shows the results. There is a very high level of association between the averaged score of all five variables and initial breastfeeding and 6 month measure. For the 6 month rate the Pearson's R and Spearman's test did not return a significance level below .05. However, because all other measures were significant and because the more sophisticated multinomial regression was significant, the lack of significance in these two scores was not enough to warrant a rejection of Hypothesis 6.

Variable	Time Period	Test	Value	Std Error	Approx T	Approx Sig
Average of the five factors	0 mon	Tau-b	0.497	0.122	3.665	0.000
	0 mon	Gamma	0.710	0.157	3.665	0.000
	0 mon	Pearson's R	0.555	0.123	3.891	0.000
	0 mon	Spearman's	0.555	0.136	3.886	0.000
Average of the five factors	6 mon	Tau-b	0.234	0.106	2.126	0.034
	6 mon	Gamma	0.361	0.157	2.126	0.034
	6 mon	Pearson's R	0.297	0.120	1.815	0.078
	6 mon	Spearman's	0.287	0.137	1.744	0.090
Table 1.7.1.2.2 Model 2 Initial and Six Month Correlation Statistics						

Because Model 1 had some variables for some time periods that were significant and Model 2 did as well, it is important to ascertain which of the models fit the data best. AIC and

BIC scores are a measure of the variation that is accounted for in each model. In effect it is a measure of the parsimony principle that you should not have more variables than is necessary to explain the phenomenon. The actual score holds no significance but a comparison between similar models helps assess if one model is considering more of the available variations than another without adding excessive variables into the model. A lower score is a better score and indicates a better fitting model. Table 1.7.1.2.3 clearly indicates that Model 2, where all five contextual variables were averaged together for the analysis, is the better fitting model.

Model	Time Frame	AIC	BIC
Model 1	0 months	133	171
Model 2	0 months	118	131
Model 2	6 month	105	116
Model 2	12 month	92	103
Table 1.7.1.2.3 AIC BIC statistics of model fit.			

1.7.1.3 Model 3

Model 3 tested an alternative set of explanatory variables that focused more on economic pressures. These variables included the wealth of the country, the amount of money invested in welfare, college education, percentage of female legislators, personal income, and if there was an Eastern vs. Western Europe divide in breastfeeding practices. Using the multinomial regression model there were no statistically significant results. I also tested for levels of association using Kendall's tau-b and Gamma. Table 1.7.1.3.1 outlines the results.

Variable	Time frame	Test	Value	Std. Error	Approx. T.	Approx Sig.
Income Level	0 mon	Kendall's tau-b	0.103	0.163	0.632	0.527
	0 mon	Gamma	0.132	0.201	0.632	0.527
Maternity Investment	0 mon	Kendall's tau-b	0.118	0.142	0.831	0.406
	0 mon	Gamma	0.149	0.178	0.831	0.406
College Degree	0 mon	Kendall's tau-b	-0.188	0.112	-1.681	0.093
	0 mon	Gamma	-0.230	0.138	-1.681	0.093
Women in Office	0 mon	Kendall's tau-b	0.190	0.151	.725	0.469
	0 mon	Gamma	0.144	0.197	.725	0.469
East vs. West	0 mon	Kendall's tau-b	-0.034	0.153	-.224	0.823
	0 mon	Gamma	-0.052	0.233	-.224	0.823
Table 1.7.1.3.1: Level of Association for Model 3, Initial Breastfeeding Rates						

Model 3 was tested against the initial, 6 month and 12 month breastfeeding rates. Hypothesis 9 (initial rates) and hypothesis 11 (12 month rates) were both accepted, indicating that there is NO association between the Model 3 variables and higher breastfeeding rates. Interestingly for hypothesis 10 (6 month rate) there was one variable that was highly significant. The variable on college degree measured, on a scale of 1 to 5, the percentage of women that obtained a college degree. When compared to the 6 month breastfeeding rate there was a negative association between higher education and breastfeeding. This is a somewhat surprising result. Had there been a positive correlation I would have argued that mothers with college degrees would potentially work for companies that might offer more flexible return polices, thus making it easier for them to negotiate both work and breastfeeding responsibilities. They would also likely earn higher incomes and have more resources available to them that would assist in

making it possible to breastfeed longer. The negative association however is puzzling. When the

same model is run as a multinomial regression this same significance level disappears. I do not

feel comfortable accepting or rejecting hypothsis 10 for the 6 month rate at this point and more

research will need to be done in order to determine if there is indeed an effect on breastfeeding at

higher education levels, and determine if that relationship is positive or negative.

Variable	Time frame	Test	Value	Std. Error	Approx. T.	Approx Sig.
College Degree	6 mon	Kendall's tau-b	-0.338	0.104	-3.247	0.001
	6 mon	Gamma	-0.418	0.127	-3.247	0.001
Table 1.7.1.3.2 College Attainment Compared to 6 Month Breastfeeding Rank						

1.7.1.4 Model 4

Model 4 argued that any one variable tested in Model 3 might not have a significant

impact on breastfeeding rates, but that their combined effect might indeed influence

breastfeeding rates. This was similar to the difference between Model 1 and Model 2. I

hypothesized that Model 4 WOULD NOT be associated with higher breastfeeding rates in either

the initial time period (H12), the 6 month rate (H13) or the 12 month rate (H14). Tested as

ordinal levels of association or in the multinomial regression model there was no statistical

significance.

1.7.1.5 Model 5

Model 5 was designed to test for a relationship between level of religiosity or religious

dominance and higher breastfeeding rates for either the initial breastfeeding period, (H15), the 5

month rate (H16), or the 12 month rate (H17). My argument was that there WOULD NOT be a correlation between these variables

Variable	Time frame	Test	Value	Std Error	Approx. T.	Approx Sig.
Religious Dominance	0 mon	Kendall's tab-b	0.128	0.119	1.074	0.283
	0 mon	Gamma	0.162	0.151	.1.074	0.283
Religious Attendance	0 mon	Kendall's tau-b	-0.071	0.138	-.516	0.606
	0 mon	Gamma	-0.089	0.171	-.516	0.606
Table 1.7.1.5 Sample Results From Model 5 Tests Initial Breastfeeding Rate Period						

Model 5 and the three hypothesis tested for this model are therefore accepted. There is not an association between religion--either the presence of a dominant religion or the level of religiosity within the population-- and breastfeeding rates.

1.7.1.6 Summary of Findings

Model 1 demonstrated that while there was not a clear pattern for the effects of each contextual variable on higher breastfeeding rates there were three factors that were more highly associated with at least higher initial breastfeeding rates; Social Acceptance, Resource Commitment and Advertising Control. Model 2, testing for the combined effects, revealed that in the 0 and 6 month breastfeeding rate there is a high level of association between higher average score and higher breastfeeding rates, and at the 12 month level the worst average performers also had the worst breastfeeding rates. For the 12 month rate it should be noted that because the initial 12 month rates were so low to begin with that the fact that they are at least higher (even though inconsistent at this point) may be indicative of a relationship that might just need more time to stabilize and that additional longitudinal data might indeed confirm that a relationship does exist.

Simply put, more time and data is needed to ascertain the true level of association for the 12 month rate period but at this time there is no statistical association between the higher level of breastfeeding support and 12 month breastfeeding rates. Models 3 and 4, testing for alternative explanations to the higher breastfeeding rates, returned no significant correlations with the possible exception that higher levels of college degree attainment among women might be associated with a reduced 6 month breastfeeding rate. Finally, there was no association between the two religion variables tested in Model 5 and higher breastfeeding rates.

Based on the level of association and the model fit statistics the best model for predicting higher breastfeeding rates is Model 2 which combines the effects of the five contextual variables (social acceptance, resource commitment, legal protection, united voice and advertising controls).

### 1.8 An Exploration of Alternative Explanations.

While the results from section 1.7 indicate a very clear pattern of association at the initial breastfeeding rate levels, that level of association begins to breakdown at the 6 month breastfeeding level and is almost completely gone at the 12 month mark. This is a significant challenge to my overall thesis which was that the five contextual variables would have the greatest impact on long term breastfeeding rates. To assess the model's weaknesses, let's explore where the 5 Policy Average Model model does not work by country and variable and interrogate the data to discover if there is are other possible explanations for long term breastfeeding success than the five contextual factors proposed in my model. Perhaps we'll discover some confounding variables or reasonable explanations for why the model did not work as smoothly as postulated for the longer term rates, and especially the 12 month timeframe.

To find the outliers, I subtracted the predicted score (based on the average score of the five contextual variables) from the real breastfeeding rank at 6 months and 12 months. The range of discrepancy was between one and three. I considered those countries that were at least 2 or 3 positions removed from their predicted rates as outliers (in either the 6 month, 12 month categories, or in both). For instance, Croatia has invested significantly into their maternal resource allocation, and they have shored up the legal protection of breastfeeding women. Also, the social acceptance of breastfeeding was high. However their scores in the united voice and advertising control variables were only average. Their overall average score was a 4 on implementation. This conforms well to the model for the initial breastfeeding rate period, but their six month breastfeeding rates where among the worst with a score of two, and the 12 month rate scored only a 1. This is a difference of two and three respectively. Croatia would thus be considered an outlier because my model would have predicted a significantly higher rate of breastfeeding for the 6 and 12 month periods than is actually observed. There are seven nations that I am considering as outliers; Croatia, The Netherlands, Poland, Belgium, Spain, Lithuania and Latvia. Each exhbits a similar patern noted above for Croatia.

It is important to note that these extreme outliers only appear when 2 or more of the five contextual variables performed poorly vis a vis the score for the contextual variables. If a country were to perform every well in 2-3 areas (social acceptance, resource commitment, legal protection, united voice and advertising control), but then fail to implement equally strong polices in the remaining 2-3 areas, there appears to be a potential interaction effect where the lower score in those 2-3 areas has a greater impact on the breastfeeding outcome then my simple additive model accounts for. This is an important finding that I will need to explore more in future research.

Extreme Outliers:
Degree of Deviation From Model

Range

Extreme_Ou

0 Deviation

1-2 points

3 Points

0   485   970   1,940 Miles

Map 1.8
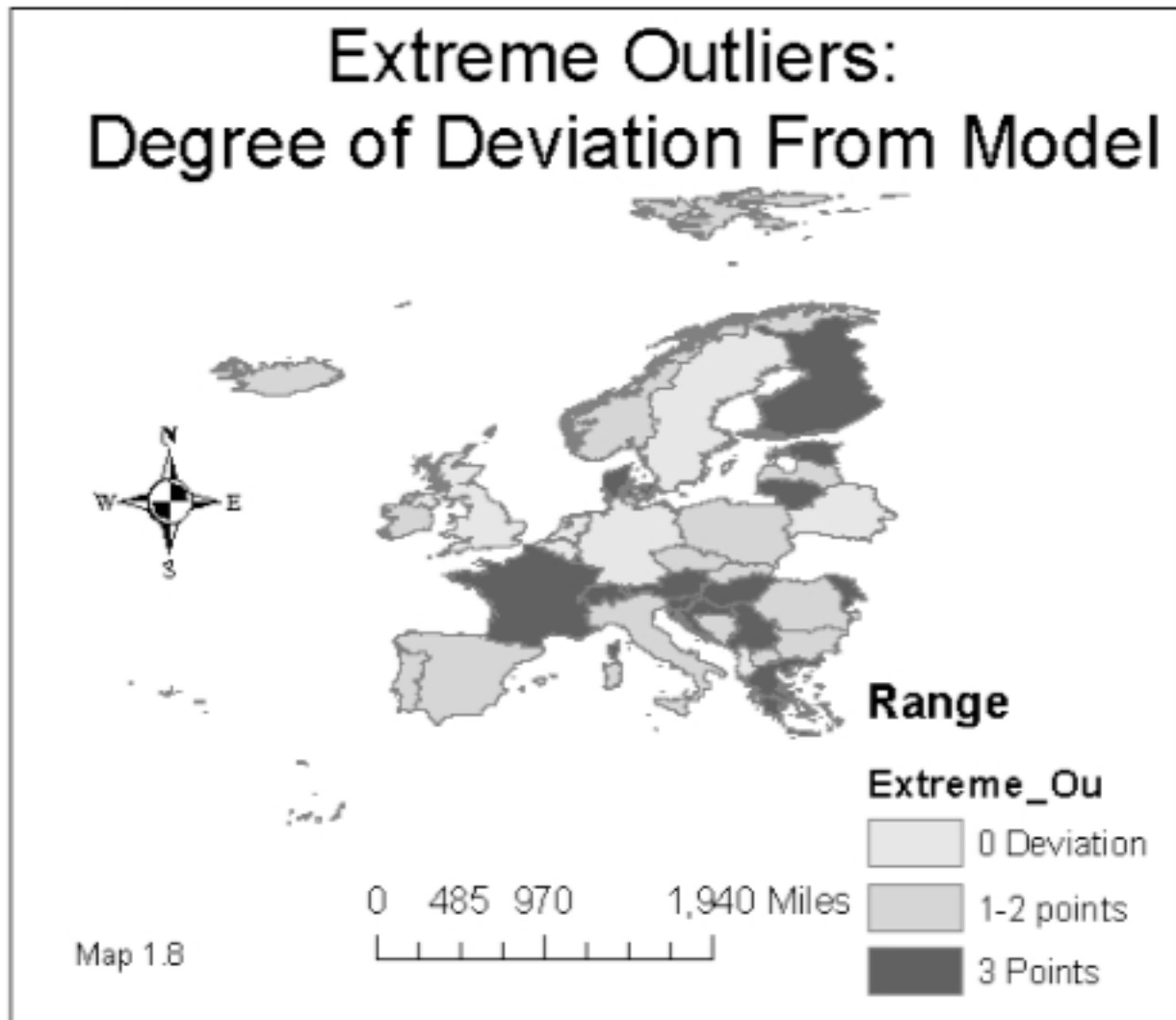
1.8.1 An investigation Into Croatia's Outlier Status

One major contributor is likely the maternity leave policy. As of 2003, Croatian maternity leave was 6 months. This is the minimum to qualify as a rank of 4. While the government mandates significant time off - 2 hours a day and the mother is still considered full-time - to accommodate breastfeeding mothers, it is apparently not enough to overcome the move away from breastfeeding (United Nations, CEDAW Croatia 2003, 40). In order for the Croat

plan to work, mothers would need to have easy access to early child care services but there are significant impediments to effectiveness of this plan. The main prohibition is the changing nature of child care. In the past, families were more inter-generational and younger families could rely on grandparents to help watch children. Over the last decade this has begun to change and new couples are pushing to have their own space now more than ever before. With the move away from family, lack of government sponsored or subsidized child care, and lower income levels, child care While this is not an abnormal development, it is happening more recently than for many other European countries. Being in a transition period may adversely effect Croatian breastfeeding rates, and given enough time they may normalize on their own similar to other countries with comparable high levels of resource commitment.

Another factor that may affect a mother's use of the 2x/1 hour breaks may be the societal perception of what is appropriate to take time off for at work. Croatia was in the middle of the pack on income disparity, which may suggest that if a mother wants to be taken seriously at work she may not have the luxury of taking additional leave time for breastfeeding. While this is also not abnormal, the 2003 CEDAW report suggest that because of the more recent implementation of the breastfeeding break law and the lower levels of affordable childcare near where the mothers work, not enough time may not have passed for the affects of the policy to begin reveling themselves in the 6 and 12 month data. Additional research would need to be conducted in order to determine this connection with any finality, but one could certainly envisage a link between the two, and if improvement is being made that is not captured in the data as presently constituted.

Timing of the data plays a key role in the next factor was well. In the late 1990's there was not a united voice on breastfeeding, and formula companies were passing on erroneous

information such as breastfeeding should be started several days after birth or that babies needed additional supplements to keep them hydrated (Robertson 1998). Since the 1990's, the Baby Friendly Hospital Initiative has helped increase initial breastfeeding rates in Croatia (Bosnjak 2004), but these initial increases have been countered by increased advertising campaigns by formula companies outside of hospitals and the use of "supplemental" baby drinks are actually increasing at a rate of .8% per year (Datamonitor 2009). In 2006 all Croatian hospitals technically became certified as Baby Friendly Hospitals under UNICEF's direction (UNICEF Sept 16, 2008). As of 2006 Croatia was reviewing additional legal action to further ban formula advertisements (IBFAN 2006, 3). It was unclear if the additional bans were finally passed into law. All of these factors combine to make Croatia at best a late adopter and at worst in possible need of stricter laws.

Only one other country in the database has a high initial rate of breastfeeding that plummets at the 6 and 12 month range and also has 6-9 month maternity leave policy, and a recently tightened formula law - the Czech Republic. The Czech Republic offers 7 months of maternal leave and the breastfeeding rate at 6 months is the same (38%). But the 12 month rate is significantly differently at 19% for the Czechs vs. 3% for the Croats. Because the Czech Republic only offers 7 months of maternity benefits, the fact that 19% of mothers are still breastfeeding five months after the maternity coverage has finished suggests that maternity leave policies are likely not the major contributor to the 19% figure, but that the Czech Republic's high score on media control might play a role in these higher breastfeeding rates even though the country cannot/does not want to invest more resources.

The Croatia pattern suggests that a few caveats are in order. First, if you want to increase breastfeeding rates, you will need to invest in a maternity leave that is longer than the desired

breastfeeding period, provide easily accessible child care facilities, and/or severely restrict formula advertisements. While each of these policies in isolation may increase the rates of breastfeeding, any one of them appears to be insufficient to bring the rates into compliance with medical standards. While Croatia does not completely conform to the model's predictive design, its pattern does not refute the model so much as it requires the model be more sensitive to a time element (from the time a policy is enacted until the benefits are demonstrated), points to the need for a more refined maternity benefit scale to account for countries that barely pass the thresholds, and/or a need to account for a weaning period.

1.8.2 Netherlands

Breastfeeding rates in the Netherlands are not high in the newborn period. Initial breastfeeding rates are at approximately 75%. This is not a particularly strong position from which to start. Comparatively, those countries with low initial breastfeeding rates tended to perform quite poorly vis-a-vis higher initial rate countries in the 6 month range. This same relationship is not as clear for the 12 month range because of the lack of longitudinal data at this point in time and the need for more time to lapse in which to gather significant data. While it is not clear what influences the low initial breastfeeding pattern in the Netherlands, there are some factors that we should expect will affect the long term rates.

First, the Dutch maternity leave disappears at 4 months (Social Security Administration 2007, Netherlands). With the maternity leave benefits ending before the 6 month mark it is not surprising, based on that fact alone, that the 6 month breastfeeding rate would be low compared to other countries with better maternal leave policies. What is surprising is the effect this might have on income discrepancy. Technically the number of children a woman has, and the amount

of time she has to take off for those children (among many other factors), will contribute to higher income discrepancies between women and men. In the Netherlands women have on average only 1 child and with only a 4 month maternal leave package they are potentially not removed from the labor force for very long. Despite that seemingly small time frame, the income disparity between men and women is between 17% (Esr 2009, para 1-2,) and 21% (Willman-Navarro 2006, 13), and according to the UN Observation committee, it is not improving (UN CEDAW: Concluding Observations 2007, 6). A 20% income discrepancy score is about middle of the road for a European country. Statistically there was no association in the overall sample of European nations between better breastfeeding policies and LOWER income discrepancy - but examples like the Netherlands migh allude to this possibility in certain contexts. In my model I only wanted to ensure that active promotion of breastfeeding was not associated with poor income discrepancy scores, but it is also possible that given more time and a longitudinal study we might actually discover that better breastfeeding policies actually improve income discrepancy scores.

The Netherlands also presents one other major difficulty for women and breastfeeding that might contribute to the lower longer term rates as well as the economic insecurity. Legally, women are made somewhat more vulnerable because breastfeeding in public is not protected under all conditions and this can impact both public breastfeeding and breastfeeding while at work. Further research is needed to determine the degree to which either of these issues directly relate to lower long term breastfeeding rates in the Netherlands. The Netherlands, like Croatia, also appears to exhibit the same phenomenon where 2 or more variables that perform lower than the rest seem to have a larger impact on the long term outcomes of breastfeeding.

1.8.3 Poland

Poland is an example of a deviation in the opposite direction. Poland's initial breastfeeding rates are in the top category but their policy positions would not have predicted this. Legally Poland is one of the worst countries in terms of protecting women's rights to BF and it is mediocre in all other categories except formula advertisements, where it is in the top category. Why is it then that Poland's initial rates are so high even though the environment would not normally be seen as conducive to breastfeeding? Based on this dataset one might surmise that because of its religious population (second highest religious attendance) and lower female employment rate at 47.6% of the female population (UN, Economic and Social Council, 2007, 14-15), these factors might combine to create a more conservative nation that despite poor support might have at least higher initial rates.

Because Poland's overall score is low, we would have expected the 6 month and 12 month scores to be low as well. In this respect they conform to my proposed model. However, the exceptionally poor performance at the six month mark may be due to data error more than model error. The only rate that I could find for the 6 month breastfeeding score was not much different from the 12 month rate. Based on the results for the other countries, the 6 month rates were normally 2-3 times the 12 month rate. This makes Poland's 6 month number very questionable.   The collection of more accurate data on the 6 month mark from a few other resources would help triangulated a more accurate 6 month score. If we were to just consider the average of 2-3 times the 12 month rate then the 6 month scores would have also been much higher than the predicted score. Further research needs to be conducted to determine the correct rate and then reassess if the rate is actually higher than would be expected.

Even if the 6 month rates does not change it appears from the data the main driving influence behind Poland's rates are neither policy (from Models 1 and 2) nor economics (from Models 3 and 4), but may be influenced by the religion variables measured in Model 5. This policy may help keep rates relatively high in the short term but is not likely to be a policy that Poland can rely on to keep their breastfeeding rates high because overall religiosity scores continue to drop in Europe. In order to counteract these pressures, I would argue on the basis of my empirical results that Poland will have to adjust their laws to address the legal vulnerability of women, conduct public awareness campaigns to push the acceptance of public breastfeeding, and will certainly need to increase their resource commitment to ensure that women can stay home longer than the current four months would allow.

Currently, religious convictions are not enough to raise the breastfeeding rates in Poland to acceptable levels. Their initial breastfeeding rate is just over 90% and their 12 month rate is just under 20%, with a 6 month predicted score of 40-60%. These 6 and 12 month scores are far below the ideal. And while they may currently be in line with the rest of Europe it is likely that the policies implemented in other countries will continue raise rates elsewhere while the reliance on religious observance will likely continue to decline in Poland and with it the breastfeeding rates. Because my scale is not based on absolute numbers but on relative positions, I predict that Poland will continue to decline in its breastfeeding scores vis a vis the European nations that implement the fully described breastfeeding programs.

1.8.4 Belgium

Unlike the countries we have looked at so far, Belgium does have progressive legal protections in place for women and public breastfeeding appears to be socially acceptable. There

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are three areas where Belgium falls short, which may contribute to its poor performance in the longer term breastfeeding rates. First, while there may be social acceptance of breastfeeding in public, the initial rates of breastfeeding at 67% are in the lowest scoring category. As we have noted this is a confounding factor in the longer term rates. Belgium would have the added responsibility of increasing its public perception of breastfeeding to increase the initial numbers. The next item may help address this.

Belgian officials do not appear to operate with a clear voice supporting breastfeeding, and combined with lax advertising laws for formula companies, this may create a scenario that pushes women away from breastfeeding. While it is not clear if a more unified voice and strengthening the formula laws would address the public perception of breastfeeding noted above, it is likely to help. Regardless of the benefits in the short term there appears to be a long term benefit to these policies based on the overall empirical analysis and Belgium would need to address these areas anyway to follow a more effective policy course. They may find that these changes would be enough to improve the initial rates as well.

The third weak area is resource commitment. Belgium barely qualifies as a 3 because they cover less that 4 months maternity and the majority of it is only at 75% of the earned income. Even if the initial rates increased substantially, Belgium would likely find that their 6 month rates would not improve substantially because of the 4 month benefit ceiling. Evidence from the data suggests that there is only one condition under which a country will have average resource commitment and still have higher than average 6 or 12 month rates. Only four countries demonstrated this pattern: Albania, Romania, Bosnia and Belarus. Each has under 50% female employment, each is a former Russian Federation, and each a former Eastern Bloc Nation. It is only under these conditions that we see evidence that a country can underfund maternity and

breastfeeding programs and still achieve higher-than-average breastfeeding rates. The possible

explanation for why it works in these four countries is because they happen to be too poor for the

moment to buy formula. As incomes rise something would need to change to ensure that the

pressure to use formula is not stronger than the pressure and incentive to breastfeed. Clearly this

is not a sustainable pattern for even these four countries, and certainly not a viable option for

Belgium.

Fortunately Belgium does not have as large a concern with income discrepancy between

men and women. They scored a 5 on that scale, and while there is still improvement that can be

made. the government should be congratulated on their achievement and encouraged to improve

by further decreasing the vulnerability of their mothers in the work force.

1.8.5 Spain

Spain begins with a respectable 91% breastfeeding rate at birth. That quickly drops to

around 20% for the 6 and 12 month rates. Spain is not a poor performer in any one category -

they simply do not excel in any category.

It is interesting to note that the 6 month and 12 month rates are very stable. Only Poland

showed that kind of consistency and it is possible that this, too, is a data artifact. The data for

Spain, for the 6 and 12 month rates, was collected from different sources and there was only one

source for each time period. If the 6 month rate proved to be higher in reality than I have

recorded then Spain would no longer be an anomaly since only its 6 month rate pushed it into

this category.

Another possible explanation is that religion may be a better explanatory variable. If we

consider the three countries that start the highest on initial breastfeeding (Spain, Poland and

Croatia all begin above 90%) and then perform the poorest in the six and twelve month rates we discover that they all hold a particular pattern. The one obvious variable common between all three is that they all scored relatively high on the religious attendance measures. While religion did not have a statistically significant effect on the whole sample it appears to be a contributing factor in the outcome of these three countries. Perhaps what we see is cultural pressure to breastfeed and perform more traditional roles and then, depending on the labor rate for women, their continuation of breastfeeding is dependent on the resource commitment. These three countries are hardly the only three Roman Catholic countries. What is it about these three that would make religion a factor when it is not in the others? There are four possibilities. First, there are a group of countries with lower levels of Catholic identification and very low levels of actual attendance. These include the Netherlands, Switzerland, and the Czech Republic. It is not a stretch to say that with such lower numbers of Catholics, and lower levels of attendance, the influence of the Vatican on the country at large will be small. The second group are those with higher levels of self identified Catholics but also lower levels of attendance. These include Belgium, Belarus, Lithuania and Luxumborg. The reasoning is the same here. Lower attendance would likely equate to lower level of implementation of Vatican policies.

The third group are those with mid level Catholic identification and also relgiosity. These counties include Austria, France, Slovakia, Slovenia, Hungary and Croatia. This is where the first problem comes in with ascribing religion as an explanatory variable for these initial three countries. If Croatia were not in this group one could argue that it requires a high level of religious concentration and a high level of religiosity. There are two other factors that might make a difference here. First is the level of workforce participation. While not significant, women in Croatia work at lower levels than any of these other countries (2-9%). It is possible

that women having children may move out of the labor force more in Croatia than in these other countries, thereby giving them a higher chance to live their religious beliefs more easily. The other major difference is in unemployment. The unemployment rate in Croatia, at 17%, is 70% higher than the next closest country Slovakia (10%). And whereas the unemployment rates in the other countries are roughly equal for men and women, over 65% of Croatia's unemployed are women. This may also contribute to more women being more "available" to breastfeed (and more in need of breatfeeding because they are poor).

The fourth group are those with high concentration and higher levels of religiosity. These include Ireland, Italy, Portugal, Poland and Spain. Are there any differences between Poland and Spain and the other three countries in this same category? The first difference may simply be in the implementation of the overall policy score. Ireland and Italy are among the worst performers with an average policy score of 2 (compared to the others with a score of 3). It may be that these two countries perform so poorly on the implementation score that even pressure from a religion is not enough to overcome it. Portugal, while slightly lower in the level of concentration and religiosity compared to Spain and Portugal (5% less concentration and a religiosity score 4 instead of a 5), is not so different. But when you combined these lower levels in the religious scores, with a female employment rate about 10 percentage points higher than either Spain or Poland, it may be more than enough to explain the difference. Determining the exact difference at this point is beyond the scope of this thesis. With 3 of the 4 highly religious and highly concentrated Catholic counties showing higher rates of breastfeeding, and enough reasonable explanations to distinguish these countries from the other Catholic countries, it may reasonable to conclude that there are at least some circumstances where religion will make a difference, although a declining one, in the breastfeeding rate.

As with Poland above, Spain cannot rely on this pattern into the future nor can it rely on it to help increase breastfeeding rates. According to my analysis, the best it could hope for in the short term would be stable rates but these would be significantly lower than the breastfeeding standard scores that are recommended by all pediatric agencies.

1.8.6 Lithuania

That Lithuania was a poor performer is not a surprise. While it did have one bright spot with legal protection of breastfeeding, all other indicators were only average and its social acceptance was near the bottom. This is not the only former Soviet satellite to score very low on social acceptance of public breastfeeding. In fact almost half of all the former Soviet republics had lower than average scores. While the Soviets did have a generally pro-breastfeeding policy, there is also some anecdotal evidence that it was not socially acceptable so much as it was legally permissible. A study in Canada found that immigrants from former Russian satellites struggled with a desire to breastfeed and cited pressure from Russian ideology to commit more to work than breastfeeding. (Canadian Government 1997, 24 and 007b.com "other people's comments" para 105). Affirming this theory is the fact that Lithuania (along with Estonia and Latvia) have the highest Russian ethnic presence to this day of all the European countries that were formerly under Russian control.

When comparing legal acceptance vs public acceptance Lithuania tied with the Czech Republic for the highest discrepancy between the two scores. The Czech Republic, however, has a very high initial rate of 92% and is performing better in the 6 and 12 month categories than in the past based on the limited longitudinal data available. What was the difference between the two countries? In 1997 the Czech Republic has bolstered its resource commitment (Social

Security Administration Czech Republic page) and prior to 2000 revised its laws regarding formula marketing beginning prior to 2000 (Mydlilova et. al. 2009) and more aggressively prosecuted violeations at least since 2004 (Baby Milk Action 2004, 2). These two changes appear to have been significant enough to overcome the cultural taboo on public breastfeeding and the Czech Republic's 6 and 12 month rates are nearly triple that of Lithuania.

While the "Russian explanation" is not a statistically significant factor generally, as it was tested in Model 3 and 4 and found wanting, it may be that, like religion for Spain and Poland, the former Soviet bloc countries may have some cultural baggage that must be addressed with additional resources and commitments from the current government in order to overcome historical cultural pressures on the current population. This discovery requires additional research to establish a link between former Soviet satellite breastfeeding policies and lower breastfeeding rates as well as a potential modification of Model 1 in order to accommodate conditions under which former dependency may matter.

1.8.7 Latvia

Latvia has the dubious honor of being the nation with the lowest breastfeeding initiation score in my sample, and a low resource commitment to maternity--one of the lowest in all of Europe. With the highest percentage of Russians in their population and approximately 60% of women actively employed, there is an enormous social pressure to not breastfeed at all or for very long. Even though Latvian authorities have done a commendable job passing laws to protect women and speaking in a united voice on the benefits of breastfeeding, it is apparent that the other social pressures, combined with some of the most lax laws on formula marketing in hospitals in Europe, have conspired to produce the worst breastfeeding rates in Europe.

The initial breastfeeding rates may be a critical factor in the longer term breastfeeding performance. In order to understand the strength of the initial breastfeeding rate's affect on the 6 and 12 month scores I reran the multivariate analysis with the initial breastfeeding rates averaged into Model 1 with the 5 contextual factors. I then regressed this against the 6 and 12 month rates and produced the following significance values.

Score Level	6 months	12 months
1	base	base
2	0.015	0.024
3	0.132	0.023
4	0.020	0.122
5	0.030	error
Table 1.8.7 Revised Model 1 for 6 and 12 month Significance Scores		

There is a strong association at the 6 month level in all but one score level. The 12 month relationship is only significant in the lower range. Initially this appears to be odd. Why would higher starting rates make a difference in the 6 month range and not the 12 month range? Recall that first, the 6 and 12 month rates are based on the data range not on an ideal level of breastfeeding. Second, the 6 month rates are influenced by strong breastfeeding policies, in particular a higher resource commitment level score. That commitment level drops in even the best countries after 9-12 months and with that change, the breastfeeding rates plummet at the 12 month level. At the same time, some of the more conservative and traditional countries that do not have long term breastfeeding supports in place, but have a strong tradition of breastfeeding, begin to skew the 12 month rate results on the high end of the score levels of 4 and 5. This explains why there may be a correlation in the lower levels of breastfeeding rates (those with maternity or other supports do have lower breastfeeding level scores), but on the high end of the

12 month level there is no statistical significance, because of the mix of countries that have supports and those that do not have supports but still currently achieve similar breastfeeding score levels.

It may also be important to just allow more time for the policies in place to take effect. There are four countries that had average breastfeeding implementation scores of 3, but were lower performers on all three breastfeeding periods. The four low-performers are Latvia - 33%, Belgium - 67%, Lithuania - 75%, and the Netherland - 75% (in the initial breastfeeding rate period). Some may argue that doing more is not necessary and that if enough time were to pass the rates would eventually rise to more acceptable levels. Assessing how long a program must be implemented before we see its effectiveness is beyond the scope of this thesis, but considering that each of the program has been implemented for at least 10 years, it would seem to me that enough time has passed to at least see more improvement than is visible now (Latvia 1995, Belgium - 1994, Lithuania - 2000, and the Netherlands - 1998). But a longitudinal study would need to be performed in order to truly make this assessment.

While it may not be clear if an average policy implementation will, over time, eventually raise the breastfeeding rates, it is without question that millions of babies are going without the added benefits of breastfeeding while the social experiment takes place. It may behoove these poorer average performers to implement more full scale policies in order to hurry the progress along. Countries with extremely low initial rates should also consider implementing polices that other nations have reserved for the later push toward 100%. Norway, starting in the 50% range, mandated all five policy variables to push the country to 90%. Like other top performing countries, Norway then added home lactation specialists, follow-up visits, spousal support in the form of mandatory paternal leave and maternal leave sharing in order to push from the 90%

range to near 100%. For these countries that are starting against such great odds, additional measures may need to be taken at the beginning in order to create enough momentum to break decades of traditions against breastfeeding. While there are no examples of countries that have gone that particular route to date, it makes intuitive sense that adding those programs now may help in two critical areas for these countries. First, social acceptance would likely improve with the additional intervention programs and second, additional commitment of social resources will also be needed; therefore, by definition, the societal investment into breastfeeding will also increase. This linkage would need to be tested more thoroughly for theoretical logic but it may prove an effective strategy. Countries like Norway have already tried the incremental approach to achieve compliance with the international standards for the 0, 6 and 12 month periods. Countries with lower performance would be well advised to not delay a much fuller implementation as no country has obtain the health profession's recommended ideal without all of these programs in place.

1.8.8 Six Month Over-Achievers

There were also several countries that scored above the predicted values for the 6-month rate. This list includes Switzerland, Serbia, Germany, Albania, Bulgaria and Denmark. These countries should be examined to determine if there were factors common between them that would either confirm or refute any of the three models. These countries scored one level above what the model would have predicted for the 6 month rate.

Regardless of the alternative variables examined, from income to female politicians, there is a significant difference between each country with no clear explanation for why they would score higher than predicted. It is certainly possible that there are other variables not accessed in

my general models that might account for the increase. It is also possible that the increase is insignificant. Consider that while all five scored above average on the 6 month rate they were below the predicted values for the 0 and 12 month rates. What significance could this have for our data? First, it may mean nothing at all and may simply be an interesting coincidence. It is also plausible that perhaps polices that were put into place allowed mothers who intended to breastfeed their children to do so from the beginning until they decided to quit, meaning that the policies were not effective at convincing mothers to adopt breastfeeding from the outset, but for those women who already intended on breastfeeding for 6 months the policies were effective at helping them stick to the goal. Furthermore, none of these countries were over performers in the twelve month category. There may be additional explanations that need to be explored in future research to determine the strength of policies and their effect on the corresponding breastfeeding rates to account for why policies effective at the 6 month range would not be effective at 12 months.

1.8.9 12 Month Over-Achiever

Only Romania scored higher than its predicted value in the 12 month range. Breastfeeding at the 6 month range is just slightly above average at 57%. What is remarkable is that 70% of those breastfeeding at 6 months were still doing so at 12 moths. That is a phenomenal retention rate. Is there something Romania did differently than the rest that allowed for so many of them to continue out to 12 months?

The only thing that outstanding in Romania's variables are its score of level 5 on the media laws. That was high compared to the other factors for Romania but hardly high for the complete dataset. What else might be contributing to the higher than average long term breastfeeding rates? Baby Milk Action website reports that as of 2001 Romania was one of the

initial adopters of laws that would regulate the media surrounding breast-milk substitutes. While firm numbers are not available on exactly when breastfeeding rates in Romania begane to rise, and thus we cannot tell if the long term rates increased after the media regulation was put into place, it is apparent that there may be a correlation between the presence of high media regulation, early adoption of said policies (or patience as these policies are implemented), and high 12 month breastfeeding rates.

One must also consider that like the 6 month rates, it is just a statistical artifact. Recall that the scales are five points and that the upper and lower range of the 5 point scale are based on the range of the actual data, not the ideal level of breastfeeding prescribed by organizations like WHO and UNICEF. While Romania's 12 month rate of 57% is commendable if it were compared to the ideal, 57% would be very poor performance indeed. The relative measures of the scale indicate that it is doing well now but if further changes are not implemented it could find itself falling behind in the rankings as others improved. Romania would be well advised to adjust its policies (currently their score is just average at 3) and build on the foundation they have created until they have achieved the recommend breastfeeding levels. If they do not they will likely see a drop in their relative ranking performance in the future.

Section 1.9 Conclusions

From the outset my intention was to demonstrate what factors and conditions would constitute an effective breastfeeding program in Europe. The goal was to find legal and contextual factors that would influence how women viewed and navigated the public and private spaces of their lives and as an end result allow women to breastfeed at increasingly higher rates over longer periods of time. The corollary to the increasing breastfeeding rates was that it would

be important that the increase not disadvantage women and put them at greater economic risk than they already suffered.

Based on those goals, there several conclusions that can be drawn from the foregoing analysis. First, I accept Model 2 as the model with the strongest association between the dependent and independent variables for Europe. In this case these independent variables consist of five contextual policy and legal factors including social acceptance of public breastfeeding, social investment in maternity leave, legal commitments to protect lactating mothers, a united official voice promoting breastfeeding, and strict controls on formula advertisements. Based on the analysis, these five factors did show some significance level as individual variables, but they were far more powerful when averaged together as a complete policy. This would indicate that breastfeeding policies need to be more holistic in nature because breastfeeding levels are affected by complex sets of circumstances that one policy alone, or even multiple policies with mediocre implementation, cannot fix on their own. While scores in these five areas demonstrated significant correlation at the 0 and 6 month levels there was still room for improvement in creating a model that most accurately reflected the data in the 12 month category in particular.

My results suggest the the initial breastfeeding rates do matter. If you want to have high long term rates is it important to engage the public and the mother directly in order to encourage them, and support them, to begin breastfeeding. This is not a simple task but the Baby Friendly Hospital Initiative would be a great start, for it would mandate two major improvements for most countries. First, it would restrict formula companies from advertising in hospitals completely. As was demonstrated in the analysis section, there is an extremely high correlation between formula advertisement control and initial breastfeeding rates. Second, it would require hospitals to train

their staff in breastfeeding techniques so there are more, and better qualified, breastfeeding support staff on hand to encourage and support the new mother in her efforts to breastfeed.

Second, while restricted advertising certainly makes a difference in the short term it is not significant enough to alone overcome a severe lack in the other four factors. A perfect score in the advertising section may be able to overcome a level 4 investment into maternity benefits, but media control by itself cannot promote higher breastfeeding rates when the social investment is only a 1 or 2. In fact there is no one variable that can overcome the effects of one really poor performer, or two or more mediocre performers.

Third, it may in fact be necessary to over-compensate in some policies in order to achieve the desired ends. If the main goal is to have the vast majority of women still breastfeeding their children at 12 months of age, it would not work to have a maternity policy that terminates at 12 months (the longest currently implemented) because of weaning considerations. Unlike the other 4 contextual variables (social acceptance, legal protections, united voice and advertising controls), the resource commitment score is much more sensitive in the model. Only one country (Hungary) scored higher in the long term breatfeeding categories than its resource commitment score would have indicated. While resource commitment alone does not predict higher breastfeeding rates in the long term, it's score does generally indicate the upper bound for those long term rates.

Fourth, while the legal score and the united voice score certainly contribute to success of the overall program, they do appear to be less important as long as there are strong acceptance, resource commitments, and advertising controls in place. The multivaritate analysis did not reveal that they were significant in their own right and the correlation analysis showed that the correlation was less strongly associated to breastfeeding rates especially at the 6 and 12 month

period. This does not mean, however, that they should be rejected from the model. Because Model 2 was a better predictive model (combined highest average), the effect of these two variables on the average needs to be considered. In exactly 50% of the cases these two categories made no difference to the overall score. However, in the other half, the combination of the two pushed the overall score higher into the 4 and 5 categories. It is also likely that these two variables are precursors to success in the other three categories. Out of the 36 cases, there were only 5 where the other three variables outpaced the legal and united voice variables. So while they may not contribute as directly to the overall breastfeeding scores they do appear to be quite important to the overarching processes of increasing breastfeeding rates. Perhaps in a future model I will need to consider placing a smaller weight on these two variables and placing a greater emphasis on what appear to be the three main variables - public acceptance, resource commitment, and advertising control. More research needs to be done to establish the linkage between the legal and united voice variables and how they contribute to public discourse that might affect the other three variables.

Fifth, it is evident from the statistical analysis outlined in section 1.8 on the outliers that the initial breastfeeding rates had a profound impact on at least the 6 month breastfeeding rates. Significantly more research needs to be done to understand why the 6 month breastfeeding rates are so low in certain countries. While this thesis has explored superficially one possibility (the Soviet Bloc connection), there are others that remain unexplored in this thesis. At minimum, these include the following: the continuing influence of Victorianism, class distinctions and perceptions, concepts of gender roles, the specific brand of the feminist movement that resonated with the women, and perceived or real punishments in the workforce for breastfeeding. It will be important to understand the impact of these other factors on the development of the breastfeeding

paradigm in the country in order to determine which factors and policies might help a nation undo past damage and move forward as rapidly as possible.

Sixth, based on the analysis of the outliers, there are several conditions that some countries may need to consider adding to the five principle factors in order to see the effects of the policies take hold in a shorter period of time. These include adding daycare and early education programs into the maternal leave policies and increasing the paid maternal leave program 15 months to account for the weaning period.

Seventh, future models will also need to consider the interaction effect between the five contextual and policy factors. There appears to be an especially negative effect on breastfeeding rates if 2 or more of the five factors are 2 or more levels lower than the other factors. Even if a country is doing well in the other 3 areas, if they are a poor performer in at least 2 categories then their breastfeeding rates will be lower than their program would otherwise have predicted.

Eighth, there are several countries where religion appears to currently have a positive impact on at least the initial breastfeeding rates. These countries (Poland, Spain and Croatia) should be cautioned to not rely on religious traditions to maintain their current breastfeeding levels. Not only do their breastfeeding levels not match the recommended ideals, they also risk dropping even further from the goals as more women enter into the workforce and religiosity wanes in Europe. The policies outlined in my model will build on their current foundation and make achieving the goal of higher long term breastfeeding rates more possible by preemptively adjusting policies before the real crisis hits.

Ninth, future analysis will need to focus on longitudinal studies to determine over time which policies have the greatest impact and to what degree they impact the breastfeeding rates.

The model could also be expanded and tested with additional countries and cultures to determine if this is a more generalizable model, or one that will only work in European/Western societies.

Tenth, while stated previously it should be reiterated that there was no statistical connection between the number of female politicians and higher breastfeeding rates. More research will need to be conducted to determin the reason for this apparent lack of association.

Finally, perhaps the most significant finding in this thesis is that there is no relationship between breastfeeding advocacy and increased economic vulnerability of women. This is a critical piece of data from a feminist perspective. It is apparent that the laws and social structures that govern public perceptions of the public and private space are sufficient enough to protect women while at the same time increasing the breastfeeding rates in many countries. Even more important is the discovery that there may even be a connection between increasing policies that support breastfeeding and decreasing economic vulnerability of women. This discovery needs to be explored more carefully to determine the causal mechanism and order. Did the breastfeeding policies happen first and thus positively influence the income discrepancy, or was it the opposite? From the current dataset it is not possible to determine the direction of the causal arrow, but the fact that there is not an association between increased breastfeeding rates and increased income discrepancy is an important finding on its own.

This thesis has sought to understand the navigation of the public and private space through the lens of breastfeeding in Europe at a macro level analysis. This, however, is not the only level of analysis, nor the only type of data, that might help us understand how to positively influence breastfeeding rates. On a macro level it may be important to also look at the availability of child care services and/or work center daycare requirements. On a more micro-level of analysis, one could consider the role of programs such as in-home lactation specialists,

or the strictness of perceived gender roles, spousal support of breastfeeding, and in-home responsibilities.

By adding further refinements to the proposed model, and by pursuing additional research in the areas outlined above, it will be possible to gain an even more complete understanding of the impact of these factors and broaden the generalizability to more regions. While the model can continue to be refined, this research has contributed to our further understanding of processes surrounding breastfeeding and cast light on additional avenues for future research.

As outlined in the beginning, I set out to demonstrate the explanatory power of five contextual factors and policies to allow mothers greater ability to navigate from private space more freely into public space, and hypothesized that by increasing a country's position on these five contextual factors that two main correlations would be observed. The first correlation posited is that countries with the higher average implementation on the five variables would indeed have higher rates of breastfeeding at birth, at 6 months and at 12 months. This position has been affirmed with a degree of certainty through statistical analysis. There was little effect on the 12 month rates, but the initial and 6 month periods were strongly related to a higher average over the five variables. The second main purposes was to show that implementing these policies that allow women to more easily combine the public and private spaces would at least not have a negative impact on wage discrepancy scores and hence not contribute to the economic vulnerability of women. This has been affirmed in the data and there is even some evidence in countries, like the Netherlands, that fully implementing breastfeeding support policies and conditions might even help reduce income inequality. The positive convergence of the public and

private space is essential to the success of these policies, the effects on the mothers who

breastfeed, and the children they are raising.

The following variables were use from the WomanStats database to create the scales use in this thesis.

AFE PRACTICE 3: According to societal attitudes, what is the ideal level of education for a man and for a woman? [e.g., *World Values Survey #226]* Compare this with actual rates to take into account cultural attitudes towards education. (E.g., , if the actual rates of education for everyone are no higher than a 5th grade level, it may not be a reflection of gender bias if women only have a 5th grade education.]

AFE DATA 1: What is the percentage of females going to school? (This will look at comparison of men and women at the three major levels of education).

GIC LAW 1: Do pro-natalist policies or anti-natalist policies exist? If so, explain them. [Examples would include payments, allowances, tax credits, cash payments, paid maternity leave, or policies that reduce benefits if more than two children are had, etc.]

GIC LAW 2: Are the benefits tied to employment or marital status or any other status?

GIC LAW 3: What kind of childcare benefits are available? [Include information on maternity leave—both here and under Law 1.]

ERBG DATA 1: Is there an earning gap between men and women in comparable professions, especially those of high status? [High status professions might include professors, managers, doctors, lawyers, etc.]

ERBG DATA 2: What is the percentage of women in the workforce? What percent of the economically active female population is unemployed? Provide comparison figures for men. What percentage of top management positions are held by women?

LBHO DATA 1: What percentage of legislators are women?

MULV LAW 1: Does the state provide benefits [such as retirement] for those who stay out of the formal labor force to care for children?

MULV DATA 1: What is the estimated economic value of unpaid work in the nation (preferably disaggregated by gender, and expressed in monetary terms as well as a percentage of GDP), and what methodology was used for that estimation? What percentage of women are economically inactive in the formal economy? [These are women who, for whatever reason, have chosen not to participate in the traditional workforce outside of the home. Compare to men.] Do women drop out of the labor force at marriage or birth of a child or not at all?

SAB PRACTICE 1: How socially acceptable is breastfeeding? Are there government programs in place to encourage breastfeeding or discourage artificial feeding?

SAB LAW 1: What are the laws regarding breastfeeding? Has the government endorsed the WHO Code against marketing breastmilk substitutes? Are there laws concerning breastfeeding in the workplace?

SAB LAW 2: Is breastfeeding in public restricted at all? If so, where is it illegal? Is there an explicit exemption of breastfeeding women from laws against indecent exposure? (Discuss, if you wish, what the laws on indecent exposure are.)

SAB DATA 1: What is the percentage of babies breastfed at birth?

SAB DATA 2: What is the percentage of babies breastfed at six months?

SAB DATA 3: What is the average weaning age?

SEGI PRACTICE 1: Are gender issues a topic of public discourse with society? Are there topics that are taboo? Who is speaking out on gender issues in society? Are there certain prominent government or religious figures involved?

SEGI PRACTICE 2: If a discussion on gender issues occurs within society, how is that discussion received? Is it dismissed, a cause for anger, etc.?

SEGI PRACTICE 3: Are those who discuss gender issues within society punished by society, by the government, by employers, etc.? Is the punishment different for women as versus men?

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