

Ontological Stances and Systems Thinking in the *Favela* and *Asfalto*

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Abstract: Favela residents in Brazil have been marginalized throughout their history. Nonetheless, the favela environment seems to create conditions conducive to an ontological stance that could be advantageous for engaging in complex systems. This study is a preliminary examination of people from different social backgrounds in Rio de Janeiro, both *favela* (working-class) and *asfalto* (middle-class) residents, and evaluates whether their ontological stances might present any markers for complex systems thinking potential.

Introduction

Favelas are low-income communities in Brazil that exist in close proximity to middle- and upper-class neighborhoods (*asfaltos*) in major cities such as Rio de Janeiro. Economists Bourguignon, Ferreira, and Menéndez (2007) found that favela residents encounter both marginalization and a public education system that discourages intergenerational educational mobility, producing chronic underachievement in these communities. Nonetheless, based on my observations over the past five years, I believe that life in favelas encourages residents to leverage an ontological stance that could aid their understanding of complex systems. This study is a first step in exploring this hypothesis.

Literature Review

According to Resnick and Wilensky (1998), learning about complex phenomena requires thinking in levels. Multi-level thinking is the simultaneous consideration of (1) the micro level by taking the perspective of the individual agent, (2) the macro level by taking a step back and appreciating a third-person perspective, and (3) the connections between levels by attending to the relationships among individual agents of the system (Resnick & Wilensky, 1998).

Ontological stances that are geared toward understanding systems thinking would thus present the following markers: (1) the ability to see multiple perspectives (Resnick & Wilensky, 1998; Wilensky & Reisman, 2006), and (2) a focus on relationships (Resnick & Wilensky, 1998). My central hypothesis is that the socialization of favela residents causes them to develop a propensity for attending to relationships and taking multiple perspectives of familiar situations. This propensity, in turn, could produce an advantageous psychological milieu for engaging in complex systems thinking.

Method

There were 89 participants in this study (67 adults [mean age = 41.5] and 22 children [mean age = 9.6]). Forty-two participants had a middle-class background (37 adults and 5 children); the overall mean age of middle-class participants was 36.3 years ($SD = 18.4$) and their mean years of schooling was 14.3 years ($SD = 4.9$). Forty-seven participants had a favela background (30 adults and 17 children); their overall mean age was 31 years ($SD = 19.8$). The favela sample came from eight different favelas around the state of Rio de Janeiro. The mean years of schooling among favela adults was around 7.3 years ($SD = 5.4$).

The interview consisted of a drawing task and 12 open-ended questions that were intended to uncover participants' differences in reasoning on familiar issues. The present focus is on participants' drawings and reports on what they drew. Initially, participants were prompted to draw the places where they lived with the following question: Could you please draw the place where you live? Once participants had finished drawing, a follow-up question was asked to prompt them to describe their drawings: Tell me about what you drew? The first interviewees contacted were students, parents, and employees from a community center in the favela of Chumbada. A modified snowball sampling procedure was used where informants were asked to recommend another person for the interview who was as different from him or her as possible. Kappa was established by having a blind rater code 20% of all the drawings and reports.

Results

My results revealed that favela residents were more likely to talk about relationships and to use multiple visual perspectives (including both standard and aerial views) when drawing where they lived.

Aerial perspective.

Drawings were coded as having either an aerial perspective (bird's eye view) or a standard perspective. Favela residents were more likely than middle-class residents to adopt an aerial perspective when drawing ($\chi^2(1, N = 87) = 9.43^a, p = .002, \phi = .33, \text{Kappa} = 0.658, (p = .005)$). Since residents' dwellings could have influenced their visual perspectives (e.g., living on a hill might encourage drawing from an aerial perspective), I controlled for the type of home (high-rise or house) and the elevation of its location (hill or plain). There was no correlation between those variables and the adoption of an aerial perspective.

Use of multiple perspectives.

Rather than depicting a solely standard or aerial perspective, some participants drew from mixed spatial perspectives; for example, illustrating both the inside and outside of a house, or using both an aerial view and standard view in one drawing. The favela participants were more likely to use multiple visual perspectives. The results were statistically significant ($\chi^2(1, N = 87) = 15.237^a, p = .000, \phi = .418, \text{Kappa} = 0.54, (p < 0.000)$).

Use of relationships in the drawing.

I also counted the number of relationships that participants reported when describing their drawings. I coded for relationships when participants (1) used prepositional phrases relating components of the drawings to each other (e.g., "This house is behind X street") or (2) related the components of the drawing to a personal episode (e.g., "This house is where my aunt lived; she liked to invite the whole family over every year").

Overall, the favela participants referred to more relationships among the components of their drawings. The favela sample talked about relationships an average of three times more than the middle-class sample did ($t(66) = 4.58, p < .000$, degrees of freedom adjusted for unequal variance, eta squared = 0.198, Kappa = 0.73, $(p < 0.001)$). I controlled for the number of words people used and the difference was still statistically significant.

Findings

My main finding is that the favela residents' drawings and descriptions revealed multiple perspectives and relationships. This finding is significant because it suggests favela residents' potential for appealing to these ontological stances when thinking about complex phenomena in familiar environments. These stances could be leveraged in educational settings by starting instruction with familiar systems to the favela dweller.

Conclusion, Implications, and Future Work

Despite the heterogeneity among the favela populations I studied, there was a consistent pattern of results that revealed what Wilensky and colleagues have long advocated as a base for thinking in levels: the use of multiple perspectives and a focus on relationships. These markers signal the ability to develop and build on an understanding of aggregate complex phenomena. Favela residents from diverse backgrounds seem to exhibit these abilities spontaneously on issues that are familiar to them. Because many systems have similar archetypes, favela residents' quotidian knowledge could be leveraged in thinking about other systems in fields as diverse as science and sociology.

While this study was focused on the favelas of Brazil, these findings could potentially translate to other low-income communities around the world, creating visibility for the alternative perspectives adopted in differing sociocultural and economic environments. It is also important to highlight that these findings do not imply that the middle class population cannot or does not show potential for thinking about complex systems.

In the future, I would like to examine whether these markers of multi-level thinking translate into better comprehension of and reasoning about complex systems. In that vein, I next plan to examine participants' responses to questions about inequality and social mobility to see what types of resources participants appeal to when speaking about emergent phenomena in their society.

References

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