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ECONOMIC THOUGHT AND PRACTICE: A LOOK INTO ECONOMIC CONCEPTUALIZATIONS USING COMPLEX SYSTEMS THEORY

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ABSTRACT. This paper develops an innovative methodology using complex conceptual systems theory to study the conceptualizations of modern economists and the emergent economic practices that result from these conceptualizations. This approach integrates qualitative coding with network analysis to map interdependent ideas and identify leverage points within economic thought systems. The research in this study focuses on differences and discrepancies in economic thought between minority and dominant demographic groups and the resulting practices that are emergent from different conceptualizations. Analysis of 50 blog posts from 26 economists revealed four distinct conceptualizations: the 'Change-Inclusion' conceptualization (emphasizing equity and systemic change) was predominantly associated with minority economists; the 'Workers-Struggle' conceptualization (emphasizing worker essentiality and government intervention) aligned with white cisgender female economists; while an incomplete 'Risks-Individualism' conceptualization (emphasizing personal gain and condemning social safety nets) was linked to white cisgender male economists. The findings confirm vast differences in conceptualizations connected to distinct demographic groups, with corresponding differences in emergent economic practices. Although this innovative methodology is in early stages of development, the findings suggest it holds potential for understanding the complexity of economic thought and the relationships between conceptualizations of economics and practices.

JEL Classification: J15, Z13, Z18, A13, D83

Keywords: complex systems, conceptualizations, emergence, diversity, public policy

Introduction

The policies and practices employed in the economy stem not from simple ideas, but rather from complex conceptualizations that are shaped by one's lived experiences and values. According to the principles of complex conceptual systems theory (Donaldson & Allen-Handy, 2020, 2023), undesirable economic practices cannot be changed through policy alone; only

changing conceptualizations will lead to successful and long-term change in practices. Conceptualizations are influenced by demographic factors like race and sociohistorical situatedness. Numerous studies have elaborated on the connection between race, income, and political psychology. Previous works, such as that of Bakker (2017), examined a similar theme of personality traits affecting economic ideology, but without filters for race or sexual orientation. His study concluded that there is a correlation between personality traits and economic ideology, with the association diminishing as income level decreases. Bakker's study leads to similar work questioning how demographic specifications factor into determining one's personal opinions. Additional works reaffirm this premise specifically for gender groups. Cha and Thébaud (2009) examined the effect that men's economic status has on their gender ideology. They concluded that egalitarian ideology is deeply influenced by economic dependency in men, most strongly in rigid labor markets. Together the work of these authors provides a solid foundation for further research into economic ideologies and shows a large gap in the literature for study on those responsible for defining these ideas - economists. This proof-of-concept complex conceptual systems study develops a tentative methodology which allows deeper analysis into the conceptualizations held by economists of different demographic backgrounds to determine if there is reason to believe that different racial, cultural, and gender experiences affect economic conceptualizations. Understanding differences in conceptualizations could reveal why policies fail to resonate across groups. This study also provides insights on developing a new complex systems perspective that may explain why undesirable economic practices that perpetuate inequities cannot be changed through policy alone.

1. Literature review

This research positions itself at the crossroads of epistemology and diverse economic thought, aiming to explore neglected areas in economics, especially the interdependent networks of demographics, ideologies, and life experiences that connect individuals. These human connections and interactions form a complex system (Horn, 2008; Zellner & Campbell, 2015), and understanding such complexity requires distinguishing between classical general systems theory (GST) and complex systems theory (CST). GST (von Bertalanffy, 1951) focuses on integration and stability, while CST focuses on emergence, adaptability, and dynamics (Thurner et al., 2018). In GST, system elements are interdependent with linear causality; meaning changes to one element can significantly impact stability. CST, on the other hand, involves dynamically interdependent elements with nonlinear behaviors, where small changes can either cause major shifts or have minimal effects. GST emphasizes predictable behaviors, while CST focuses on emergent and often unpredictable behaviors. To address pressing economic challenges, it's essential to understand this complexity, as disruptions in any part of the system can lead to inefficiencies (Krakauer, 2019). By applying CST methodologies, issues like inequity and imbalance can be better understood (Arthur et al., 2019). This study introduces a new methodology to analyze economic systems, building off previous conclusions that complex conceptual systems can be mapped and analyzed through network analysis. These systems explicitly show how thoughts and actions interact to produce 'network failures' like inequity and division (Donaldson, Chowdhury, & Zowam, 2021; Podobnik et al., 2015).

Economic policies and practices are not stochastic, but directly emerge within a complex system (Arthur, et al., 2019), which is why CST is critical for developing equitable systems. CST highlights how economic practices emerge from shared ideas shaped by sociohistorical interactions. The interplay of conceptual metaphors, stories, and worldviews reveals both common and divergent economic perspectives (Donaldson, 2019). These shared

conceptualizations are key to building an economy that reflects the values and goals of the people.

Many economic policies fail to achieve their intended outcomes. This failure may stem from mismatches between policy creators' conceptualizations and those of different demographic groups. Examining underlying conceptual models could reveal leverage points for greater policy alignment and resonance. Complex conceptual systems theory provides insight into how policies emerge from diverse networks of ideas (Donaldson & Allen-Handy, 2023). Thus, policy cannot be successfully implemented without concurrently adjusting the conceptualizations where new outcomes are desired. For aligned practices to emerge, communities must develop a shared conceptualization constructed from mutually understood ideas and worldviews (Cornelissen & Werner, 2014). Recent economic policy failures, such as trade reforms and tax incentives, often reflect this mismatch between experts' intentions and public reception, especially among marginalized groups (Mueller, 2020; Wlezien, 2016). CST can help map these gaps and identify leverage points of alignment to improve policy outcomes.

A key application of this research is grounded in moral hazard theory (Arrow, 1963), particularly in addressing economic issues like hiring discrimination. While moral hazard traditionally concerns fiscal matters, it also plays a role in broader socioeconomic and political contexts, including race-based policy discrimination (Baker, 1996). For example, studies on workplace discrimination show that anti-discrimination laws don't necessarily reduce claims, but they highlight underlying issues like wage inequality (Coleman, 2008). Examining conceptual differences across groups can uncover factors that perpetuate these disparities, despite policy existing to mitigate them.

Mainstream economics often separates rationality from morality, but moral sentiments are essential to economic knowledge, despite traditional economic theory aligning with utilitarianism and consequentialism instead or emotion and welfare (Dow 2010). Complex CST bridges this gap, showing how worldviews shape actions or practices (Donaldson & Allen-Handy, 2023). It offers a new way to study the relationship between economic thought and action, which is crucial for addressing issues like moral hazard.

This study is grounded in complex conceptual systems theory (Donaldson, 2019; Donaldson & Allen-Handy, 2020, 2023) which describes conceptualizations as complex systems in which many interdependent ideas self-organize around attractor states, leading to emergent practices. This theory is a subset of complex systems theory, adopting the parent theory principles of 1) numerous interdependent elements, 2) emergent phenomena which cannot be explained through linear causality, 3) stability around attractor states, and 4) the use of network analysis as a primary analytical tool (Bar-Yam, 2003; Krakauer, 2024; Lü et al., 2016; Thurner et al., 2018). The complex conceptual systems perspective was also informed by conceptual metaphor theory (Lakoff & Johnson, 1980) which describes human thought as dependent on constellations of related metaphors, human actions as determined by these conceptual metaphors (Gibbs, 2014), and economic outcomes as determined by conceptual metaphors (Lakoff & Johnson, 1999). Complex conceptual systems theory argues that because practices are emergent from conceptualizations, practices can change only if the underlying conceptualizations change first (Donaldson & Allen-Handy, 2023). Therefore, understanding different conceptualizations may be crucial as it provides context and insight behind economic practices, and identifies leverages points situated within different conceptualizations that can be mapped using network analysis methods such as betweenness centrality measures (Wright & Meadows, 2009; Valente, 2010). Applying complex conceptual systems theory to foundational economics principles reveals which practices emerge from different conceptualizations, thereby uncovering what ideologies are responsible for both desirable and undesirable societal outcomes. The innovative complex conceptual systems analysis used in the

current study has been used to develop an empirically validated theoretical foundation for complex conceptual systems theory and to analyze conceptualizations of learning (Donaldson, 2019, Donaldson & Allen-Handy, 2020, 2023), research (Donaldson et al., 2021), computer software development work (Donaldson, 2022), diversity, equity, and inclusion (Armenta et al., 2024), and creativity (Donaldson & Katompa, 2025; Woodward & Donaldson, 2021). However, this is the first study to apply this theory to investigate conceptualizations of economics to identify key economic conceptualizations held by unique demographic groups.

Traditional epistemological approaches like positivism or constructivism often shape research methodologies, with positivism favoring quantitative approaches and constructivism supporting qualitative ones (Lincoln, Lynham, & Guba, 2011). New epistemological stances have emerged through the unique methods of agent-based modeling and network analysis that are used in CST (Kaplan & Garner, 2020; Nicolis, G. & Nicolis, C., 2012). This approach calls for a holistic understanding through the use of linear and nonlinear, objective and subjective, contextualized and generalized, and individual and collective phenomena (Kaplan & Garner, 2020).

Understanding the conceptual models behind economic thought is valuable not only for policymakers but also for economists themselves. Unexamined conceptual frameworks can perpetuate blind spots, particularly in conceptual frameworks held by different identity groups (Goffman, 1974/1986). By analyzing these frameworks, economists develop a reflexive understanding of how their own perspectives shape their research and its applications (Weinstock et al., 2017), further enabling them to identify intersections between their own models and those emergent from differing demographic groups. Reorienting policy to align with these conceptual intersections can increase efficacy and policy adoption (Dow, 2004).

The use of network analysis in economic research is growing, especially for analyzing complex systems (Haynes & Alemna, 2022), but its application to conceptual models is still emerging. Network analysis allows for economic concept mapping, cluster detection, and visualizing interdependencies and leverage points within conceptual economic systems. By mapping complex systems of economic conceptualizations, methodologies for more equitable and diverse economic systems can be developed.

2. Methodological approach

An innovative complex conceptual systems analytical approach was used in this study, integrating qualitative coding strategies informed by grounded theory (Charmaz, 2014) and discourse analysis (Gee, 2014) with multiple forms of network analysis. For this study, a total of 50 blog posts were collected from 9 Minority economists (defined as non-White or non-Cisgender), 8 White Cisgender Female economists, and 9 White Cisgender Male economists resulting in a corpus of 50,465 words. Using open coding strategies (Charmaz, 2014; Corbin & Strauss, 2015; Gee, 2014), the data were coded in MAXQDA Analytics Pro software at the sentence level with emergent codes within the complex conceptual systems categories of non-metaphorical characterizations, metaphors, values, practices endorsed, practices condemned, and economic theories. During this process the authors met weekly to negotiate the codebook, producing 123 codes covering 1,232 coded segments. After coding, Pearson's correlations (1-tailed because normal distributions could not be assumed) were calculated to determine the likelihood of all pairs of codes appearing within the same blog post. These correlations were calculated for code pairs in each of the categories of non-metaphorical characterizations, metaphors, and values and exported as Microsoft Excel correlation matrices in order to produce the network databases. Separate matrices were created for correlations at the $p<0.001$, $p<0.01$, and $p<0.05$ levels, and UCINET network analysis software (Borgatti et al., 2002) was then

utilized to construct network maps at each level. Within each network map, Girvan-Newman cluster analysis was conducted (Girvan & Newman, 2002) to identify clusters of non-metaphorical characterizations, clusters of metaphors, and clusters of values. Each map was analyzed to determine which confidence level was most appropriate for each category based on the Q values (a measure of cluster modularity) resulting from cluster analysis. The network maps were constructed with node sizes set according to betweenness centrality measures (Scott, 2017). This measure allows nodes to be identified for importance in terms of connecting nodes to other nodes as opposed to importance in terms of connecting other nodes to itself. Nodes with the highest betweenness measures were interpreted at leverage points within the network (Dan & Shunkun, 2022; Fu et al., 2017). Returning to MAXQDA, codes were collapsed within each cluster. Clusters of metaphors were defined as conceptual metaphors, clusters of non-metaphorical characterizations as conceptual stories, and clusters of values as worldviews (Donaldson, 2019). Correlations between conceptual stories, conceptual metaphors, and worldviews were calculated and interpreted as conceptualizations of economics, which were given names according to the ideas contained within them and collapsed in MAXQDA. After this was complete, Pearson's correlations (1-tailed) were calculated and made into clustered network maps of conceptualizations of economics in relation to practices endorsed and practices condemned to identify sets of emergent practices from different conceptualizations (Lü et al., 2016). Lastly, frequency analysis was conducted to identify differences in conceptualizations across demographic groups.

These methodologies proved to provide rich data for analysis, though not without disadvantages. The benefits of using the MAXQDA software for text analysis are the ease and flexibility of coding, however streamlining codes across different coders created redundancy. For instance, if one coder on the project codes a sentence as the worldview "Darwinism" while another codes the same sentence as "Darwinian", the software will show that the sentence has 2 different codes associated with it despite the codes having the same meaning. To prevent this redundancy and ensure accurate data, the coders consistently and frequently combed through the codebook to search for and eliminate duplicate codes. Positively, this flexibility of coding and consistent re-coding allowed the researchers to truly discuss the nuances of meaning between colloquially similar words that may merit their own codes in an academic context.

3. Conducting research and results

Four major conceptualizations were found, and are illustrated in a complex conceptual systems network map (see Figure 1). Two of these conceptualizations are considered complete, as they include elements of both conceptual metaphors and conceptual stories. The two complete conceptualizations are the Change-Inclusion conceptualization (C-I) represented as black circles, and the Workers-Struggle Conceptualization (W-S) as blue triangles.

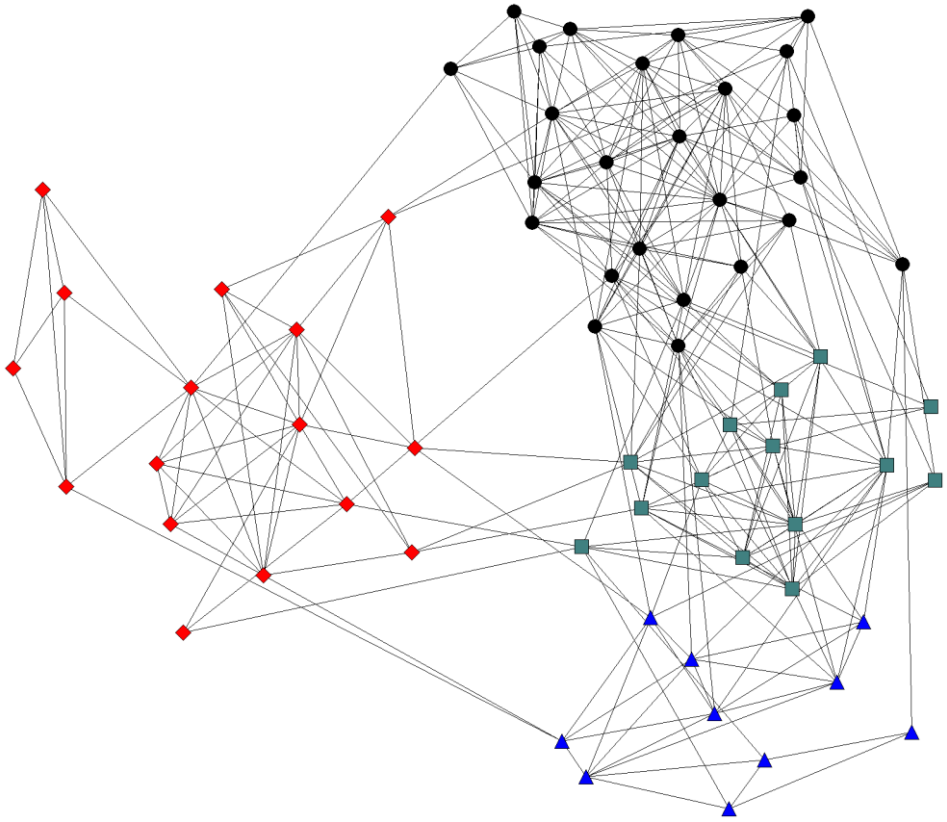

Figure 1. Conceptualizations of Economics
Legend: *nodes represent conceptual elements, lines represent correlations, node shapes/colors indicate cluster membership, node placement and distances are spring-layout artifacts that should not be interpreted metrically*; Source: *own data*

The C-I conceptualization (black circles in Figure 1) is made up of the constructive-strengthening conceptual metaphors, the change-inequality conceptual story, and the equality-equity-inclusion worldview. In this conceptualization economics is described as a means to create a more equitable and efficient society. The economy is essential to overcoming intersectional and systemic inequality, by implementing change and social justice initiatives to increase visibility and collectivism. Notable ideas in this conceptualization include 'Inequality is intersectional', 'equity', 'strengthening' and 'justice (social).' The emergent practices (black squares in Figure 2) include endorsing antiracism and anti-racist policies, gender/equity legislation and developments, and condemning discrimination. Together these elements help to define a conceptualization that aligns strongly with the Minority demographic group.

The W-S conceptualization (blue triangles in Figure 1) consists of the struggle-division conceptual metaphors and the worker-impact conceptual story. In this conceptualization, economics is described in terms of struggles faced by individuals and the economic strain caused by division and the failure of the government. It emphasizes that workers are essential, and economic impacts will vary among social groups. These metaphors and non-metaphorical characterizations are constructed from ideas like 'Divide, divided, division', 'Workers are essential', and 'Struggle (people).' The emergent practices (blue squares in Figure 2) include endorsing government intervention, raising the minimum wage, and alleviating personal economic risks. The W-S conceptualization defines patterns of thought consistent with 'White Cisgender Female' group.

There are also two incomplete conceptualizations resulting from the data, which include the Support-Balance (IS-B) Incomplete Conceptualization shown as green squares (figure 1)

and the Risks-Individualism (IR-I) Incomplete Conceptualization shown as red diamonds. The IS-B incomplete conceptualization is built from ideas like 'Risks, taking risks is bad', and 'Balance, imbalance', and the emergent practices include endorsing social security, creating jobs/employment, and regulation. Alternatively, the IR-I incomplete conceptualization is constructed from ideas like 'Risks are okay, something is not a risk', 'Individualism, independence', and 'Personal gain.' The emergent practices (red squares and dark green squares in Figure 2) include condemning actions like immigration and helping immigrants, social security, and equity/social justice programs. However, this conceptualization is incomplete in nature as it contains only worldviews (individual-gain) and conceptual stories (risks-uncertainty).

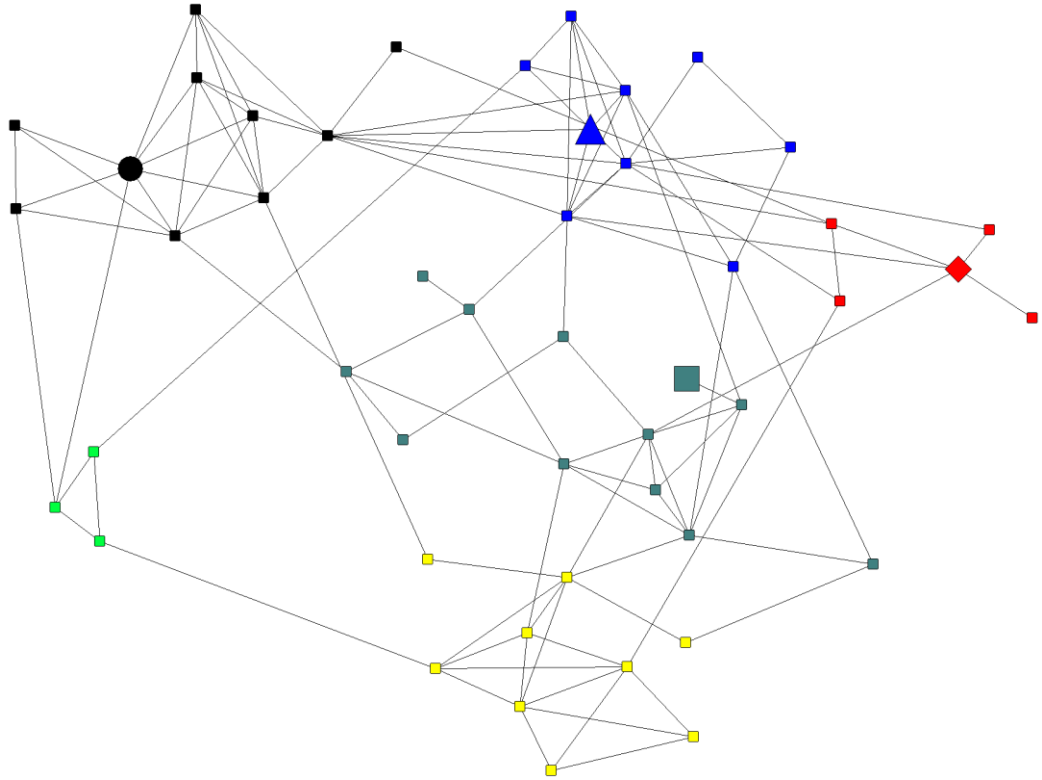

Figure 2. Practices Emergent from Conceptualizations of Economics
Legend: *small nodes represent practices, large nodes represent conceptualizations, lines represent correlations, node colors indicate cluster membership, node placement and distances are spring-layout artifacts that should not be interpreted metrically*; Source: *own data*

The key factor to adjusting these emergent practices is to focus on leverage points. These leverage points represent key conceptual elements in the map with the highest levels of betweenness centrality (Figure 3), thus holding the greatest influence over the rest of the network analysis map. The manipulation of these leverage points therefore has the power to alter the overall conceptualization as a whole and influence what practices emerge.

As seen in this study, there are several emergent practices from the conceptualizations found. It is up to the public and thought leaders to determine which of these practices are desirable for society, and which practices are undesirable, or even harmful, to its function. If it is decided that a practice is undesirable, the best strategy to eliminate or change that practice would be to disrupt leverage points within the corresponding conceptualization. Leverage points can be thought of in two ways. In problematic conceptualizations – conceptualizations from which problematic practices are emergent – leverage points are ideas to which long-term

sustained pressure can be applied in order to destabilize those ideas. In conceptualizations from which desirable practices are emergent, leverage points can be seen as 'magnets' which can 'pull' problematic conceptualizations toward desirable conceptualizations. Leverage points in desirable conceptualizations can also be targets of efforts to strengthen and reinforce the conceptualization.

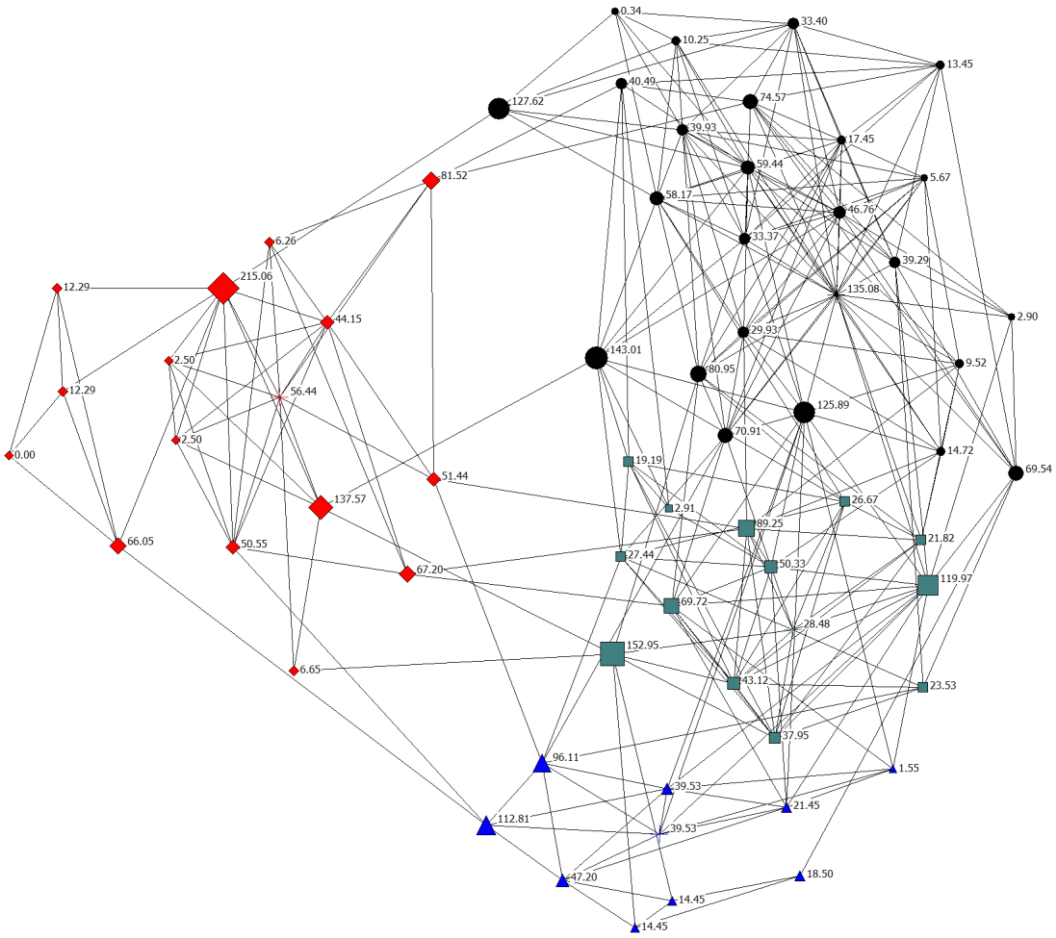

Figure 3. Leverage Points in Conceptualizations of Economics
Legend: *nodes represent conceptual elements, lines represent correlations, colors/shapes represent cluster membership, node sizes and labels represent betweenness centrality values, node placement and distances are spring-layout artifacts that should not be interpreted metrically*; Source: *own data*

In the network maps produced from the data, there were several key leverage points that could be utilized for changing or reinforcing emergent conceptualizations from this research. For instance, the value of productivity with a betweenness score of 127.62, is a leverage point within the Change-Inclusion conceptualization, but is highly connected to the Risks-Individualism conceptualization. As an example, let's say that emergent practices from the R-I conceptualization are found to be undesirable and emergent practices from the C-I conceptualization were found to be desirable. To shift practices, one would have to first shift the conceptualizations. One could disrupt a leverage point within the R-I conceptualization, like the value of 'competition, social Darwinism' which also has a high betweenness score of 215.06. By problematizing the value of social Darwinism and instead reinforcing the value of productivity, the conceptual framework shifts to endorse the emergent practices from the C-I conceptualization.

Other major leverage points in this network map include the value of 'action, advocacy, and activism' within the Support-Balance incomplete conceptualization with a betweenness of 152.95. However, several leverage points within the conceptualization are not made up of values, but rather metaphors such as 'sharp' with a score of 143.01 and 'shoulder, carry' with a score of 125.89. Therefore, in change efforts, these metaphors would be either used more often if the conceptualization is deemed desirable, or consciously avoided if the conceptualization is deemed problematic.

The resulting conceptualizations found among the Minority, White Cisgender Women, and White Cisgender Men categories in this study are particularly salient for economic study and policymaking as they reveal the conceptualizations that may contribute to marginalization.

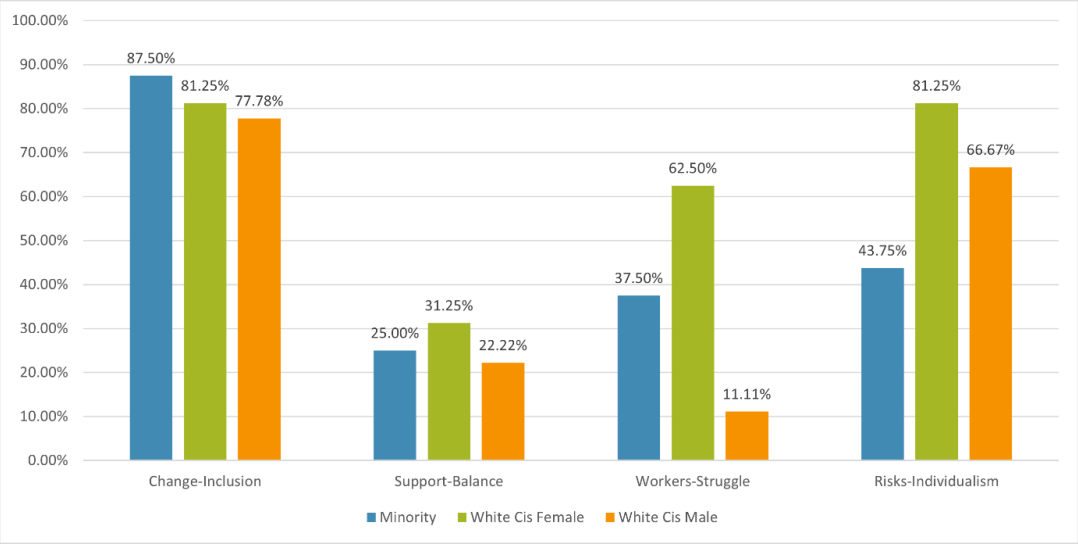

Figure 4. Frequencies of Conceptualizations by Demographics
Source: *own data*

In the complete network map the IR-I conceptualization was connected in a cluster with the White Cisgender Male demographic category, indicating there is a strong level of betweenness present in the IR-I conceptualization among the writing of White Cisgender Men in this study. Some of the most notable elements in this cluster include personal gain (value), competition/Darwinism (value), and condemning raising wages (practice). While no absolute conclusions can be made, and IR-I is an incomplete conceptualization as it is missing the important element of metaphorical characterizations, the findings still provide intriguing evidence that could be investigated with further study.

The White Cisgender Female demographic group was connected with the W-S conceptualization, shown as blue triangles, and the Minority demographic group related to the C-I conceptualization, shown as black circles. These two are strongly connected in the network map in Figure 5, by the IS-B conceptualization in green squares, indicating there may be some conceptual intersectionality between these two demographic groups. The S-I conceptual cluster is made up of a large number of metaphors like 'boost/boosting' and conceptual stories like 'consumption/spending is necessary." These elements work as a glue between the blue triangle and black circle clusters.

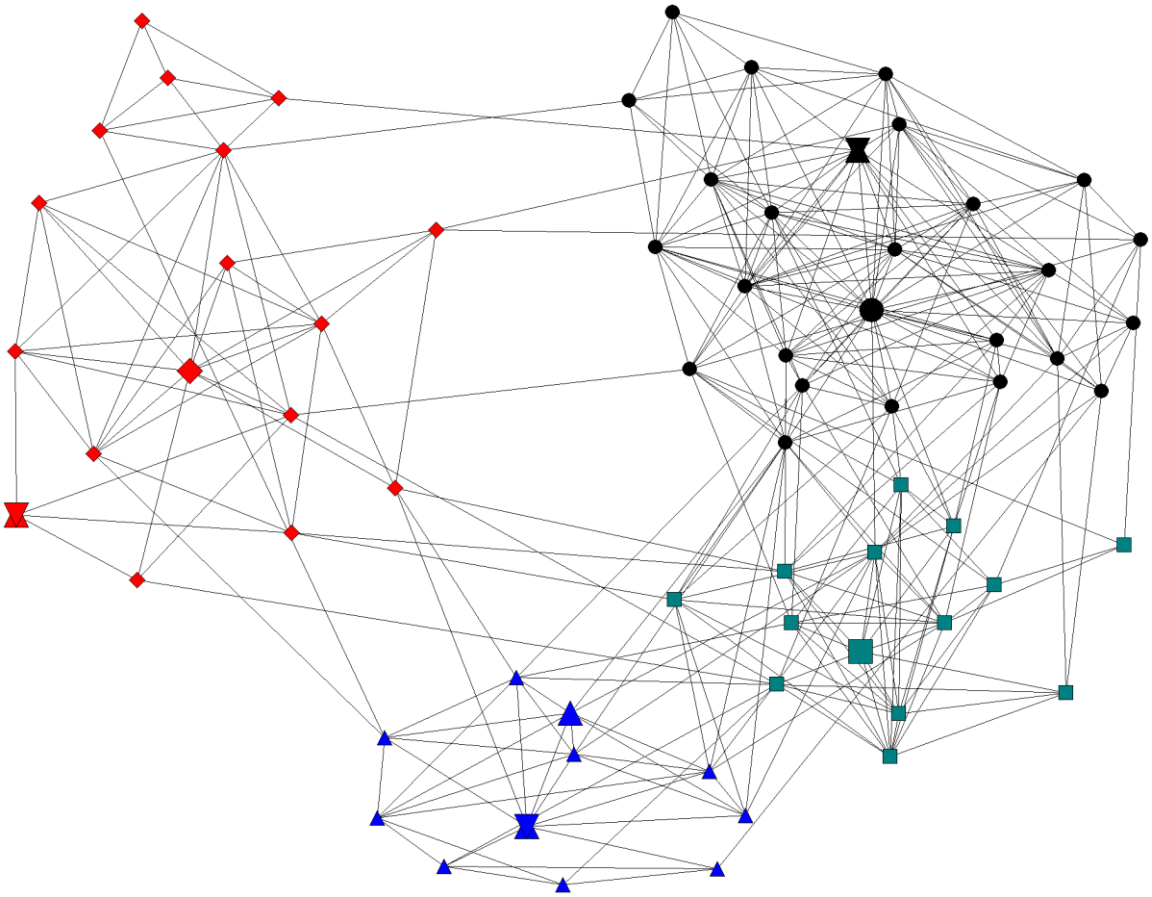

Figure 5. Network Map of Conceptualizations with Demographics
Legend: *circle, square, diamon, and triangle nodes represent conceptual elements, hourglass nodes represent demographic groups, lines represent correlations, node shapes/colors indicate cluster membership, node sizes indicate betweenness centrality values, node placement and distances are spring-layout artifacts that should not be interpreted metrically*; Source: *own data*

This raises further research as to why the White Cisgender Female and Minority groups that have their own complete conceptualizations can be so strongly linked together by an incomplete conceptualization. In broader economic applications, linkages such as these could imply alternative forces in the shaping of economic policies and practices, and raises further investigation as to whether or not moral hazard is present. Most obviously, if there is direct evidence of dominant gender or racial groups advocating practices that either directly harm or disenfranchise minority groups, there may be substantive evidence present to reject the assumption that policies are decided objectively with no malicious intent toward minority groups.

Conclusion

This study concludes that there are conceptual differences present among various demographic groups, and thus their emergent practices differ. These findings provide rich evidence for discussion into ideologies among demographic categories, and raises questions into equity visibility for these groups within the field of economics. There is great importance in ensuring that all conceptualizations are being discussed and represented in a way that allows their emergent practices to be evaluated with equal opportunity.

This study's application of complex conceptual systems analysis yielded intriguing findings regarding distinct economic conceptualizations in different demographic groups. Specifically, the analysis empirically identified four distinct conceptual networks, two of which were complete conceptualizations linked strongly to specific demographics: the 'Change-Inclusion' (C-I) conceptualization, characterized by themes of equity and systemic change, was predominantly found in the writings of Minority economists and correlated with emergent practices endorsing antiracism and gender equity policies. Conversely, the 'Workers-Struggle' (W-S) conceptualization, emphasizing worker essentiality and governmental failure, was primarily associated with White Cisgender Female economists and linked to practices endorsing minimum wage increases and government intervention. An incomplete 'Risks-Individualism' (IR-I) conceptualization, focusing on personal gain and competition while containing elements condemning social safety nets, was dominant in the White Cisgender Male cohort. Furthermore, the network analysis successfully pinpointed specific concepts like 'productivity' and 'competition/social Darwinism' as leverage points with high betweenness centrality, indicating their significant structural role in connecting different ideas within and across these conceptual systems. These empirical findings demonstrate the existence of varied, demographically-associated conceptual structures underlying economic discourse and highlight specific points of potential influence within those structures.

Like with any new methodologies, there are still research limitations that can be remedied with more extensive studies in the future. Since this is the first study examining economic conceptualizations using complex conceptual systems theory and the data set is limited, this research serves largely as a proof-of-concept study to demonstrate the viability of a new complex economics conceptual systems methodology. Despite this being a new theoretical approach to economic research, the findings of this study suggest that the use of complex conceptual systems theory in other financial and economic inquiry is promising. In subsequent research, studies should use larger data sets with several different sources of data, like interviews and audio recordings to provide diversity in linguistic patterns and styles. Further, sources used for this study were limited to American economists, and research comparing conceptualizations from international economists would be likely to produce additionally valuable findings.

The findings from this pilot study investigating conceptualizations of economics through complex conceptual systems theory and methodology suggest that this perspective and analytical approach could be both salient and powerful not only for understanding the complexities, interdependencies, and emergent phenomena involved, but also for constructing a society that utilizes emergent practices from the most desirable conceptualizations of economics possible. The ability to shift practices indirectly through strategic long-term and sustained pressure being applied to thoughts and beliefs as leverage points is potentially an effective and successful way to effect substantive changes in behaviors. Thus, the most efficacious way to adjust current economic practices may be to employ this theoretical perspective and research methodology on a wider scale - affecting policy and government accordingly.

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