

Applying Critical Realism in Qualitative Research: Methodology meets Method

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Abstract

Critical realism (CR) is a useful philosophical framework for social science; however, little guidance is available on which precise methods – including methods of data collection, coding, and analysis – are best suited to applied CR research. This article provides a concrete example of applied qualitative research using CR as a philosophical and methodological framework. Drawing examples from a study of Canadian farm women's experiences with agricultural policy, I suggest a flexible deductive process of coding and data analysis that is consistent with CR ontology and epistemology. The paper follows the typical stages of qualitative research while demonstrating the application of methods informed by CR at each stage. Important considerations CR ontology and epistemology raise, such as the use of existing theory and critical engagement with participants' knowledge and experience, are discussed throughout. Ultimately, I identify two key causal mechanisms shaping the lives of farm women and suggest a future

direction for feminist political economy theory to more effectively analyze women's work in agricultural contexts.

Introduction

Over the past few decades Critical Realism (CR) has gained popularity as a philosophical framework for social scientific research. Emerging out of the positivist/constructivist 'paradigm wars' of the 1980s (Denzin & Lincoln, 2011), CR uses components of both approaches to provide a detailed account of ontology and epistemology, making CR a comprehensive philosophy of science (Brown, Fleetwood, & Roberts, 2002). The CR search for causation helps researchers to explain social events and suggest practical policy recommendations to address social problems.

Despite CR's explanatory strength, some researchers have lamented the 'lack of methodological development' on the application of CR in empirical research (Yeung, 1997, p. 52; see also Oliver, 2012). Roy Bhaskar (2014), from whose work CR originated during the 1970s, recently noted the dearth of texts on applied CR and stated that, 'if CR is to be "serious," it must be applicable' (p. v). Ackroyd and Karlsson (2014) noted the 'serious lack of appealing and accessible material on CR-informed methodology to set those new to these ideas off on a path to accomplish interesting and insightful research' (p. 45).

Indeed, much of the literature on CR can be classified into one of two categories: (1) high-level philosophy of science and theory, or (2) reports on empirical research meant to explain social problems or inform policy, and which therefore stop short of providing a detailed description of their methods. Few authors have demonstrated how

CR ontology and epistemology informed their data collection (for notable exceptions on this see Edwards, Mahoney, & Vincent, 2014; Parr, 2013) and data analysis (e.g., coding). Few authors demonstrate how CR ultimately contributed to their findings. As a result, qualitative researchers hoping to conduct CR research may find themselves without methodological guidelines to help ensure reliability throughout the research process (Morse, Barrett, Mayan, Olson, & Spiers, 2008).

This article discusses the application of CR in a qualitative research project. The purpose is to provide a concrete and detailed exemplar for researchers wishing to employ CR in their own work, while examining some methodological implications of CR for qualitative research. The research project involved 30 in-depth interviews with Canadian farm women to examine how they are affected by, and respond to, major changes in agricultural policy. After presenting some background to CR, the study, and the methods used, I describe in detail how CR informed the data analysis. Although some existing research promotes grounded theory methods for CR research (e.g., Oliver, 2012; Redman-MacLaren & Mills, 2015; Yeung, 1997), I suggest instead a flexible deductive approach which, I argue, is more consistent with CR ontology and epistemology.

CR analysis ultimately relies on a strategy of inference called ‘retroduction’; however, existing descriptions of retroduction are abstract at best. I describe the process of conducting retroduction using practical examples. I also illustrate how the process led to the identification of two causal mechanisms driving current trends in Canadian agriculture and affecting the lives of prairie farm women.

Critical realist ontology and epistemology

Critical Realism emerged in the 1970s and 80s through the work of Bhaskar. It was further discussed and elaborated by critical realists such as Andrew Sayer (1992), Margaret Archer (e.g., 1995), Andrew Collier (e.g., 1994), and Tony Lawson (e.g., 1997). CR originated as a scientific alternative to both positivism and constructivism (Denzin & Lincoln, 2011), but draws elements from both methodological strains in its account of ontology and epistemology. As a philosophy of science (Brown et al., 2002; Nielsen, 2002), CR functions as a general methodological framework for research but is not associated with any particular set of methods.

One of the most important tenets of CR is that ontology (i.e., what is real, the nature of reality) is not reducible to epistemology (i.e., our knowledge of reality). Human knowledge captures only a small part of a deeper and vaster reality. In this respect, CR deviates from both positivism and constructivism. Bhaskar (1998) critiqued positivism for promoting ‘the epistemic fallacy’ (p. 27) – that is, the problematic reduction of ontology to epistemology, or the limitation of ‘reality’ to what can be empirically known (e.g., through scientific experiments). The same critique applies to constructivist perspectives that view reality as entirely constructed through and within human knowledge or discourse. Despite the seeming opposition between the constructivist and positivist perspectives, each reduces reality to human knowledge, whether that knowledge acts as lens or container for reality.

In contrast, CR treats the world as theory-laden, but not theory-determined. CR does not deny that there is a real social world we can attempt to understand or access through philosophy and social science (Danermark, Ekström, Jakobsen, & Karlsson, 2002), but some knowledge can be closer to reality than other knowledge. Critical realists

can gain knowledge ‘in terms of theories, which can be more or less truthlike’ (Danermark et al., 2002, p. 10). The theories that help us get closer to reality, i.e., that help us identify causal mechanisms driving social events, activities, or phenomena, are selected and formed using rational judgment of these social events (Archer, Bhaskar, Collier, Lawson, & Norrie, 1998, p. xi). The ability to engage in explanation and causal analysis (rather than engaging in thick empirical description of a given context) makes CR useful for analyzing social problems and suggesting solutions for social change.

In CR ontology, reality is stratified into three levels. The first is the *empirical* level, which is the realm of events as we experience them. At this level, events or objects can be measured empirically and are often explained through ‘common sense’, but these events are always mediated through the filter of human experience and interpretation. This is the transitive level of reality, where social ideas, meanings, decisions, and actions occur – but, importantly, these can be causal. The middle level consists of the *actual*. At this level, there is no filter of human experience. Events occur whether or not we experience or interpret them, and these true occurrences are often different from what is observed at the empirical level (Danermark et al., 2002, p. 20). Finally, the third level is the *real*. At this level causal structures, or ‘causal mechanisms’, exist. These are the inherent properties in an object or structure that act as causal forces to produce events (i.e., those appearing at the empirical level). It is the primary goal of CR to explain social events through reference to these causal mechanisms and the effects they can have throughout the three-layered ‘iceberg’ of reality (see Figure 1).

The iceberg metaphor (Figure 1) is not meant to suggest that any one level is more or less ‘real,’ or that the levels do not interact. Indeed, all levels of the iceberg are

part of the same entity or, here, the same reality. The metaphor is meant to illustrate the CR ontology and epistemology as it relates to human knowledge of reality, to illustrate in graphic form the limitations of the epistemic fallacy. As Bhaskar (1979) pointed out, unlike the natural world, social structures are in fact activity-dependent. In other words, causal mechanisms ‘exist only in virtue of the activities they govern and cannot be empirically identified independently of them’ (p. 48). This means that causal mechanisms are social products that can ultimately be understood through – and indeed, that *exist within* – phenomena at the empirical level (e.g., human actions and ideas that are generated by these mechanisms), making these phenomena relevant for scientific investigation.

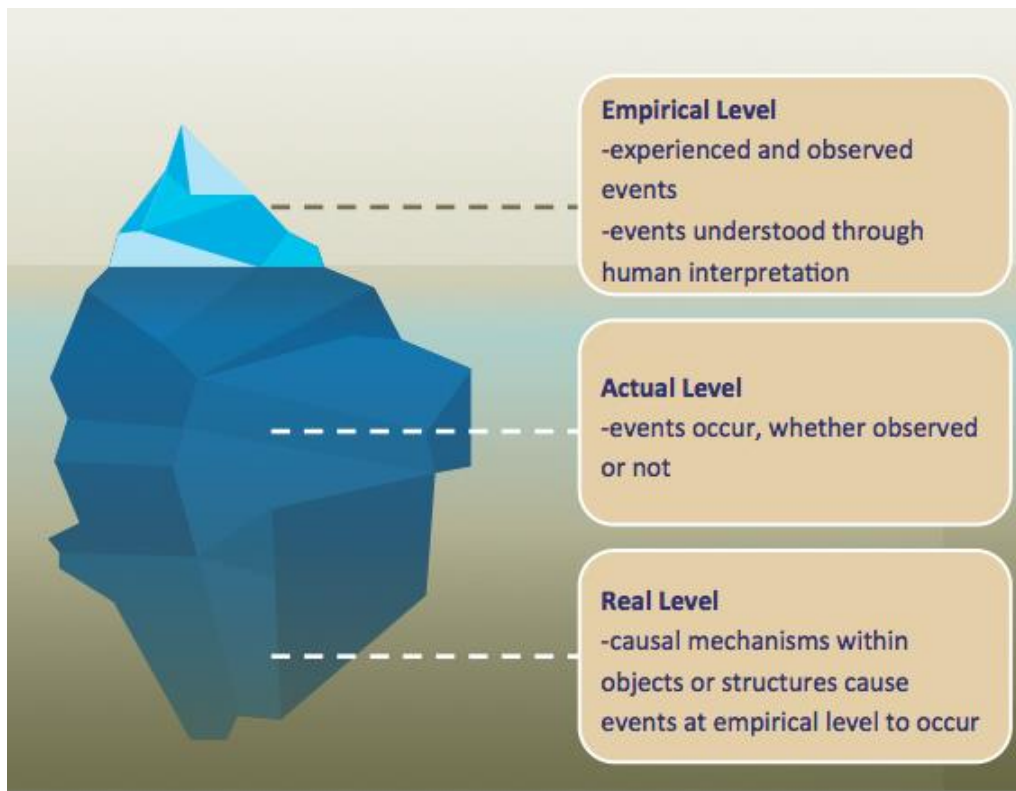


Figure 1. An iceberg metaphor for CR ontology and epistemology

All social structures possess causal powers and liabilities. These are ‘potentialities’ inherent in an object or structure that enable or constrain it from acting in certain ways (Psillos, 2007). Conditions in the open social world can prevent or facilitate the actualization of a structure’s causal power, meaning it may or may not have an observable impact at the empirical level. For this reason, the process of retrodiction investigates particular social conditions under which a causal mechanism takes effect in the world.

Background to the Saskatchewan Farm Women Study

The Saskatchewan Farm Women Study (SFWS) was a qualitative project to examine the social and gendered effects of major policy change. The project examined how farm women in the Canadian prairie province of Saskatchewan are affected by major changes in agricultural policy and how they respond to these changes. Little has been written about the gendered effects of agricultural policy in Canada (for a notable exception see Roppel, Desmarais, & Martz, 2006). I examined two major policy changes that have dramatically affected the economic and social conditions of rural Saskatchewan: first, the elimination of an extremely popular transport support programme for grain producers known colloquially as the ‘Crow Rate’; and second, the 1990 introduction of plant breeders’ rights (PBR) legislation, a type of intellectual property right on seed varieties. The Crow elimination is an example of policy deregulation that allowed Canadian railway companies to dramatically increase their profit margins. In contrast, PBR exemplifies policy ‘re-regulation’—i.e., the re-orientation of policy toward a more corporatized and profit-oriented regime. Both deregulation and re-regulation are features of a neoliberal policy paradigm (Harvey, 2005; Springer, 2013).

The study data included 30 in-depth interviews with farm women throughout the geographically large and rural province of Saskatchewan, as well as three background interviews with agricultural leaders. Participant and farm demographics generally reflected the family farm population of the province. With only two exceptions, all participants were currently farming with a male partner, which provided insight into gender relations on the farm. The project received ethical approval from the University of Regina Research Ethics Board. Further details on the project as they relate to CR have been integrated throughout the following discussion.

Methodology meets method: Applying CR in the Saskatchewan Farm Women Study

The process of CR analysis is not necessarily linear; nevertheless, CR involves several key steps: identification of demi-regularities, abduction (also known as theoretical redescription), and retroduction. In the sections below, I describe my process of doing CR research from beginning to end, following the typical trajectory of a qualitative research project. The various steps in CR analysis are identified throughout the process and concrete examples are provided.

Defining the research question and the role of theory in CR

Like many other researchers, critical realists typically begin with a particular problem or question, which has been guided by theory. Indeed, Bhaskar (1979) acknowledged the distinct but complementary importance of philosophy and empirical social science, with the former setting the parameters of possibility for latter, which examines the substantive operation of structures. Bhaskar (1979) therefore condoned the use of existing theory as a starting point for empirical research: ‘Once a hypothesis about a generative structure has been produced in social science it can be tested quite empirically, although not

necessarily quantitatively' (p. 62). However, existing theories may not necessarily reflect reality accurately, and some theories may be more correct than others. We must, according to Bhaskar (1979), 'avoid any commitment to the content of specific theories and recognise the conditional nature of all its results' (p. 6). For this reason, initial theories must be treated as just that: initial theories. The initial theory facilitates a deeper analysis that can support, elaborate, or deny that theory to help build a new and more accurate explanation of reality.

The SFWS was prompted by existing research about farm women, which showed notable trends in Canadian farm women's work patterns over the past few decades. For example, farm women's participation in off-farm employment has increased dramatically over the past fifty years, from 20% of farm women working off the farm in 1968 (Rioux, 1969), to 48% in 2010 (Statistics Canada, 2011). Existing comparative research also shows that farm women are engaging in fieldwork at the highest rates in the past 30 years (Martz, 2006). In addition to off-farm and on-farm work, women also continue to do the majority of domestic and caregiving work in farm households (Jaffe & Blakley, 1999; Kubik, 2004, 2005; Martz, 2006).

Existing explanations suggest that rising financial pressure on family farms has caused more dependence on farm women's labour (Kubik, 2004, 2005). A parallel stream of research suggests that family farm finances have been dramatically affected by the current neoliberal paradigm in Canadian agricultural policy, which has brought cuts to farm support programmes like the Crow while increasing competition from multinational corporations at all stages of the food chain (Epp & Whitson, 2001; Kuyek, 2007; Roppel et al., 2006). Although research exists on both topics separately, there is little research

that draws a clear *causal* connection between the changing political-economic context of family farming and the changes to farm women's work. CR offered a way to investigate the potential links.

The research was initially guided by feminist political economy (FPE) theory. But, in keeping with CR epistemology I understood that I might ultimately support, modify, or reject this theoretical framework to better explain the particular context of Saskatchewan farm women's experiences (Bhaskar, 1979). Originating from socialist feminist analysis on the value of women's household work, FPE now allows us to look beyond household labour relations to examine the gender dimensions of political-economic structures (e.g., Bakker & Gill, 2008; Bezanson & Luxton, 2006; Braedley & Luxton, 2010; Brodie, 2008; Vosko, 2003).

Data collection

My process of CR research began with the empirical data. Events are observed at the empirical level using two types of data: extensive (i.e., data on widespread trends, such as statistical data) and intensive (i.e., in-depth interpretive data, as obtained through interviews or focus groups for example). Both help us to identify demi-regularities for further analysis. In the farm women study, extensive data were drawn from the 2011 Canadian Census of Agriculture (Statistics Canada, 2011) and were used to identify trends, such as changes in farm size and income.

As a critical feminist research project focused on women's lives, the study emphasized intensive data collection (Parr, 2013). The intensive data collection phase started with three background interviews with agricultural leaders, followed by 30 in-

person interviews with farm women across the Canadian prairie province of Saskatchewan. Like Parr (2013), I selected a primarily semi-structured interview format, ensuring the flexibility to explore and update the existing literature on farm women while still allowing new ideas to emerge. However, the interview also included several quantitative rating-scale questions. These quantitative questions allowed me to get a sense of relative importance on some key issues, such as farm women's motivations for working off-farm. All interviews were recorded and transcribed verbatim.

Data coding and identification of demi-regularities

In keeping with CR ontology, data analysis began with the search for 'demi-regularities' at the empirical level of reality. Although CR acknowledges that social meanings, ideas, and decisions can have causal impacts in the world, these social objects do not follow a conception of causal law and the deterministic regularity of Humean constant conjunction. Prediction – along the lines of 'whenever event x, then event y' – is simply not possible because the social world consists of open systems, in which any number of occurrences and events can overlap and interact and in which people can learn and change (Brown et al., 2002, p. 5; Danermark et al., 2002). As such, CR looks for *tendencies*, not laws (Danermark et al., 2002, p. 70). These tendencies can be seen, for example, in rough trends or broken patterns in empirical data. Critical realists call these 'demi-regularities'. Demi-regularities can be effectively identified through qualitative data coding.

The lack of literature on applied CR created a challenge for coding. Even in the empirical literature on CR, references to qualitative data processing are vague at best, describing the process in such nondescript terms as: 'intensive grounding process in

which concepts emerged' (Yeung, 1997, p. 69). Data processing is important in qualitative research, including CR, for which it provides insight into empirical demi-regularities and represents the beginning of abduction and retroduction.

Some critical realists have employed a grounded theory approach to data coding and analysis (e.g., Maxwell, 2012; Oliver, 2012; Yeung, 1997). However, there are several reasons why grounded theory is not ideal for a CR study. First, the two approaches engage with existing theory in very different ways. Although grounded theory can be generally guided by existing theory or literature (i.e., substantive theory) on a topic (Glaser & Strauss, 1967), it avoids active engagement with existing theory during the analysis process. For example, grounded theorists usually inductively code each line of text to gradually develop progressively higher-level theories that are grounded in the data, rather than in concepts drawn from elsewhere (Corbin & Strauss, 2008). Conversely, in CR 'active thought experimentation is needed before research even begins' (Hart, New, & Freeman, 2004, p. 166), and CR aims to find the best explanation of reality through engagement with existing (fallible) theories about that reality.

Secondly and relatedly, the inferential processes associated with grounded theory are also primarily inductive whereas CR uses abduction and retroduction. Grounded theory is data-driven while CR uses a more theory- and researcher-driven analytical process. Although grounded theory is not necessarily purely empiricist and does involve theoretical abstraction from data (Suddaby, 2006), its relationship to data more closely reflects an empiricist approach than CR. Oliver (2012) argued that, due to recent developments in grounded theory such as Charmaz's (2006) 'sensitizing concepts,' grounded theory is 'capable of handling the preconceived analytical categories' valued by

critical realists (Oliver, 2012, p. 378). Nonetheless, because existing theory is such an important part of CR analysis it is difficult to justify the use of an approach like grounded theory, which was founded on the intentional avoidance of existing theory in order to build new theories.

For the SFWS, I used a primarily deductive yet flexible (i.e., ‘directed’) coding process (Hsieh & Shannon, 2005) that drew on existing theory and literature. A list of codes was drawn from the literature review, theoretical framework, and key CR concepts; however, these codes were changed, eliminated, and supplemented with new codes during the process until every piece of text was coded (Gilgun, 2011). In this way, the deductive codes were treated as a way to reformulate the existing model or theory from which they were drawn (Gilgun, 2011).

I began with 32 provisional codes of two types described by Maxwell (2012): organizational and theoretical. Organizational codes are simply topic-based ‘bins’ into which information is sorted, while theoretical codes are derived from prior theory (Maxwell, 2012). Saldaña (2013) warned against a rigid approach to coding, pointing out that ‘your preconceptions of what to expect...may distort your objective and even interpretive observations of what is “really” happening there’ (p. 146). For this reason, ‘provisional’ codes were treated as such, and codes were added, changed, or deleted as the data warranted. Over the course of the coding process, my 32 provisional codes expanded into a total of 198; this reflects the flexibility of the deductive coding process.

The large number of codes was gradually reduced during the second coding cycle, as I re-organized and combined these codes into a conceptual map informed by CR. For example, I re-coded the prominent codes into CR-informed categories like ‘structure’ and

‘agency.’ The CR vision of structure and agency ‘starts from the ontological claim that structure and agency each possess distinct properties and powers in their own right’ (Carter & New, 2004, p. 5). Social structures include relatively enduring (but not permanent) features of the world that often precede and succeed our individual lives, but which human agency can reproduce or transform over time (Archer, 2010; Bhaskar, 1979). Agency, which is shaped but not determined by structures, can consciously or unconsciously shape those social structures (Bhaskar, 1979). Importantly, agency includes our individual values, meanings, and ideas, and these can also shape the world around us (Carter & New, 2004). Thus, a parent code ‘structure:___’ was created, and existing organizational or theoretical codes were re-coded into it in order to identify some possible structures at play. A parent code marked ‘agency: ___’ was used similarly. In addition to this secondary coding, I used NVivo coding queries and tree charts to identify the most dominant codes (i.e., the most commonly coded) and connections between codes.

All codes were considered important; however, the most dominant codes were used as a starting point to identify demi-regularities. One important demi-regularity was found in the way farm women described their roles. With just a few exceptions, the majority of farm women repeatedly described their male partners as the ‘main’ or ‘central’ farmer on the operation. Despite the fact that 14 of 30 claimed ‘farmer’ as at least one of their job titles, the majority still described their actual activities as that of ‘employee,’ ‘go-for,’ or ‘helper.’ The tasks most commonly done by women were: accounting, administration and farm business management, hauling, and driving (particularly to move farm machinery or workers). Women were less likely to be directly

involved in fieldwork or livestock handling than men, although they still performed these tasks. This finding on the marginalization of women's farm roles as 'helping' was an important demi-regularity that would later inform my analysis.

Another particularly important demi-regularity resulted from the quantitative rating-scale question. Farm women with off-farm employment were asked to rate their motivations for taking this employment. They used a scale where 0='not at all a factor' and 6='the most important factor'. The results are shown in Figure 2. Rather than showing that farm women are working off-farm to support the farm operation financially (supporting the farm was, in fact, most often rated a '0'), the data showed that farm women's strongest motivation for working off-farm was to advance their own personal goals or for self-fulfillment. Money for household needs, such as renovations or children's education, was the second strongest motivator, indicating that financial pressures do play a role in farm women's off-farm work, although these are not the strongest motivator. Furthermore, when asked about their ideal work arrangements only four of the 20 participants who worked off-farm stated that they would quit their off-farm work if they could.

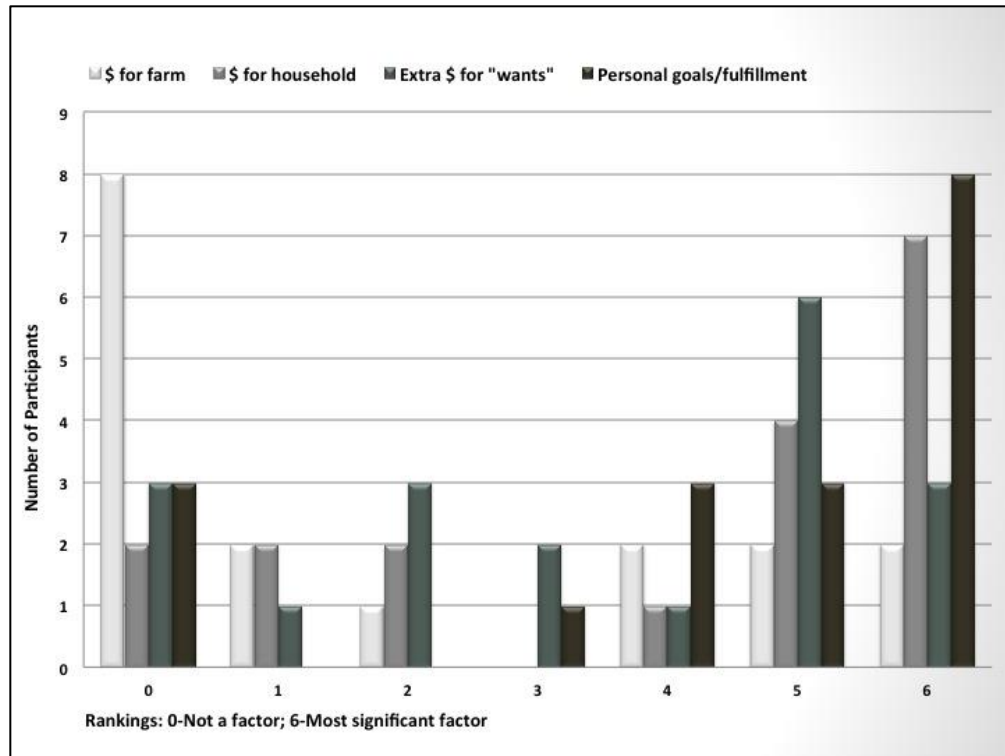


Figure 2. Farm Women's Reasons for Taking Off-Farm Work, Distribution of Scores

The statistical (i.e., extensive) data showed a striking demi-regularity about the agricultural context itself. Farms in the Canadian prairies are expanding in size at a historically unprecedented rate. Between 2006 and 2011, Saskatchewan reported the largest increase in average farm size in the country at 15% (Statistics Canada, 2012); this growth rate is higher even than the post-World War II boom. The interview (i.e., intensive) data also indicated the importance of this trend: farm women often spoke about the growing tension and competition for land as family farms grow larger to make a profit.

In addition, farm women reported a growing loss of control by family farmers over the conditions of production. The women were concerned about loss of control over seed use due to patenting and PBR legislation. For many participants the loss of control

also extended more broadly to other political-economic factors affecting the family farm, such as rising costs for inputs (e.g., seed and machinery). Many attributed these challenges to an unnamed entity – a ubiquitous ‘they’ mentioned throughout the interviews – with excessive power over economic conditions. When prompted on this, only a few participants directly linked their loss of market power to the profit imperative for large agri-corporations entering the agricultural sector. Many expressed uncertainty about what was causing their loss of economic control. Others blamed the government for failing to control the price of agricultural inputs.

Due to CR ontology and epistemology (there is a ‘real’ world and it is theory-laden, not theory-determined), all explanations of reality are treated as fallible (Bhaskar, 1979), including the explanations provided by research participants, theorists, and scientists. This ontological departure of CR from interpretivism becomes particularly useful for change-oriented research in which participants offer competing explanations of a phenomenon and some must be taken as more accurate than others. For the same reason, CR epistemology may also be seen as disempowering for participants (i.e., through the implication that ‘the scientist knows best’). However, it should not be assumed that scientific explanations are always more accurate than experiential explanations—indeed, all are potentially fallible, and participants’ experiences and explanations of a phenomenon may in fact prove most accurate in explaining the reality. In qualitative CR research, participants’ experiences and understandings can challenge existing scientific knowledge and theory (Redman-MacLaren & Mills, 2015). Both of these different outcomes occurred in the SFWS.

As discussed below, through my retroductive analysis I concluded that corporatization is a key causal mechanism driving farmers' loss of control, even though few participants directly identified corporatization a causal factor. Some participants may therefore not agree with my explanation. However, as I will discuss in the next section, in other ways the farm women's own explanations of their work choices posed an important challenge to prevailing scholarly explanations about their lives; in this sense, I argue that participants' explanations offered a closer perspective to reality than some existing theory.

Data analysis through abduction and retroduction

Abduction (or 'theoretical redescription')

After the main empirical findings (demi-regularities) of the research had been identified through coding, the next step was the process of abduction—also known as theoretical redescription—in which empirical data are re-described using theoretical concepts.

Abduction has been defined as a process of 'inference or thought operation, implying that a particular phenomenon or event is interpreted from a set of general ideas or concepts' (Danermark et al., 2002, p. 205). Abduction raises the level of theoretical engagement beyond thick description of the empirical entities, but with an acknowledgement that the chosen theory is fallible.

A key empirical finding in the research was motivations for farm women's work. Women in the SFWS were working in large part for their own goals and fulfillment – a finding that challenged existing explanations in the literature. It is possible to explain farm women's off-farm work as a straightforward matter of choice; however, to do so would be an epistemic fallacy, a failure to consider deeper causal structures, particularly

in light of other demi-regularities such as the loss of control many participants spoke about. FPE theory reminds us of important political and economic conditions structuring work patterns in gendered ways (Luxton, 2006). This theoretical perspective points to causal mechanisms that go beyond individual choice and shape agency in particular ways. Recent work in FPE has examined the gendered effects of neoliberal capitalism (Bakker, 2007; Bezanson & Luxton, 2006; Braedley & Luxton, 2010). In the case of Canadian agriculture, it is important to situate farm women's work within the macro-level context of neoliberal changes in agricultural policy such as the Crow elimination and the introduction of PBR. Although the women's own explanations of their work motivations were important and indicative of the 'real,' existing theory on the interaction of gender with the dominant neoliberal political-economic context allowed me to look beyond "choice" to engage with other causal mechanisms that contributed to the second key empirical finding: loss of control.

Retroduction

The final stage of critical realist analysis, retroduction, focuses on causal mechanisms and conditions. The goal of retroduction is to identify the necessary contextual conditions for a particular causal mechanism to take effect and to result in the empirical trends observed. Retroduction moves from 'the manifest phenomena of social life, as conceptualized in the experience of the social agents concerned, to the essential relations that necessitate them' (Bhaskar, 1979, p. 32). As a reasoning process that moves from concrete to abstract and back again, retroduction is the 'central mode of inference' in CR (Lawson, 1998, p. 156). Throughout the section below, I have *italicized* critical CR concepts to clearly illustrate the operation of these concepts.

In the SFWS, retroduction was used to investigate the causal mechanisms and conditions affecting farm women's labour patterns. After identifying demi-regularities (i.e., women's motivations for off-farm work and the loss of control theme), it was important to examine what social conditions cause these trends to appear as they do. I had begun the study with several expectations drawn from existing theory and research: first, I expected that farm women's increasing off-farm work was caused by increasing financial pressure on the farm; second, I expected that major policy changes were a causal mechanism behind this financial pressure. I was surprised to find that my CR analysis resulted in very different findings. Rather than policy, the two most significant causal mechanisms were gender ideology and corporatization.

As discussed previously, many of the farm women reported a general sense of disconnection from the farm. As 'employees' or 'helpers,' many of the women did not experience the same level of control and decision-making over the daily farm operation as their male partners. For this reason, most were fulfilling their own goals off the farm. At the same time, many farms were becoming increasingly dependent on farm women's 'helping' work as farms grow larger in size. A common refrain from the farm women interviewed was, 'I am the hired man,' a statement that reflects many farm women's position as workers but not decision-makers.

Under many circumstances, farm men's disproportionate control over the farm was a *power* for farm men and a *liability* for farm women. At the same time, family farms in Canada are experiencing a period of rapid change and uncertainty. Farmers are growing their operations ever larger to remain economically competitive in a corporatized environment. Large multinational corporations are claiming larger profit

returns, often from vertically integrated enterprises spread throughout the seed breeding, processing, and export sectors. Farm supports and subsidies like the ‘Crow’ have been cut while new legislation, such as PBR and seed patenting, further reduces farmers’ control over production. As farmers in general lose control over daily production decisions, farm women, who are already somewhat detached due to gender roles, experience a ‘double detachment’ from farm control (Fletcher, 2013).

Many farm women described how their male partners are more negatively affected by farm crisis. During hard times on the farm, it was the ‘main farmers’ who were more likely to watch as crops failed. This is further supported by the fact that the two farm women who were the main or sole operators on their farms both reported higher levels of stress associated with farm issues, to the point that one had relied on antidepressants during a particularly hard year. A CR analysis therefore shows that, under certain intervening conditions, the *power* of farm control becomes *actualized* as a *liability*. Depending on the conditions, this power can manifest differently at the empirical level.

But, how do we identify the deeper structures from which these powers and liabilities originate? The goal of retroduction is to constantly move between empirical and deeper levels of reality to fully understand the phenomenon under study. Understanding that farm women’s lives are structured by a rigid gender ideology that positions their farm contributions as peripheral, I concluded that gender ideology is a key *causal mechanism* shaping farm women’s work patterns. The CR ontology is particularly important here. As New (2005) argued in her CR approach to sex and gender, gender ideology exists in the transitive realm of ideas and meanings. Gender ideology references

physical bodies in the intransitive realm, but is not reducible to them (New, 2005). Indeed, in CR, ideas and knowledge in the transitive world can be real and causal: people's knowledge, reasons or motivations for doing things can have a very real effect on the intransitive world. CR treats 'the ideas and meanings held by individuals – their concepts, beliefs, feelings, intentions, and so on – as equally real to physical objects and processes' (Maxwell, 2012, p. viii). On the prairie family farm, a particular form of gender ideology remains dominant and has the capacity to influence – and simultaneously naturalize – people's roles and actions along gendered lines. In keeping with the process of retroduction, this particular gender ideology now becomes subject to further analysis and explanation, which (although beyond the scope of this particular article) will likely reveal other historical generative mechanisms that produced this particular ideological structure (Archer, 2010; Bhaskar, 1979).

Gender ideology explained farm women's peripheral position on the farm, but it did not explain the phenomenon of their 'double detachment' as farmers in general lose control. In accordance with FPE theory, it is necessary to examine gender relations within this broader political-economic context. Moving back to the empirical level of reality, I used an NVivo-based analysis to note the particular dominance of three codes on the topic of agricultural issues: 'Corporations,' 'farm size,' and 'lack of control' (see Table 1). Through engagement with existing research and the observations of a few participants who discussed corporations' responsibility for farmers' lack of economic control, I was able to attribute the farm size issue to the deeper structural issue of corporatization.

Corporations were the ubiquitous 'they' mentioned by so many participants. As large multinational corporations take a larger share of agricultural profits (Fletcher,

2013), family farmers become more affected by the ‘cost-price squeeze.’ Corporatization is a key causal mechanism behind farmers’ lack of control and is their main motivation for growing the farm to stay economically viable. Even though corporatization could be further reduced to a deeper and more basic causal mechanism – that is, capitalism – I focused on corporatization as a specific structural mechanism operating under particular conditions (in this case, an advanced capitalist system with a neoliberal policy regime). Following the principles of retroduction, corporatization is the condition required for the causal mechanism to become actualized and thus to result in the empirical conditions observed. In other political-economic conditions, such as highly regulated capitalist regimes with a strongly interventionist orientation to agricultural policy, conditions may be sufficiently different and could produce a very different manifestation of capitalism-as-mechanism than seen in the Canadian agricultural context.

As mentioned previously, few of the farm women had explicitly identified corporatization as causing their loss of economic control, but many of their concerns (e.g., the cost of farm inputs) were related to this causal structure. This became clear as I reviewed the most dominant codes (Table 1). My conclusion about corporatization represents the CR practice of rational judgment, wherein the researcher may need to elaborate upon (or deviate from) participants’ own interpretations in order to ‘provide fuller or more adequate interpretations’ of reality (Parr, 2013, p. 10).

Code	# of Participants Mentioning (n=33)	# of Mentions
Corporations	31	208
Farm size	27	150
Lack of control	26	152
Machinery	23	93
Family farming	22	67

Table 1. The five most common codes on agricultural issues, by number of participants mentioning and number of mentions.

How do these findings ultimately inform existing theory? As discussed previously, a key outcome of successful retrodution is to modify, support, or reject existing theories to provide the most accurate explanation of reality. The analysis has shown the usefulness of FPE theory for examining the macro-level political and economic conditions affecting farm women's work. FPE suggests the need to look further than simple 'choice' as an explanation. However, FPE theory has tended to focus more heavily on political and economic structures as opposed to agential responses to these structures. In contrast, CR's clear distinction between structure and agency prevents the collapsing of one into the other. This conceptual distinction between structure and agency is useful for challenging the dominant conceptualization that women's off-farm work is mainly done to support the farm (i.e., that farm women's actions are strongly governed, even determined, by structure). Although farm women's wages do offset household expenses when farm revenue is insufficient—a situation resulting from stagnant farm incomes as well as rising expectations for farm families' standards of living—the understanding of farm women's agency as a *power* is also important. Farm women

enjoyed their off-farm work, and this reality should not be denied in favour of overly structural (and therefore agency-stripping) discourses.

CR allows us to understand agency in relation to the causal mechanisms of gender ideology and corporatization, which cause agency to manifest as it does in this context. As a source of satisfaction and self-fulfillment, women's off-farm work remains an agential response to a highly masculinized farm context wherein women are positioned as 'helpers,' not decision makers (gender ideology). As farmers in general lose control over the conditions of production, women seek opportunities to fulfill their own goals elsewhere. As one farm woman put it, 'We [women] have other things that we can do with our lives and if your thing to do with your life is simply farming, [especially] more complicated farming...then I think you can weigh yourself down more.' Within the context of double detachment, itself the product of gender ideology and corporatization, women are making choices: they 'self-consciously transform their social conditions of existence (the social structure) so as to maximize the possibilities for the development and spontaneous exercise' of their powers (Bhaskar, 1979, p .47).

While farm women's off-farm work adds another dimension to their identity beyond being a farm 'helper' or 'hired man,' it may also reinforce the masculinization of agriculture as women become less involved in farming (Clarke & Alston, forthcoming). While some social structures are challenged through these agential responses, other structures are reinforced (Archer, 2010). The findings emphasize the importance of examining both structure and agency in FPE research.

Conclusion

This article has demonstrated applied empirical research using CR as a philosophical and methodological framework. Although the literature contains examples of applied empirical research using CR, few have explicitly discussed their methods of data analysis (e.g., coding) or described how CR concepts resulted in their findings. The purpose of the current article has been to provide an example of applied CR analysis following the typical trajectory of a qualitative research project. This is not to suggest that there is a single method best suited to CR research; rather, my aim is to suggest one of many possible approaches to conducting empirical research in a CR framework (for a typology of possible approaches, see Akroyd & Karlsson, 2014). The best methods for each individual CR study should be determined by its guiding theoretical and conceptual framework, which is treated as fallible and subjected to immanent critique throughout the process (O'Mahoney & Vincent, 2014). Despite the diversity of methods 'permitted' in CR, and although several CR researchers have relied upon grounded theory as a methodological framework, I have argued that grounded theory techniques are not necessarily ideal for CR due to substantial differences in how each engages with existing theory.

The research project discussed in this article examined how major changes in agricultural policy affect farm women's work. Retroductive analysis revealed two deep causal mechanisms shaping the lives of prairie farm women: gender ideology at the household and farm level, and corporatization in Canadian agriculture more generally. I suggest a future emphasis on structure/agency interplay in FPE theory to better value farm women's own understandings of their work motivations while still critically engaging with political-economic structures that shape this agency.

Critical realists seek to explain and critique social conditions. This makes it possible – indeed, desirable – to produce concrete policy recommendations and definitive claims for action on social problems. Although these recommendations will be fallible (or could have unexpected results under various social conditions), critical realists base their recommendations on the identified tendencies and causal mechanisms. The research project produced a number of policy recommendations, which were shared with policymakers and political representatives. For example, at a high level, I recommend agricultural policies that ensure farmers’ control over seed use. At the micro-level, I suggest the need for farm stress services and mental health supports that are attentive to the different gendered roles of farm men and women or, in CR terms, their different ‘powers’ and ‘liabilities’. Overall, the current discussion makes a case for the usefulness of applied CR analysis while providing a concrete methodological example for future research.

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