Plotting Directionality on Positional Maps: A Methodological Consideration for Situational Analysis

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Abstract
In this article, we aim to expand situational analysis (SA), oriented by complex adaptive systems (CAS), by adding the dimension of directionality over time to positional maps. This addition furthers the analytic utility of SA and can aid researchers in identifying areas for transformative action regarding social justice and health equity issues. Adding directionality over time to positional maps pushes researchers to explore how positions move, evolve, and how they could continue to develop. Analyzing these elements expands the analytic utility of positional maps as researchers abductively analyze explicit connections between theorized antecedents, current conditions, and potential futures within a CAS to understand positional movements. The purpose of this analysis is not as a predictive tool but as a tool in identifying potential actionable areas for interventions while further grounding SA in its Foucauldian and Straussian theoretical roots. We use an ongoing public health project in the Ngorongoro Conservation Area, Tanzania, to demonstrate how a researcher can apply directionality over time to positional maps.

Keywords
methods in qualitative inquiry, grounded theory, constructivist grounded theory, action research, social justice, situational analysis, positional maps, complexity theory, complex adaptive systems, public health research

Introduction
The moral aim of public health is to promote population and community health as a social good that allows members of the population to pursue valuable life needs (MacDonald, 2013). When members are incapable of obtaining valuable life needs due to social stratification, inequities in health result (Shareck, Frohlich, & Poland, 2013). Hence, the aim of public health and public health research is to advance social justice and to reduce health inequities. Yet there is a tradition in public health research largely predicated on linear causal models to examine predetermined variables in relative isolation, failing to account for the nature of the larger system and how health inequities develop and change (Byrne & Callaghan, 2014; Grant & Hood, 2017; Walby, 2007). A challenge of traditional linear research approaches is the varying degrees of uncertainty inherent in adaptive, self-organizing systems that form, shape, and reinforce health inequities (Byrne & Callaghan, 2014; Martin, 2014; Waltner-Toews, 2017). Such approaches fail to attend to the complexities of the studied situation where there are multiple, often conflicting, perspectives, value systems, and Temporal–Spatial Scales (Waltner-Toews, 2017). Therefore, public health researchers are turning toward complexity science as an overarching framework for how we view, understand, and act on issues that shape population and community health as a social good (Byrne & Callaghan, 2014; Salway & Green, 2017).

Adele Clarke’s situational analysis (SA; Clarke, Friese, & Washburn, 2018) is a novel methodology that public health researchers can use to explore public health issues from a complexity science worldview. In using SA, researchers explore and analyze relationality through qualitative mapmaking to better understand a studied situation. Positional maps are one type of analytic mapping strategy SA researchers use to analyze positions held on various issues, highlighting differences and heterogeneities in the data that are often simplified or

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ignored by other methods (Clarke et al., 2018). Such maps, however, are limited in their ability to help imagine a socially just future of improved health equity. By adding directionality over time to positional maps to explore how positions have changed from past, present, and in future outlooks holds significant potential for identifying interventions fostering social justice.

In this article, we offer a theoretically informed methodological consideration enhancing the analytic utility of SA positional maps by pushing researchers to further explore relationality and theorize how changes emerge within a system in order to identify and speculate potential actionable areas for social change. We propose SA data analysis can be furthered by adding directionality over time to positional maps and base our discussion in relevant literature and theory. We begin by briefly describing SA, oriented by complex adaptive systems (CAS), and then illustrate how these adapted positional maps can aid researchers to identify and speculate positional trends and future possibilities that can inform social justice action in an explored situation.

Background

Complexity science, a body of multiple theories and frameworks, shifts our focus from predominantly microlevel or individualism approaches toward wider societal processes through whole systems thinking (Salway & Green, 2017). Exploring an issue from this perspective pushes researchers to consider how an issue is situated within and interacts with the larger system as opposed to examining an issue in relative isolation. Researchers must grapple with the complexities inherent within the studied situation and resist characterizing issues as linear outcomes. By attending to complex systems, researchers are now dealing with nonlinear systems—systems where outcomes are not directly proportional to inputs or changes in the causal elements (Byrne & Callaghan, 2014).

CAS is one framework of complexity science and is a study of problems in adaptive, self-organizing systems not explained by methods of traditional science (Capra, 1996). In using a CAS framework, researchers aim to identify the underlying order beneath the perceived disorder in systems previously thought to be unpredictable (Haigh, 2002) by grappling with the complexity of the system rather than seeking generalizations. To do so, researchers assume nonlinearity and must analyze situations based on relationality.

By assuming nonlinearity, researchers are faced with the concept of “emergence,” a central concept of CAS, which asserts health inequities are formed, shaped, and perpetuated through relationality within a system—they are not designed, rather they emerge through spatio-temporal relationships (Paley & Eva, 2010). Health inequities are thus gestals—heterogeneous combinations of relationships that emerge as greater than the sum of its parts. Therefore, it is difficult and problematic to ascertain individual causative factors as health inequities are dynamic and result from complex relationships and interrelationships within a system. In departing from individual to system discourses, we hope that future health and social justice research will enable public health researchers to attend to and engage with the complexity of situations perpetuating health inequities to make social justice analysis more precise and speculative.

SA and Positional Maps

Developed from grounded theory, SA is a relational and ecological methodology that enables researchers to explore the dense complexities of a situation under study through qualitative mapmaking (Clarke, 2005). SA uses the situation, as opposed to basic social process, as the unit of analysis (Clarke et al., 2018). Building on the work of post-structuralists such as Anselm Strauss and Michel Foucault, SA goes beyond “the knowing subject” by explicitly taking the nonhuman actants into account, thereby including materialities and discourses within the analysis of a studied situation. In doing so, SA emphasizes the broad relational ecologies between human and nonhuman actors with their environmental, structural, institutional, social, sociopolitical, cultural, and historical worlds (Charmaz, 2005; Clarke et al., 2018). Essential to SA is that researchers identify not only the dominant positions held within the studied situation but also seek to identify the marginalized and often neglected positions. Using a series of different mapmaking methodologies as analytical tools, the researcher can analyze discourses, conditions of possibility, practices, and power relations (Clarke et al., 2018). In taking a critical stance of these positions, efforts can be made to locate experiences in larger situational structures so to increase understandings of how these structures operate and determine outcomes (Charmaz, 2005).

Clarke, Friese, and Washburn (2018) assert that epistemology and ontology are closely linked in theory/methods packages where theory and methods are coconstitutive. The epistemological roots of SA are grounded in pragmatist philosophy and symbolic interactionism with materialist constructivist and postmodern framings. Society, reality, and the self are understood to be socially constructed according to social interactionism, which informs pragmatism; thus, pragmatic truths are by extension socially constructed (Charmaz, 2014; Dennis & Martin, 2005). This orientation supports a materialist constructivist framing in that not only do we construct our world through discursive, ideological, and symbolic interactions, but additionally the material world is also constructed, interpreted, and given meaning (Clarke et al., 2018). Therefore, to truly explore a situation, the researcher must go beyond the knowing subject to include the nonhuman, exploring the relationships and interconnections that constitute a situation. We see that using a theory/method package with the epistemological basis of SA, the context is set for understanding a possible “truth” of social phenomenon (Martin, 2014).
Discussion

The Theoretical Perspective: Braiding Together SA and CAS

By applying an overarching CAS framework for SA, researchers are pushed to consider the world in terms of complexity, where heterogeneities and incoherencies are sought out rather than discounted, and relationalities are emphasized within the broader perspective of the system. By engaging with these differences, SA can serve to advance social justice research, which, in the context of public health, means acknowledging and correcting structures that perpetuate inequity between people concerning the social determinants of health. Sensitivity to social justice issues fosters defining latent and explicit processes (Charmaz, 2005).

Positional maps. As a key component of the SA method, positional maps are an innovative analytical tool for discerning and conceptualizing relationships and positions held on key issues in the situation under study (Clarke et al., 2018). Differences, power, contingencies, and multiplicity are foundational to understanding a particular position (Clarke, 2005). Consistent with CAS, creating positional maps pushes researchers to engage with the complexities, incoherencies, and heterogeneities within a given situation by exploring relationships among each element (Clarke, 2005). As researchers aim to represent major positions on positional maps, they must explore the issue from a variety of perspectives, specifically seeking missing positions in the data to inform theoretical sampling (Clarke et al., 2018). Through this process, researchers can develop awareness of social justice issues rooted in context, history, social worlds, and structures and examine qualities of equity, fairness, rights, and legitimacy (Charmaz, 2005). As with all SA mapmaking, the purpose of formulating a positional map is analytical, in this case bearing beyond the discourses in a situation and laying out the underlying positions taken on certain issues.

To create a positional map, the researcher plots positions on a graph, grounded in the data in relation to identified axes of concern. The goal is not a quantitative measure of exactitude but, for illustrative purposes, is an iterative process done throughout the latter part of data collection and analysis (Clarke et al., 2018). The axial elements are important to the research question and are often issues of contention, dissent, or power. Plotted positions are purposefully democratic, and not representative of individuals or groups, but the discursive positions of the issues themselves. In fact, individuals and collectives can simultaneously hold multiple positions, even contradictory ones (Clarke et al., 2018). Through immersion in the data, the researcher becomes aware of the nuances and differences between similar positions. It is up to the researcher to determine when the positions are sufficiently distinct enough to plot a separate point. After labeling the maps, the researcher looks for gaps where positions may be expected and will gather additional data if necessary. Remaining gaps can offer valuable insights when researchers suspect saturation of the data.

Developing just futures: Using positional maps as a social justice tool. Narratives influence how political and public health leaders make decisions (Waltner-Toews, 2017). Injustices are often individualized outcomes of unjust conditions, but because social justice is frequently described in the context of individual equality and fairness, the social and structural dimensions of justice are minimized (Boutain, 2012). Positional mapping can examine systems that have shifted from promoting oppression and privilege to promoting equity holding a social justice orientation (Boutain, 2012; Clarke et al., 2018). By examining the trajectory from historical positions to current positions (directionality over time), one may be able to surmise why and how this movement was possible and what positions carry power. In this account, directionality in positional maps has the potential to be a tool for understanding processes (Byrne, 2010), which is not only important for advancing social justice by learning probable points of leverage but is also key to unlocking and understanding any CAS.

Adding directionality over time to positional maps. The future is a time open to influence and is important in shaping the present (Byrne & Callaghan, 2014). The concept of “tomorrow” is an imagined future that agents construct and act in response to, even though it may never be realized as envisioned (Byrne & Callaghan, 2014). In this sense, the present is influenced by potential futures just as it is by constructed reflections of the past. In CAS, one of the most difficult challenges is in determining causality for maintaining or transforming the trajectory of systems (Byrne, 2010).

Positions emerge as a quality of movement (Clarke, 2005; Massumi, 2002). Just as CAS self-organize and evolve, positions too change and evolve, with neither the system nor positions ever static or at equilibrium (Byrne & Callaghan, 2014). Clarke et al. (2018) point to the work of Michel Foucault in the analysis of discourses to expand the domains of social life explored in SA to include current and historical understandings of a situation. However, they do not offer guidance for attending to speculative or idealized positions, which are common in addressing issues of social change and advancement. They do explain the difficulty in grasping the discursive elements active in the situations under study because these elements are ephemeral. Drawing on the Foucauldian roots of SA, we argue, as the researcher creates a positional map, they must consider the movement of the positions—how has a position evolved? And how could it continue to develop? In doing so, researchers are pushed to consider possible conditions that constitute potential pathways into the future and thereby explicating possibilities for change.

Mechanism-based explanations detail the means and interactions that lead from one position to the other. This is understood as a spatio-temporal relationship rather than as a
statistical relationship between variables (Paley & Eva, 2010). Therefore, we argue that adding the dimension of directionality over time to positional maps in SA can push the analytic utility of positional maps, enabling researchers to construct a mechanism-based explanation of how change has evolved. Furthermore, the researcher may be able to speculate how current relationships might affect potential future positions. This is essentially an extension of abductive reasoning. By intentionally considering the temporal/directional relationship between positions and imagined futures as discussed within the data, the researcher is led to ask how current relationships among human and nonhuman actors could, potentially, influence actual future positions. The purpose is not for prediction, instead for analytical opportunity seeking.

Byrne and Callaghan (2014) assert that in a CAS, it is not a matter of what will happen, rather it is a matter of what will be made to happen. Since humans have agency and self-determine their actions based on past, present, and imagined futures, it is essential to consider potential future positions within a situation as they will be influential. Using positional maps to identify how certain positions evolved and to speculate how they might continue to evolve, researchers might identify opportunities for tangible transformative action to improve health and social justice.

Exemplar

The Practical Application: Applying Directionality Over Time to Positional Maps

To illustrate plotting directionality on positional maps, we refer to ongoing work by one coauthor in the Ngorongoro Conservation Area (NCA), Tanzania. Beginning as an environmental scan to inform program planning and evaluation, this project has since expanded to include a community-based intervention. The coauthor and colleagues collected qualitative and quantitative data centering on food and economic insecurity in an indigenous Maasai community living within a cultivation-restricted geopolitical environment (unpublished data). Although the coauthor and collaborators have yet to publish their research, their positional maps serve as a useful case study here to illustrate how the addition of directionality over time to positional maps can enhance SA analysis and foster socially just interventions.

Data collection. To begin with data collection in SA, researchers use their substantive knowledge of the topic area as a vantage point and begin by identifying what kinds of data they need and the methods that will yield such data. Researchers can use a variety of methods, understanding that data are coconstructed through interactions (Clarke et al., 2018). Being that this work is social justice–oriented, and our intention is to inform, promote, and support development programs that improve food security, health, and equity, data collection is needed to include past, present, and future-oriented perspectives. Collecting data with these goals in mind facilitated participants to construct their own account of how food and economic issues have changed over time.

To begin, we queried community members and health and government workers with open-ended questions to ascertain past, present, and future perspectives on conditions and interventions relevant to the community. This approach was also used as a guide when exploring current and historical government policy. Collecting future-oriented perspectives was an essential component of data collection. We obtained qualitative data on participant’s imagined futures—what they thought was possible, what goals they were currently working on, and what they hoped could happen. Pivotal to grounded theory methods like SA, “all is data” and therefore the researchers’ memos and field notes were also included as data. Once data analysis began, further data collection occurred using theoretical sampling to address incongruencies or gaps within the collected data.

Data analysis. To articulate and analyze the data, we used Clarke’s (2005) SA mapping strategies. These mapping strategies serve as analytic tools that enable the researcher to immerse themselves in the data and frame and analyze the situation of inquiry (Clarke et al., 2018). To develop our positional maps, we aimed to elucidate the basic issues in the situation and the major dimensions or axes of these issues. During this process, we created multiple versions using various axial elements and included all possible positions in the data.

By explicitly seeking a relative time line of positions, we determined food security and government intervention as being the major axes of the identified issues. We created three separate positional maps with these axes, indicating historical, current, and future tense positions (see Figures 1–3). Using a relative time line to separate historical and currently held positions (Figures 1 and 2) helped us differentiate and accentuate prevailing positions in contrast with positions that have changed by either being no longer relevant or an emergent discourse. For example, historically, food was used for both trade and consumption, but currently, money is replacing food as trade currency. Contemplating data and positions for inclusion on the future tense map had a somewhat different
importance. It forced us to consider nuances in the data for present reality positions (Figure 2) based on speculation, unseized opportunities, or hopefulness (imagined futures; Figure 3). By analyzing the data in this way, we were able to examine the big picture with all positions and ultimately recognize a directional trend in the discourse and positions over time as the weightiest positions on the maps physically shifted toward the upper right-hand corner of the maps temporally (Figures 1 and 3, with directional trend illustrated in Figure 4).

Being able to “see” the directional movement in positions and discourse over time pushed us to consider how these movements occurred within this system, under what conditions, how they could continue to develop, and what could be the levers of change. We saw this as an extension of abductive reasoning as we tacked back and forth between empirical data and conceptual ideas to develop mechanism-based explanations for positional movement while seeking further data through theoretical sampling as warranted. As program developers, this directionality literally pointed us toward the (imagined) futures of our stakeholders, which we seized upon when considering how we wanted to effect change. For example, a historical discourse maintained that government intervention was predominantly harming food security. Whereas in the directionality over time (Figure 4) map, this position has shifted to asserting that government and nongovernmental organization interventions may now play a prominent role in improving food security within the NCA. This trend is not immediately evident in the data, but upon “seeing” the shift in positions over time, it became more apparent and prompted analysis into how this position changed so dramatically over time.

Findings. While our final positional map (Figure 4) appears to be a clean line showing positional movement, in no way are we asserting that this directionality implied linearity, predictability, or certainty—only that predominant positions appear to be moving in a direction worth careful consideration. Furthermore, this trend in directionality does not implicate specific groups—only that the predominant discourses have been adjusting their positions in relation to the axes of concern. By creating our positional maps, we were able to construct a higher order conceptualization of positions representative of the larger situation. This allowed us to depart from individualized discourses to a system-level conceptualization depicted by our positional maps.

While our research is preliminary, we were able to begin constructing a mechanism-based explanation for the positional shift regarding government and nongovernmental organization (NGO) intervention in food security. The main force driving the positional shift is community engagement in government and NGO interventions. As Maasai community members are increasingly being consulted with and included in goal creation and policymaking, more feasible and appropriate interventions are being developed and implemented. While this is not a revolutionary finding, detailing how this shift occurred holds key information into how we can move forward toward improving food security within the NCA.

As an area ripe with a history of colonialization, this explanation demonstrates the deleterious results of interventions that fail to engage the communities affected. Shifting to community-based approaches is a relatively new concept for some partnering organizations that will be pivotal in developing future interventions. Therefore, demonstrating the benefits and desire for community engagement in food security initiatives in this way is essential to garner further support and direct future engagement.

Ultimately, our positional maps serve as an indicator to understand adaptation in the CAS as a whole and continue to inform our theoretical development. In our case, this change in
Positionality over time contributed to and informed an intervention program design. We were able to recruit support and obtain funding by demonstrating the trend toward innovation and evolution in the identified direction. We also used our realization of the changing trend toward government and NGO interventions as a positive, rather than negative, influence in food security to recruit a large cohort of Maasai women to inform our program design and implementation.

Considerations for Applying Directionality to Positional Maps

Positional maps are not meant to be an output of research but rather an analytical tool for studying a situation. They have proven to be particularly useful in our research oriented by a CAS framework. However, we assert that one can never fully understand a situation. Rather, we can only glean certain fleeting perspectives that are heavily influenced by our own agency and “situatedness” within. Nonetheless, we attempted to understand how things have happened as they have, however tentative and indeterminate, by recognizing what is in the described situation in terms of positions that are, were, and could be present. In doing so, we encountered a number of potential pitfalls researchers will need to be aware of to apply our methodological consideration.

Limitations. In our experience, we had an ardent desire to see linearity when linearity was not present. It is important for the researcher to be cognizant of any oversimplification that could develop out of this temptation. Furthermore, it is important not to assume predictability from data, trends, or directionality that emerge. Our hope is that by pursuing directional analysis, a researcher may uncover potential avenues going forward in research or action, fully aware that it may lead nowhere. Researchers who attempt to add directionality to positional maps should be cautious of these risks and shortcomings.

Lastly, in juxtaposing various discourses together, we foresee the risk of editing and omitting information to support research hypotheses. This risk is not limited to only SA. In our experience, we grappled with balancing dominant and marginalized discourses. Particularly with social justice research, we hold ourselves to the complex and realistic representations of the discourses that form our research. If we desire to understand the situation in all of its complexity, we must understand it in terms of complexity.

Future considerations. Through a series of theoretical discussions and analyses of data excerpts using positional mapping strategies, we developed the addition of directionality over time to positional maps as a further analytic tool in SA. While we applied this approach to an ongoing research project, further application is warranted to determine the viability of such a tool. Two of the coauthors seek to employ positional maps as described in their own dissertation work and hope to gain further insight into the potential of analyzing a situation in this way. Furthermore, we invite others to engage in a scholarly dialogue regarding our proposed SA methodological consideration.

Conclusion

Simple images of continuous time, bound to one place, are not sufficient to elucidate the complex worlds we occupy (Byrne & Callaghan, 2014). To cope with the impact of the future on the present requires rethinking time beyond the linear form (Byrne & Callaghan, 2014). CAS and SA research are not strictly done for phenomenological or sociological reasons but can be used to develop and build tentative theoretical models and certainly to create the impetus for change. Furthermore, identifying trends may allow for cautious speculation about the variety of mechanisms by which change may occur (Grant & Hood, 2017).

By explicitly seeking out marginalized positions and using the added analytical dimension of directionality in positional maps, researchers can determine how certain positions have evolved over time and speculate on potential futures. For researchers who create theory for the purpose of informing intervention, this tentative directionality can reveal opportunities for transformative action to create a more socially just society. Ultimately, the future is a matter of what will be made to happen (Byrne & Callaghan, 2014).

In this article, we have aimed to stimulate discussion regarding the potential and relevance of using SA to explore complex health and social justice issues. In departing from individual discourses to system discourses, we hope that future health and social justice nursing research will use an SA methodology and CAS overarching framework when applicable as they enable researchers to identify the underlying order beneath the perceived disorder of systems. Positional maps are tools for studying collective action, which can make social justice analysis more precise and speculative (Charmaz, 2005). As an anchor for agendas, one can use positional mapping to investigate future action, practice, and policy by making explicit connections between the theorized antecedents, current conditions, and consequences of major processes (Charmaz, 2005).

The complexity turn in public health nursing research may offer an innovative way of thinking about public health challenges, our understanding of relationships, and directionality. Hence, we suggest that investigation of social justice issue trajectories can be speculated using a complex adaptive nonlinear system so we may view, understand, and act on issues that promote population and community health. Positional maps have great analytical utility in unveiling nuanced positions and to make silences speak (Clarke et al., 2018). We propose that considering directionality over time in creating positional maps may simply add an additional analytical tool to the researcher’s toolbox.

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