Applying Intersectionality & Complexity Theory to Address the Social Determinants of Women's Health

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It is now well recognized that the compounding effects of lack of access to education create far reaching implications for income, access to the goods and services of society, and women's physical and psychological health. A social determinants of health (SDH) perspective takes aim at the structural causes-of-the-causes of social and material deprivation that lead to ill health. This paper builds on previous work (McGibbon & Etowa, 2007; McGibbon, 2009; McPherson & McGibbon, 2010) to describe how feminist intersectionality theory can be applied in tandem with complexity theory to support the amelioration of inequities in the social determinants of women's health. We explore the ways that this bridging can further our understanding of social and economic marginalization of women. A brief overview of feminist intersectionality theory is presented, with an emphasis on its utility for extending an analysis of intersections of the SDH. We hope to stimulate a debate about how feminist intersectionality theory, feminist political economy, and complexity theory are natural antecedents to inform public policy to address SDH inequities in women's health. A case example grounds our theoretical discussion in the everyday pointy edges of how material deprivation unfolds in women's everyday lived experience.

It is now well recognized that biologic and genetic endowment, although very important in determining health, are not the major determinants of the health of individuals, families, communities, and nations (Raphael, Bryant, & Rioux, 2006; Raphael, 2009). Rather, the social determinants of health (SDH) play the major role in shaping health outcomes. For example, the compounding effects of lack of access to education create far reaching implications for income, access to the goods and services of society, and physical and psychological health. A social determinants of health (SDH) perspective increasingly takes aim at the structural causes-of-the-causes of social and material deprivation that lead to ill health. This paper builds on previous work (McGibbon &

Etowa, 2007; McGibbon, 2009; McPherson & McGibbon, 2010) to describe how feminist intersectionality theory and complexity theory may be fruitfully applied to support the amelioration of inequities in the social determinants of women's health. We explore some of the ways that this bridging can further our understanding of social and economic marginalization of women, including implications for identifying public policy solutions to support health and well being. A brief overview of feminist intersectionality theory is presented, with an emphasis on its utility for extending an analysis of intersections of the SDH. We argue that three intersecting areas of SDH produce a complex synergy of disadvantage and oppression: the SDH as described in the Toronto Charter (Raphael, 2004), and updated by Mikkomen and Raphael (2010); the isms as SDH; and finally, geography as a SDH.

Evidence is provided about the ways that these synergies produce inequities in SDH across the lifespan. We discuss some of the ways that feminist intersectionality theory, feminist political economy, and complexity theory are natural antecedents to inform public policy to address SDH inequities in women's health. A case example grounds our theoretical discussion in the everyday pointy edges of how material deprivation unfolds in everyday lived experience. It is not our intention to debate the ins and outs of intersectionality theory, which has been done elsewhere (See Davis, 2008). Rather, we ground our discussion in the everyday realities of social and health inequity that drive disparities in women's health outcomes nationally and globally. Our goal is to bring this complex topic into the real world of human suffering and into the political economy and public policy realm where solid and creative solutions can be demonstrated. We acknowledge that intersectionality, complexity theory, and the social determinants of health are significant areas of knowledge and we make no claim to provide an extensive overview. Rather, we hope to introduce a debate about how these areas may be fruitfully combined to further knowledge and action in the area of women's health inequities.

New Approaches to Tackling Health Inequities: Building on Intersectionality Theory

Feminist intersectionality theory has been well developed over the past several decades, most notably by Black feminist scholars such as Kimberle Crenshaw (1989), bell hooks (1990), Patricia Hill Collins (1990, 2002, 2005) and Agnes Calliste and George Sefa Dei (2000). The term was first introduced by Crenshaw as a way to bring forward the absence of Black women's experiences in both feminist and anti-racist discourse, where analyses of the intersections of racism and sexism were consistently absent. "When feminism is defined in such a way that it calls attention to the diversity of women's social and political reality, it

centralizes the experience of all women, especially the women whose social conditions have been least written about, studied, or changed by political movements" (hooks, 1990: 52). Collins (1990) described how oppressions in society do not operate independently. Rather, they intersect in complex patterns—additive models that view each oppression as 'additive' rather than interlocking, fail to stress the centrality of power and privilege. Identities, sometimes referred to as identity markers (Hum & Simpson, 2003), intersect to compound oppression. Age, culture, (dis)ability, ethnicity, gender, immigrant status, race, sexual orientation, social class, and spirituality all denote social location, a powerful determinant of one's access to the social and material necessities of life.

The oppressions of sexism, racism, heterosexism, and ageism, to name a few, can and do happen together to produce a complex synergy of material and social disadvantage. Here, synergy implies working together, fusion, coalescence, and symbiosis—the parts interacting to form a complex whole that cannot be disentangled into any single phenomenon. A core underpinning of the concept of feminist intersectionality is the focus on interrogation of power in society and the structural precursors of oppression. They are called structural because "they are part of the political, economic, and social structure of society and of the culture that informs them" (Navarro, 2007. p. 2). This focus on the structural causes of inequities makes feminist intersectionality theory a natural theoretical underpinning for informing policy to address inequities in the SDH as they pertain to women and other vulnerable populations.These structural determinants of health are by their nature complex and changing, as are their public policy antecedents.

These causes-of-the-causes of ill health have been clearly described within a political economy of health perspective. Authors such as Navarro (2002, 2004) and Esping-Anderson (2002) have, over the past decade, provided detailed discussions of the ways that a political economy approach can provide solution-focused insights about how to tackle health inequities and their genesis in material and social deprivation. A political economy approach "interrogates economic doctrines to disclose their sociological and political premises...in sum, [it] regards economic ideas and behavior not as frameworks for analysis, but as beliefs and actions that must themselves be explained" (Mayer, 1987, p. 3). Marx (1845/1977) was the first to describe a methodological approach to understanding the linkages among society, economics, and history. Rather than viewing the field of economics as consisting of objective and quantifiable sets of measurements and models, he explored a new way to think about economics where the politics of a nation very much influenced the direction and outcomes of its economic policy.

Marx (1845/1977) explained that in order to survive and continue existence from generation to generation, it is necessary for human beings to produce and reproduce the material requirements of life. Materialist approaches are based in his assertion that economic factors—the way people produce these necessities of life— determine the kind of politics and ideology a society can have. A political economy lens is central to modern efforts to understand and tackle the causes-of-the-causes of social problems, including growing inequities in health outcomes related to intersections of classism, racism, and sexism, to name a few (McGibbon, 2010).

Political economy analyses, grounded in the work of Marx and Engels, continue to focus on social class as a key marker of material and social well being. However, as early as 1989, feminist political economists Armstrong and Connolley stated that "class has to be reconceptualized through race and gender within regional, national, and international contexts…Class is dynamic and relational; it is the basis of change. Gender, race/ethnicity and regionality/nationality interact with class in various ways with one being more salient than another at different points in time" (Armstrong & Connolley, 1989: 5). Consistent with a materialist perspective, these interactions have a profound and long-lasting impact on the social and material conditions necessary for health and well being. How one goes about attaining these everyday necessities, and indeed one's chances of attaining them, are articulated to ruling relations in capitalist societies (Smith, 1987, 1990).

Feminist sociologist, Dorothy Smith (1999) described relations of ruling as a complex of organized practices, including government, law, business and financial management, professional organizations, and educational institutions as well as the discourses and texts that interpenetrate the multiple sites of power. Feminist political economy emphasizes how these relations of ruling organize and regulate our lives in contemporary society (Smith, 1999). This perspective brings to light some of the ideological underpinnings of modern day inequities. For example, under the current reign of neo-liberalism, the accumulation of wealth within and among countries (for neo-liberal economists the sign of a healthy economy) is diminishing the possibility of social provisioning for a growing number of people in poverty and in the middle classes. The poverty-wealth gap is increasing, and as the evidence in the following sections indicates, there are profound consequences for women's health and well being (Riley, 2008).

Feminist political economy and feminist intersectionality frameworks have much in common and integration of intersectionality theory continues to broaden political economy analyses (Vosko, 2002). This fusion is evident in the values of feminist political economy:

- Human well-being is the foundational value; gender equality is central to human well-being;
- Human rights, especially economic and social rights;
- Women's personal autonomy within relationships of reciprocity;
- Women's moral and political agency;
- Recognition and valuation of women's work of social reproduction—a value and an activity;
- Embracing differences and eliminating discrimination—racial, ethnic, sexual preferences,
  class/caste, religious and national origin;
- Ecological and environmental sustainability in the promotion of well-being and social
  reproduction;
- Social cohesion and solidarity across families, communities, regions and nation states;
- Global common good.

Consistent with a feminist political economy approach to understanding inequities, feminist intersectionality frameworks emphasize "an understanding of the many circumstances that combine with discriminatory social practices to produce and sustain inequity and exclusion. Intersectional feminist frameworks look at how systems of discrimination such as colonialism and globalization can impact the combination of a person's social or economic status, race, class, gender, and sexuality" (Canadian Research Institute for the Advancement of Women, 2006: 7). Feminist intersectionality theory provides a comprehensive foundation for interrogating the multiple ways that the SDH shape women's health across the lifespan. Mental and physical health impacts of the intersections of race, class, gender, and ethnicity have been described in the literature for almost a decade, although this area of research remains in its infancy (Kohn & Hudson, 2002; Krieger, 2003; Weber, 2005). McGibbon & Etowa (2007) explored the health impacts that result when the SDH intersect with identities such as race, social class, and gender, and furthered thinking about intersectionality to include the ways that geographies are antecedents of compromised health outcomes.

Hankivsky and Christofferson (2008) described the relationships between intersectionality and the social determinants of health, and argued for an exploration of "the innovative paradigm of intersectionality to better understand and respond to the foundational causes of illness and disease" (Abstract). Wilkinson (2003) furthered the discussion in Canada about academic, research, and policy challenges related to the application of intersectionality. She argued that a key problem is that programs and policies do not often reflect the lived

experience of Canadians, and that individuals with many different intersecting identities should be considered when legislation is proposed and programs are designed. Hankivsky, Cormier and de Merich (2009) and Hankivsky and Cormier (2010) described how intersectionality can inform women's health research and policy:

> *Intersectionality is increasingly being adopted as a new paradigm which seeks to counteract one-and two-dimensional approaches by bringing to the forefront the complexity of social locations and experiences for understanding differences in health needs and outcomes … (Hankivsky & Cormier, p. 1)*

McGibbon (2009) proposed an intersectionality lens to strengthen a human rights perspective on health care access. This lens integrated core concepts of intersectionality theory with a critical theoretical perspective on the social determinants of health (SDH). She argued that health inequities could be usefully described as intersections of three areas: the SDH as laid out in the Toronto Charter (Raphael, 2004), the isms as SDH; and the geographic or spatial contexts of oppression as SDH. McGibbon adapted the language of 'identity and identity markers' to propose an explicit incorporation of the structural rather than individual genesis of inequities—the isms. An intersectionality lens has also been used to describe how primary health care renewal can inform policy to improve the social determinants of child mental heath (McPherson and McGibbon, 2010).

It is important to note that conceptualizations of the SDH have evolved to include some identities, most notably gender and race, increasingly evidenced as predictors of mental and physical health outcomes (Mikkomen & Raphael, 2010). Figure 1, *The Synergies of Oppression: A Lens for Tackling SDH Inequities*, builds on previous work to depict some of these ideas. The lens is grounded in the interlocking, rather than additive, nature of the SDH, the isms, and the geographic or spatial contexts of oppression. In keeping with evolving definitions of the SDH, Figure 1 illustrates that gender, race, and disability as SDH are reflected in the intersections of the isms (sexism, racism, and abeism) as a SDH.

Note that elements in each of the three areas also intersect among themselves. For example, in terms of intersections of the SDH, lack of education has been shown to negatively impact employment, which in turn impacts food and housing security. These areas intersect to compound individual, family, and community health struggles. In the area of the isms, sexism, racism, and discrimination against immigrant women result in the "healthy immigrant effect" where the health of immigrant women deteriorates after immigration (Spitzer, In Press).

Geographic or spatial contexts of oppression point to urban and rural differences in health that are further compounded by segregation and ghettoization. When we consider how the three areas (SDH, the isms as SDH, and geography as SDH) in turn intersect with each other, as Figure 1 illustrates, the concept of synergy provides a useful way to grasp the complexity of the health and social impacts of all these intersections across the lifespan. For example, while food insecurity or housing insecurity create certain physical and mental health stresses, women who experience both of these struggles at the same time are impacted in a way that defies a simplistic additive analysis. Rather than attempt to simplify these concepts, it is crucial that we continue to integrate their complexity in discussions and policy action to identify racist, classist, and sexist underpinnings of health inequities.

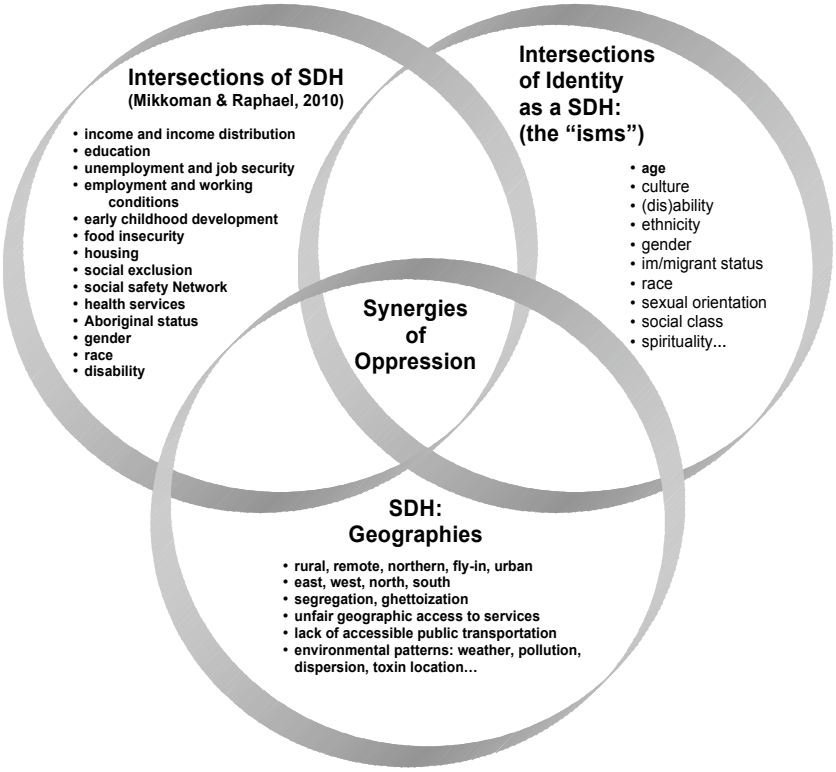

Figure 1: Synergies of Oppression: A Framework for Addressing SDH Inequities

Adapted from previous work: McGibbon & Etowa, (2007); McGibbon (2009); McGibbon & Etowa, (2009); McPherson & McGibbon (2010); McGibbon (2010, in Press)

Synergies of Oppression: The Evidence

The synergistic nature of intersections of the SDH, as illustrated in Figure 1, are inscribed on the bodies of women and their children. The following discussion and accompanying statistics illustrate some of the ways that oppressions operate in a synergistic manner. We draw upon national and international evidence to emphasize the urgent policy imperative for social change to tackle inequities in the SDH. We show how lack of access to education operates in synergy with unemployment and underemployment, which in turn increase the likelihood of food and housing insecurity, and ultimately increases heath inequities. Racism, heterosexism, and ableism contribute yet another constellation of complexity that is borne out in health outcomes across the lifespan.

Intersections of SDH & the isms

Intergenerational poverty remains a persistent hallmark of oppression. Employment is a pivotal marker of family and community well being, and consistent and meaningful employment provides a pathway out of the shackles of poverty. The sheer weight of evidence tells us that the isms are directly proportional to one's employment opportunities. Canadian women are less likely to be employed than men and they earn an average of 62% less. The income of women aged 55-64 is barely over half that of men in their pre-retirement years (Statistics Canada, 2005). Gender intersects with race to cause an even higher rate of unemployment among immigrant, Indigenous and African Canadian women (Galabuzi, 2006; Statistics Canada, 2006). Immigrant women of color, who earn less than the Canadian average for women, face additional barriers related to geography— their extended families are often far away and many immigrant individuals and families lack the resources to maintain connections with their country of origin.

Low income has particular consequences for persons with disabilities, who may have the additional burden of costs such as those associated with mobility enhancement, special diets, and physical rehabilitation therapies. Women with disabilities are twice as likely to be unemployed when compared to the Canadian average for women (Statistics Canada, 2005). In 2000, women with disabilities aged 15 and over had an average income from all sources of $17,200, almost $5000 less than women without disabilities, and $9,700 less than men with disabilities (Statistics Canada, 2005).

It is important to note that gender also dictates the division of work or labor in both the public sphere of production and in the private sphere of the household. Traditional economic analyses consider these two spheres as largely separate. However, they are integrally related, with significant differential implications for women and men (Riley, 2008). Social reproduction, the work of nurturance of the human family

and community, is an economic category as well as a work of care, and has great significance in terms of the functioning of the national economy (Riley, 2008). The majority of women subsist by combining paid employment and unpaid domestic work to maintain themselves and their households. This situation is further compromised by women's greater vulnerability due to the nature of their relationship with the labour market. As noted by Jackson (2008) in *Social Determinants of Health: Canadian Perspectives*, women often accepted part-time employment although they wanted full-time employment. This situation highlights the lack of flexibility in the Canadian labour market in its capacity to accommodate the primary care responsibilities of women, and further explains some of the structural causes of women's higher relative poverty rates.

The racialization and feminization of poverty in Canada has been well documented (Wallis & Kwok, 2008). Inadequate and precarious employment continues to sustain a higher poverty rate for women, especially elder women and women of color. Social class and relative poverty have become the strongest indicators of health (Raphael, 2009). This finding has profound implications for health and well-being, and points to structural, rather than individual-based lifestyle, roots of ill health. The low-income rate among the most recent immigrants to Canada almost doubled from 1980 to 1995, before easing back during the last half of the 1990s (Statistics Canada, 2003). As a result, the gap in the low-income rate between recent immigrants and Canadian-born individuals widened significantly during the past two decades. In 1980, low-income rates among immigrants who had arrived between 1975 and 1980 were 1.4 times those of people born in Canada. In 1990, low-income rates among immigrants who arrived between 1985 and 1990 were 2.1 times those of Canadian-born adults. By 2000, low-income rates among recent immigrants were 2.5 times those of Canadian-born adults (Statistics Canada, 2003). Statistics Canada defined 'recent' immigrants as those who arrived in Canada during the five years before the census in question. Immigrants of color have the compounding burden of racism, which makes their incomes even less, on average, than the general population of immigrants in Canada (Galabuzi, 2006).

Physical outcomes of oppression continue to be consistently borne out in the health outcomes of citizens. The psychological and spiritual stress of chronic worrying about basic necessities such as food and shelter happen concurrently with all the associated bodily stresses. These bodily stresses are the embodiment of poverty across the lifespan (McGibbon, In Press). The physical impacts of damp housing, heat insecurity and food insecurity are well documented. The strikingly high prevalence of asthma in North America and the United Kingdom, among other areas, has been clearly linked to substandard housing, and

geographic proximity to crowded urban centers. Children living in damp and moldy dwellings have a greater prevalence of respiratory symptoms including wheezing, sore throats and runny noses, as well as headaches and fever, compared to children in dry houses (Beasley, Masoli, Fabian, & Holt, 2004). People with asthma are more than twice as likely to live in damp houses. Low housing temperatures have been shown to lower resistance to respiratory infections; damp housing leads to mould growth and fungi, which can cause allergies and respiratory infections; and cold impairs lung functions and can trigger broncho-constriction and asthma (Beasley, Masoli, Fabian, & Holt, 2004; Shelter Cymru, 2004).

Bryant (2009) notes that lone-parent families, over 80% of which are led by women, are more likely to be in core housing need compared to other family types. Housing need is defined according to three standards: adequacy (dwellings are those that do not require any major repairs), suitability (dwellings have enough bedrooms for the size and make-up of resident households) and affordability (dwellings cost less than 30% of before-tax household income).

A household is considered to be in core housing need if its housing falls below at least one of these standards and if the household would have to spend 30% or more of its before-tax income in order to pay for accommodation that is acceptable (Canada Mortgage and Housing, 2010).

Housing insecurity is compounded by food insecurity, a growing social concern in Canada (Tarusuk, 2005). Families and individuals who lack food security: (1) experience uncertainty that they will be able to acquire and consume adequate quality and quantity of food in mainstream ways, (2) consume nutritionally inadequate food, (3) consume reduced quantity and quality of food, and (4) acquire and consume food in non-mainstream (socially unacceptable) ways or by incurring further disadvantage (deplete assets, not spending on necessary medications, etc.) (Rainville & Brink, 2001). According to Tarusuk (2005), food insecurity was recognized as a problem in Canada in the early 1980s when community groups began to establish charitable food assistance programs in response to concerns that people in their midst were going hungry. Since then, the number of Canadians affected by food insecurity has steadily grown.

When individuals, families, and communities experience chronic poverty, the cumulative stress of worrying about food, shelter, and a myriad of other deprivations leads to chronic anxiety and sometimes depression. The everyday and relentless nature of this kind of worry is difficult to fathom unless one has personal experiences of these material struggles. As Willem de Kooning, the Dutch born American painter, pointed out, The trouble with being poor is that it takes up all of your time (Herskovic, 2003) Physical stresses of food insecurity, such as

inadequate money for food, especially fresh food, and housing insecurity such as living in damp housing with insufficient heat, happen in tandem with the spiritual and psychological stresses of *chronic worry* about food, shelter, and heating. These worries, along with the stresses of everyday racism, sexism, misogyny, homophobia, and the impacts of colonialism, have a profound impact on the body's stress managing system, the adrenal system. The system becomes overwhelmed and is unable to maintain physiological balance. The result is adrenal fatigue. Adrenal fatigue causes depression, obesity, hypertension, diabetes, cancer, ulcers, chronic stomach problems, allergies and eczema, autoimmune diseases, headaches, kidney and liver disease, and overall reduced immunity (Varcarolis, 2008). These physical and mental health outcomes of adrenal fatigue are embodied in oppressed peoples.

A key, unique aspect of an environment of poverty is cumulative exposure to multiple adverse physical and social stressors (Evans & English, 2002). Of particular concern is the robust relationship between poverty or low socioeconomic status and childhood stress (Evans & Kim, 2007; McPherson & McGibbon, 2010). This stress has been documented to produce a wide range of physiological and socio-emotional difficulties in children, including chronic disregulation of the cardiovascular system, disruption of the body's stress regulation system as described above (Evans & Kim, 2007), depression, and low achievement (Alaimo, Olsen & Frongillo, 2002). The scope and depth of the impact of childhood poverty on long term mental health is further evidenced by the inverse relationship between poverty and working memory in young adults (Evans & Schamberg, 2009).

Galabuzi (2006) has written extensively about the interconnections among racism, social exclusion, unemployment, underemployment, individual and family income, and education. As Canada enters the first decades of a new century, racialized peoples continue to experience stark inequities related to each of these SDH. The income gap between racialized and non-racialized earners continues to be an important indicator of racial inequity in Canada, as demonstrated by unemployment, labor-market participation, and employment income (Galabuzi, 2006). Galabuzi reports that employment income for racialized peoples is 15% lower than the national average; for racialized women, the inequity is even greater- average earnings in 1996 were $16,621, compared to $23,635 for racialized men, $19,495 for other women, and $31,951 for other men.

In terms of education, the proportional numbers of racialized group members achieving post-secondary degrees is growing at higher rates than in the general population. Yet there has not been a corresponding increase in employment or income. So what factors cause this discrepancy? As Galabuzi (2006) points out, the discrepancy

suggests an 'x', or unknown, factor: "This 'x' factor is the devaluation of the human capital of racialized group members, resulting from racial discrimination in the labor market" (Galabuzi, 2006: 111). Income is closely related to social determinants such as chances of attaining an education and ability to eat healthily. These social determinants also intersect with identity and geography to compound disadvantage for racialized peoples. Table 1, *Racism as a Social Determinant of Women's Health*, provides evidence of the ways that oppressions related to the SDH combine to amplify health concerns of people of color.

Table 1: Racism as a Social Determinant of Women's Health*

- Chronic and infectious disease rates are higher in Indigenous women and men (First Nations, Inuit, and Metis) on and off reserve, than in non-Indigenous Canadians: arthritis and rheumatism (26% for Indigenous peoples, 16% for non-Indigenous), high blood pressure (15% *vs* 13%), tuberculosis rate per 100,000/year (21% *vs* 1.3%) (Canadian Population Health Institute, 2004).
- Ethnic minority women are diagnosed with more advanced disease and experience greater morbidity and mortality (Kim, Ashling-Giaw, Kagawa-Singer, & Tejero, 2006).
- Black women are 30% less likely to be diagnosed before 3rd stage cervical cancer; and 20% less likely to be given pain medication for cervical cancer than white women (Smith, 2005)
- Black women are less likely than white women to be screened or to present with asymptomatic disease (Merkin, Stevenson & Powe, 2002).
- Visible minority women are less likely to be administered a mammogram for breast cancer screening or given a Pap test for cervical cancer screening when compared to white women (Quan et al., 2006).
- First Nations women in Canada have a 20.8% higher rate of cancer than the general Canadian population (Assembly of First Nations, 2007).
- Visible minority women were less likely that white women to be administered a mammogram or given a Pap test (Quan et al., 2006).
- Black women have more than twice the risk of developing adult-onset diabetes than white women. Black men have more than 1 ½ times the risk of developing diabetes (Brancati, Kao, Folsom, Watson, & Szklo, 2000).

***Please note:** The information reported in this table cites the terms used by the authors of the studies (i.e. Black, African American, Hispanic, Aboriginal, Ethnic Minority, Visible Minority, White, Caucasian, etc).
Source: Adapted from McGibbon (2010, In Press); McGibbon & Etowa (2009).

The geography of segregation and its relationship to social inequity cuts across numerous geographies of place, space, and time. For

example, recent literature suggests a growing relationship between the clustering of certain visible minority groups in urban neighborhoods and the spatial concentration of poverty in Canadian cities, raising the specter of ghettoization (Galabuzi, 2006; Walks & Bourne, 2006). Geography is relational and many aspects intersect to shape the context of women's health inequities: rural, remote, northern, southern, east, west, urban, geographic segregation and ghettoization, to name some of the most prominent areas for consideration. People living in geographies with high pollution rates have an unfair toxic burden which is not necessarily reflected in increased access to cancer and respiratory health care. Hazardous waste facilities, landfill sites, and incinerators are all disproportionately located near communities of color, regardless of country or region (Cole & Foster, 2000).

Geography thus acts as a foundation that underscores inequities in the SDH, and hence inequities in women's health outcomes. Issues related to sub-standard and overcrowded housing, exposure to hazardous materials and elevated levels of pollution all disproportionately affect those living in poverty in urban centres, especially women (Canadian Institute for Health Information, CIHI, 2008). A 2004 study by the Canadian Institute of Health Information (CIHI, 2004) found that women aged 65 and over were in the lowest income quartile across urban centers in Canada. In 1996, central cities, or the urban core of Canada's largest cities, had a poverty rate about 1.7 times that of the surrounding suburban areas (27% in the urban core versus 16% in suburban areas) (Lee, 2000). Consistent with high poverty rates among urban families, at the neighborhood geographic level there are higher-than-average pregnancy complications and infant mortality rates among those in the poorest neighbourhoods—7.1 deaths per 1,000 live births in Canada's poorest neighbourhoods—compared with 5.0 deaths per 1,000 live births in Canada's richest neighbourhoods. These geographic inequities thus help to create the substrate for lifelong and intergenerational poverty for women. This evidence demonstrates the synergy of intersections of the SDH, the isms as SDH, and geography as an SDH. These synergies interact in complex and changing patterns over time, all within the context of the systemic oppressions that create and sustain inequity in women's lives. These interactions and relationships defy linear analyses. Much can be gained by embracing their complexity and the necessary complexity of any efforts to reduce SDH inequities.

Intersectionality & Complexity Theory

Local, regional, national, and international systems of inequity are inextricably linked and cannot be ameliorated without an analytic focus on how these complex systems act together in a complex web of larger systems that coalesce to produce growing health and social

inequities for women. Although feminist intersectionality theory allows us to envision the ways that oppressions come together to compound women's struggles, it may be argued that it falls somewhat short of describing the interactions within this web of larger systems, particularly the health and social service systems. For example, reduction of health inequities requires a dedicated and consistent analysis of the systemic oppressions that cause them. Human and ecological health are highly complex interactive systems involving knowledge along a continuum from women's individual biophysiology and psychosocial well being, all the way to feminist understandings about the political economy of health.

Systemic racism and sexism interact synergistically with systemic oppressions in government and health care systems. These systemic oppressions cannot be decomposed into subsystems and these into smaller subsystems in any meaningful way— they are inextricably enmeshed. Although the links between systemic sexism and racism and the everyday experiences of women and girls is a necessary aspect of the analysis, everyday sexism is not a stand-alone system. It is an integral aspect of many systemic oppressions and the ruling relations that create and sustain them. This interrelationship makes intuitive sense; however, it is very difficult to translate into language and actions that might inform system change and help to illuminate women's experiences of inequity and discrimination. The following section explores some of these relationships. A complexity theory approach, one that views the public service system as a complex adaptive system, holds great promise for unpacking the complexities inherent in health inequities. We emphasize the theoretical consistencies between feminist intersectionality theory and a complex adaptive systems perspective, where both constructs integrate the language of multiple perspectives and the ways that these perspectives are intimately linked to systemic structures.

Feminist intersectionality scholars, such as McCall (2005) and Gressgard (2008) have discussed intersectionality theory within the context of complexity, thus underscoring methodological and practical challenges when the subject of analysis expands to include multiple dimensions of social life and categories of analysis. McCall described three categories to explore the complexity of intersectionality in social life: anticategorical, intercategorical, and intracategorical complexity. McCall problematizes the assignment of categories of identity (e.g. race, ethnicity, social class) and discusses the ethical and theoretical implications of categorization in intersectionality theory. (Please see McCall, 2005 for an extensive account of anticategorical, intercategorical, and intracategorical complexity). While these distinctions in feminist intersectionality theory are consistent with our use of the word

'complexity' in this paper, our discussion focuses on its use explicitly in the context of complexity theory.

"Complexity theory, or the study of complex adaptive systems, has its roots in physics, mathematics, and biology. It has now expanded into organizational and systems of organizations and it is highly multi- and inter-disciplinary. It has appeal across a number of disciplines that seek to answer questions about living, changing systems" (McPherson, 2008, p. 229). Although complexity theory has many origins, one of its key thinkers is physicist Fritjof Capra (1975, 1982, 1987). Capra critiqued Cartesian, liner approaches to understanding natural and social phenomena. He described how information about systems may be generated by examining the relationships among all the parts of the system, and how these relationships contributed significant additional factors in the character of the whole. His work emphasized the web-like structure of all systems and thus the interconnectedness of all system parts.

Complexity science is not a unified theory—it is a collection of theories and constructs that have conceptual integrity among themselves (Begun, Zimmerman, & Dooley, 2003). Complexity theory, as a theoretical perspective within complexity science, specifically considers complex adaptive systems. Begun et al. (2003) explained that the *complex* portion of complex adaptive systems implies diversity—a wide variety of elements. *Adaptive* suggests the capacity to change and to learn from experience. In complex adaptive systems theory the *systems* refers to elements that are independent agents. These agents are located within a densely connected interacting web and the agents act based on local knowledge and conditions. This *system* aspect is not associated with the traditionally used machine metaphor (Morgan, 1997). Begun et al. (2003) contended that use of the machine metaphor for organizational systems has not led to effective organizational research and practice. They stated that health care organizations are an ideal setting for the application of complexity theory because of the diversity of organizational forms and often unpredictable interactions among these evolving and interdependent organizations.

Begun et al. also used the example of the health care system and noted that "linkage, coordination, rationalization, and vertical and horizontal integration have failed to advance health care delivery to acceptable levels of satisfaction for both internal and external stakeholders" (Begun et al., 2003, p. 254). These authors argued that thoughtful consideration of health care and similar organizations such as the education, justice, and social services would be better facilitated by application of the metaphor of the system as a living organism, rather than the system as a machine. Traditional systems theory (e.g. Senge, 1990) has its origins in explaining the behaviour of non-living systems,

such as machinery. Complexity theory reformulates our view of a system as it attempts to explain how living systems work. "The messy, open systems of complexity science are immensely different from the closed, well-behaved systems that were the original focus of systems science" (Begun et al., 2003: 255).

The concepts inherent in a complex adaptive systems perspective—densely interconnected webs and networks and complex interactions of systems within systems—are natural partners that can be fruitfully explored within feminist intersectionality theory. This larger systems perspective incorporates conceptualizations of oppressive societal systems and can provide a language and a practice to bring feminist theory more explicitly into the realm of health and social systems and the political economy of women's health inequities. Feminist intersectionality theory focuses on systemic solutions, but there has not yet been a bridge between feminist intersectionality theory and complex adaptive systems applications to health and social systems.

Sawyer's (2005) and Begun et al's (2003) description of complex adaptive systems illustrate the potential utility for bringing feminist intersectionality theory into the world of complexity science. According to Sawyer, (2005) complexity theorists have argued that there are four properties of complex adaptive systems: a) many components interact in densely connected networks; b) global systems functioning cannot be localized to any one subset of components, but rather are distributed throughout the entire system; c) the overall system cannot be decomposed into subsystems and these into smaller subsystems in any meaningful fashion; and d) the components interact using a complex and sophisticated language. These properties were originally developed to describe complexity of biological and physical systems. Consistent with Sawyer's work, Begun et al. (2003), in discussing public health systems as complex adaptive systems, outlined four common features of complex adaptive systems. They exhibit (a) a dynamic state with constant interacting forces, (b) relationships that are massively entangled, (c) emergent, self-organizing behaviour with extensive communication among agents that can spread norms, and (d) a robust adaptation mechanism and an ability to alter themselves in response to feedback, which helps them to survive a variety of environmental conditions. Begun and colleagues also added two propositions arising from chaos theory (Gleick, 1987) that are particularly relevant as social scientists apply complexity science: (a) "small, seemingly inconsequential events, perturbations, or changes can potentially lead to profound, large scale change," and (b) "what appears to be random may in fact have an underlying orderliness to it" (Begun et al., 2003: 258).

In an application of complexity theory to examine public service changes, Wallace (2007) outlined key characteristics of complex public

service change. He suggested that complex change is: large scale, componential, systematic, differentially impacting, and contextually dependent. Wallace, Fertig, and Schneller (2007) noted that health and education sectors, as the largest and most complex public services, offer the most potent insights of the complexity of change and strategies for dealing with it. Further, in complex adaptive systems, renewal and long term viability requires what complexity science calls *destruction*; a transformative breaking down of the old so that change can emerge. Complexity theory is increasingly being applied to social systems as complex adaptive systems, and the aforementioned properties of these systems can usefully be applied to the study of SDH inequities. Intersections of the isms are complex in and of themselves, and many solutions to tackle SDH inequities live within the public system, which itself is also a complex adaptive system. Since public policy change and strengthening is already a complex process, it is imperative that public policy making incorporate these system-based complexities in order to comprehend and design strategies to reduce SDH inequities.

Policy Applications

Despite its potential for informing public policy action to reduce inequities in the SDH, intersectionality remains a relatively unknown and underdeveloped concept in policy discussions and applications (Hankivsky, Cormier, and de Merich, 2009). Methods for integrating intersectionality in policy are in their infancy, and applying intersectionality to the typical policy cycle requires a rigidity that does not match the reality of social issues. "It is important to note that the policy cycle model often seems flawed inasmuch as it exaggerates the tidiness of a process that is altogether more complex, fluid, and nuanced" (Hankivsky et al., 2009 36-37). Although policy change is certainly integral in addressing SDH inequities, we argue that it is policy change *within the context* of changing public systems, as a complex adaptive systems, that we must embrace to successfully integrate feminist intersectionality to challenge existing models of policy change. McPherson (2008) argued that without explicit attention to complex adaptive systems, it is unlikely that social problems such as persistent child poverty will be ameliorated.

This linking of feminist intersectionality and complexity theory, with its complex adaptive systems perspective, differs substantially from conventional and still dominant thinking about how public policy can be created or changed to address inequity. If we start with the premise that any system such as the health or social service system is composed of many components that interact in densely connected networks, we can predict the relative inefficacy of targeting childhood poverty through the provision of a flat rate federal government supplement for each family.

Similarly, addressing barriers in access to health services primarily through increasing clinic hours confines the solution to a very small aspect of access in a complex adaptive system that is fraught with oppressive practices (McGibbon & Etowa, 2009). These oppressive practices are embedded in systemic oppressions such as classism, racism, and sexism, all of which operate within complex public service systems, with their inherent densely connected networks.

The following case example describes how some of these networks might come together in everyday life. We describe many of the practical barriers that Marya, a young girl with a chronic health condition, and her family must navigate in an attempt to access care. As the case demonstrates, these barriers are wholly related to intersections of SDH inequities. These inequities have a complex genesis, including lack of parental education caused by lack of money for post-secondary education, which is in turn caused by intergenerational poverty. Both parents have jobs that provide an annual income that is barely adequate for family sustenance, let alone adequate to accommodate a public system that assumes a store of extra money to navigate the chronic illness management system. Transportation for appointments, money for rehabilitative supports and devices, money for over-the-counter and prescription drugs, and a host of other chronic condition related family expenses, are not accounted for in current public policy in Canada.

These relationships (i.e., transportation, rehabilitation, pharmacological intervention), as Begun et al. (2003) pointed out, are massively entangled. There is no doubt of the immediate utility of a public policy to augment the family's capacity to buy prescription drugs. However, within a complexity theory approach, this solution is woefully simplistic. Social determinants of health inequities (i.e., those related to education, meaningful employment, and adequate family income), lack of streamlined public transportation that addresses geographic barriers to care, and lack of a public policy for universal access to medication, are all components of complex adaptive systems. These systems are in dynamic states that constantly interact in dense networks. Public policy design and implementation must demonstrate considerably better accommodation of these complex, structural roots of SDH inequities. Feminist intersectionality theory further augments this analysis by underscoring how intersections of gender, social class, and childhood disability further compound the daily struggles of Marya's family.

Taken together, complex adaptive systems theory and feminist intersectionality theory create a view into the complex landscape of inequity. These everyday experiences illustrate how intersectionality operates in the life of a little girl and her family. Although the individual struggles in the story may not be overwhelming, it is the synergy of social class, disability, and potentially race, more correctly classism,

ableism, and racism, that must be unpacked to appreciate the hardship experienced by this family. Further entangling the situation is the fact that the story unfolds in the context of systems within systems—labour practices and minimum wages that are not living wages, social services embedded within health services and vice versa, and the perilous status of the Canada Health Act, itself embedded in a capitalist political economy with a growing for-profit imperative.

Case Example
Health for Some: Chronic Illness and Canada's Working Poor

Marya (pseudonym) is 7 years old. She has recently been diagnosed with juvenile rheumatoid arthritis (JRA), an autoimmune condition which causes, among other problems, painful and possibly deforming swelling in her joints, particularly her ankles, her wrists, and her knees. Her family lives in a suburban area. The nearest pediatric rheumatologist is a 1 hour drive from the family home. Appointments are routinely booked without consultation regarding family availability, and canceling an appointment results in delays of up to six months for another appointment, even if Marya's condition worsens. Mom works as a cashier at a large supermarket ($9/hr), and dad works as a carpenter ($23/hr). His work is seasonal. Since the family must travel 1 hour in the city for an appointment, one of the parents must negotiate a full day off work (one hour each way, minimum of one hour spent waiting for appointment waiting and in the actual appointment; additional city travel time to pick Marya up at her school), thus losing a day's pay for each of Marya's 6 appointments each year (average $120 lost wages/ appointment = **$720**/year). Marya also has other autoimmune conditions, and her long term prognosis remains precarious and thus very worrisome for her parents. Public transportation is a last resort because it now requires much waiting at bus stops, often an excruciatingly painful experience for Marya, particularly in cold or damp weather. The family has a car, but it is only used for local travel due to its condition. They borrow a neighbor's car (gas and mileage, $50 return/appointment = **$300**/year). Even though the neighbors will not charge mileage, the material cost is still incurred.

The appointment with the rheumatologist happens in tandem with other specialist appointments with an occupational therapist and a physiotherapist. At the occupational therapy appointment, the therapist fits Marya with special support braces for her wrists. After the fitting and molding of the braces is complete, the parents are told that they must pay for the braces. They receive the bill two weeks later (**$88**). The occupational therapist at the community primary health care center recommends over-the-counter ankle supports for both ankles, which

Marya finds very helpful in decreasing her pain (**$50**). Marya's wrist movements are increasingly painful, and the physiotherapist recommends regular warm wax treatments at home. The device for warm wax treatments costs $425. The family opts for a double boiler (**$40**) and buys the first batch of wax at the grocery store (**$8**); however, mom and dad worry about the safety of implementing the wax treatments at home.

The physician recommends methotrexate, an immune system suppressant. Neither of the parents has a drug plan through their employment. The drug costs $38/month (**$456**/year). Between appointments, the family has access to the hospital's nurse clinician, who provides expertise via phone consultation as needed. Marya develops movement restricting deformities in some of her fingers. Her parents try to negotiate some adjustment with her school, and they are told that they will have to go through a process of having Marya declared disabled in order to obtain the laptop computer she needs to be able to write in class ($1,500). Dad works with his extended family to navigate the application process, but Marya must go without the computer, and is unable to take notes without a high level of pain, for at least her first term in Grade Two. Marya's parents strongly desire the expertise of a naturopathic physician who will work with their rheumatologist ($125 initial consultation). They have friends who have had very encouraging results with such an arrangement, and there is a highly respected naturopath with a practice near their home. They cannot afford the naturopath.

Minimum Family Financial Burden per Year: $1,662

Marya's situation is not dissimilar to the expenses and constraints experienced by thousands of Canadian families with children who have chronic conditions. Her story illustrates the myth of universality in Canadian health care access. Marya's long term prognosis will undoubtedly be heavily influenced by her family's socioeconomic circumstances. Parental unemployment at any time in the course of Marya's illness will have a devastating effect on their ability to maintain contact with health services, and thus on Marya's health. If Marya's family is from a racialized group, she will experience additional and powerful barriers related to racism in the health care system.

Source: Adapted from: McGibbon, E. (2009). Health and health care: A human rights perspective. In D. Raphael (Ed.). The social determinants of health. 2nd Edition. Toronto: Canadain Scholar's Press. (pp. 319-339).

The case example thus illustrates the urgent need for a complex adaptive systems approach to public policy making in the area of SDH inequities. We must ask ourselves moral questions about how this little girl's suffering is currently supported and condoned by public policy making that cannot yet understand or accommodate the complexity of intersectionality and its related SDH inequities. At the same time, this inadequacy is coupled with a public service system that resists incorporation of the root, structural causes of SDH inequities as described in the introductory sections of this paper.

"Economic and racial inequity are not abstract concepts, [they] hospitalize and kill even more people than cigarettes. The wages and benefits we're paid, the neighborhoods we live in, the schools we attend, our access to resources and even our tax policies are health issues every bit as critical as diet, smoking and exercise. The unequal distribution of these social conditions - and their health consequences - are not natural or inevitable. They are the result of choices that we as a community, as states, and as a nation have made, and can make differently. Other nations already have, and they live longer, healthier lives as a result." (Adelman,2008)

Policy intervention to address SDH inequities have been very challenging due to the complex genesis of material and social deprivation that leads to ill health. One of the greatest impediments to moving to policy action on the social determinants of health is the near absence of a structural approach to inequity (Raphael, In Press).

CONCLUSION

This paper has introduced some of the ways that feminist intersectionality theory, SDH inequities, and a complex adaptive systems perspective can inform public policy for progressive social change. How can these proposed theoretical linkages help to address the SDH inequities that drive women's health inequities? These fields of knowledge are complex in and of themselves and their confluence bears much more consideration. Systemic oppression is embedded within a complex adaptive system and oppressions operate in synergy within this system. Although intersectionality theory addresses this synergy, addressing SDH and health outcome inequities will be greatly enhanced by a simultaneous consideration of the complex adaptive public and private systems that generate and sustain inequities.

Experiences of inequity play themselves out in the actualities of women's everyday lives. The challenge is to analyze and describe the articulation of this everyday realm to its context in 'massively entangled' complex adaptive systems. This process could be greatly enhanced by resisting simplistic, linear attempts to understand inequities in women's

lives. Many current efforts remain within this linear frame, where assumptions about predictability and stability do not match the messiness and struggles of women's everyday worlds. Amelioration of the material and social deprivation experienced by women and their families is a health and social policy imperative. Progress could be greatly enhanced through consideration of the theoretical and practical interplay among feminist intersectionality theory, complex adaptive systems, and public policy.

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