

KNOWLEDGE BRIEF

Complexity Theory



This knowledge brief will seek to explain what complexity theory is, and its uses within public policy making. The role complexity theory can play within the food sector and the public health sector are outlined.

“Evaluating complexity for social change means considering all parts of the system, adaptation to the local context, relationships within the systems and their interdependencies, and emerging patterns (Preskill, Gopal, Mack, Cook, 2015)”

What does literature include about this theory?

Complexity theory does not have one concrete definition because it is rooted in multiple disciplinary areas (MacDonald, 2019). Therefore, from the perspective of public policy-making, complexity theory is seen as “not only complex because of social construct, but also because the natural processes that the public policies interact with are also complex... the [greater] number of [components] involved, the higher the complexity” (Morçöl, 2012, p.23). Complexity theory is given its name due to the many acting parts such as government, social service agencies and the public (Morçöl, 2012, p.22). Organizations themselves are also complex systems that are dynamic, unpredictable and multidimensional and have interconnective parts (PHABC, 2019).

Using this theory when navigating systems that are “non-linear, unpredictable or non-controllable” improves evaluation and understanding of the needs of a social sector an organization is aiming to serve (Preskill, Gopal, Mack, Cook, 2015). Evaluating complexity for social change means considering all parts of the system, adaptation to the local context, relationships within the systems and their interdependencies, and emerging patterns (Preskill, Gopal, Mack, Cook, 2015)

Complex Adaptive Systems (CAS) is a science that “occurs within the paradigm” of complexity theory (PHABC, 2019). CAS is “made of small, unpredictable, components that are related to one another” and analyzing a situation at this level is a useful tool to see how one part of the system influences the other (MacDonald, 2019)”. It is good to note how the components of complex systems, although related, each work individually in their area of expertise (MacDonald, 2019), such as a doctor working on a health issue regarding a policy, non-profit organization working to gather information to better serve the community and lawyers ensuring the policies are not violating any laws. The components are interdependent, meaning one part cannot be understood without understanding the other parts. When looking at CAS, a few things must be taken into consideration such as the type of relationships involved such as co-workers, the relationship among agencies and the relationship between the agencies and the community. Acknowledging outliers and thinking of the system as something that is *becoming* rather than something that is in its current state for it is unpredictable and always changing.

Complexity theory should be considered when evaluating whether organizations are remaining oriented to the unique qualities that separate them from others and maintaining key objectives and goals. Organizations should be stable and resist outside influence, however, being able to change and transform is also crucial (Devereux, Melewar, Dinnie, & Lange, 2020). Complexity theory aids organizations to see if they have become disoriented from outside influences and provides insight into adapting and changing while keeping their company and workers oriented to their goals and purposes. To remain oriented is to remain true to the “identity” or purpose of the organization (Devereux, Melewar, Dinnie, & Lange, 2020). Organizations must work in cohesion to achieve their goals, thus within the complex system, each part of the system have similar characteristics to the larger group, finding patterns among the parts may lead to a cohesive unit obtain the identity and maintain it (Devereux, Melewar, Dinnie, & Lange, 2020).

How has it taken up in the “food” movement?

The decision making processes for community food policies are complex because the food system is made of the human population, institutions, the environment and other factors (Nesheim, Oria, Yih, Resources, & National Research Council, 2015). Food systems are in part driven by supply and demand, consumers and producers. On the other hand, health, environmental and social and economic aspects also influence public policy decision-making of a food system, regarding what is produced how it is produced and how they are consumed by the human body (Nesheim, Oria, Yih, Resources, & National Research Council, 2015). Larger companies and institutions such as grocery stores, schools, restaurants and agricultural companies have the potential for economic gains, however, government leaders may intervene by implementing policies such as developing taxes (Nesheim, Oria, Yih, Resources, & National Research Council, 2015).

Complexity theory has a role in the food movement when it comes to decision-making because it involves producers (farmers) and their workers, consumers, health care sectors, institutions, government, and food retailers to name a few. As an interrelated system, the decisions of the government affect the consumers and farmers and all other parts of the system.

As mentioned above, while adhering to the main goal, complex systems must adapt to change (Devereux, Melewar, Dinnie, & Lange, 2020). This is important for the complex food system, which consists of various interrelated parts, where one section’s actions affect the entire system such as a development in the health sector the policies must adapt to accommodate the change.

How does it impact public health?

Complexity theory may be utilized for public health workers to approach difficult situations. The Public Health Association of BC (PHABC, 2019), defines complexity theory as: “the study of systems and problems that are dynamic, unpredictable and multidimensional and have interconnective parts”. Complex problems should not be made simple and should not be handled by individuals. As public health workers, complex problems should remain complex to involve a variety of individuals that have different expertise and backgrounds to each tackle one of the many components of the problem. This can be demonstrated by caring for a patient that is recently out of surgery, the patient requires doctors to see how he is healing, a nurse to help him take care of his wound and assist in his activities of daily living, a dietitian who may formulate a meal plan to encourage healing may be adjusted for comorbidity, and a physiotherapist to help rehabilitate after surgery to be able to perform his activities of daily living as he once did. This way the problem is being handled by multiple individuals who are strong in different areas and bring everything together to handle the situation. It is written that the CAS helps with (1) defining the problem, such as a need for surgery (2) implementing interventions, the surgery, and a team to help rehabilitate him and (3) evaluating the outcomes, such as how is he healing, is he able to

walk as he did before surgery, what is working and what is not working in his routine to get him back to where he was before surgery. (PHABC, 2019)

Implications of the theory on the work of the KFPC?

The KFPC has undertaken an analysis of the assets and gaps in each of the seven value areas that are included in the strategic plan. The analysis has identified a gap in the value area: “Alleviation of poverty: equitable access to healthy, culturally appropriate food” in terms of the intersectoral collaboration between the agencies and service providers who aim to address household food insecurity. It was communicated that the complex systems are working in silos, rather than as a collective group. There are few or weak systems in place to allow the transmission of information from one agency or service provider to another, this may lead to different priorities between them, and they may be unaware of who is doing what and how they are doing it.

To address this gap, the complexity theory should be considered by the KFPC. As mentioned, complexity theory is complex because there are various parts to a system, such as in making food policies, it includes government, non-profit organizations, for-profit organizations, and the communities affected by household food insecurity (PHAB, 2019; Devereux, Melewar, Dinnie, & Lange, 2020). The KFPC could play a further role in facilitating the relay of information among system actors, particularly regarding who is responsible for what aspect of a project and to determine if everyone is on the same page. For the communities experiencing household food insecurity, it is important that their concerns are being addressed and reported to all the components of the complex system for each of them to alter their approach. KFPC should employ tools such as systems mapping, networking, interviews, and memos for data collection to aid in the evaluation of the complexity of the system (Preskill, Gopal, Mack, Cook, 2015).

Complexity theory can be used for social change by considering all parts of the system used in making decisions for policies. The system should be adaptable to the local context, acknowledge the relationships within the systems and their interdependencies, and identify any patterns (Preskill, Gopal, Mack, Cook, 2015).

Nourish was an event held by the KFPC Which invited attendees of various backgrounds and areas of employment to participate in the discussion of “Indigenous food sovereignty and poverty as the root cause of household food insecurity” (Tapestry Evaluation and Strategy, Interior Health & Kamloops Food Policy Council, 2019). The majority of attendees were food security nonprofits, community members and others (Tapestry Evaluation and Strategy, Interior Health & Kamloops Food Policy Council, 2019). The “others” category was a collection of education and government, Health Authorities and a very small portion of business representatives (Tapestry Evaluation and Strategy, Interior Health & Kamloops Food Policy Council, 2019). It was an environment that encouraged connections among individuals and agencies to collaborate on future projects. KFPC has stated that they would like to hold a similar event with a higher turn out of business representatives to build a bridge between the business sector, nonprofits and community members (Tapestry Evaluation and Strategy, Interior Health & Kamloops Food Policy Council,

2019). Marketing and reaching out to the business community may be possible by inviting a guest speaker at the event who is of the business sector may lead to more businesses showing interest in partaking in the conversation if a like-minded representative spoke of the issues from their perspectives. Complex systems are held steady with an identity (Devereux, Melewar, Dinnie, & Lange, 2020) , and thus a business speaker may be the bridge to connect the business sector with the food security movement. It is recommended to possibly reach out to grocery retailers and restaurants who are already directly involved with food policies that dictate their business, or smaller businesses that may be looking to be more involved with the community.

References

- Devereux, L., Melewar, T. C., Dinnie, K., & Lange, T. (2020). Corporate identity orientation and disorientation: A complexity theory perspective. *Journal of Business Research*, 109, 413–42
- MacDonald, M. (2019). Simplifying Complexity: Public Health Approaches and Practice in Complex System [PowerPoint Slide]. Retrieved from <https://phabc.org/wp-content/uploads/2019/11/Simplifying-Complexity.PHABC-2019.pdf>
- Morçöl, G. (2012). A complexity theory for public policy. [*electronic resource*]. New York: Routledge, Taylor & Francis Group. (pp. 22-23) Retrieved from <http://ebookcentral-proquest-com/>
- Nesheim, M. C., Oria, M., Yih, P. T., Resources, N., & National Research Council. (2015). The US Food and Agriculture System as a Complex Adaptive System. In *A Framework for Assessing Effects of the Food System*. National Academies Press (US).
- Preskill, H., Gopal, S., Mack, K., Cook, J. (2015) Evaluating Complexity [Webinar] retrieved from <https://www.fsg.org/publications/evaluating-complexity>
- Public Health Association of British Columbia (2019). Simplifying complexity: Public health approaches & practice in complex systems. Retrieved from <https://phabc.org/wp-content/uploads/2019/05/Think-Piece-Summer-School-2019-.pdf>
- Tapestry Evaluation and Strategy, Interior Health & Kamloops Food Policy Council (2019) Nourish evaluation report: A community dialogue on the root causes of household food insecurity.