Community Problem Solving: Collaboration, Complexity, and the Threat of Type III Error in Problem Formulation

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ABSTRACT

A diverse group comprised of University of Georgia, Athens, Tuskegee University, and community-based organizations has been working to develop an organization modeled after a federal commission to address persistent poverty in the Black Belt Region (BBR). Even though there is objective data describing poverty in the region, each stakeholder views the problem differently. As a result, three different legislative initiatives have been sponsored to address the problem. Here, competition and disagreement among stakeholders have fueled a rush to formulate a solution without first investing sufficient effort to define the right problem. Failure to define the right problem could lead to a Type III error: solving the wrong problem. This paper will employ problem-structuring theory to analyze a posteriori the activities of the poverty initiative. Insights from this analysis will be used to formulate an alternate approach for formulating a solution that would likely reduce the probability of committing a Type III error.

Keywords: problem formulation, Type III error, ill-structured problem, persistent poverty, collaboration.

INTRODUCTION AND BACKGROUND

The Black Belt Region (BBR) is a crescent shaped region of eleven states situated in the Southeastern United States. The region is comprised of 642 counties of eleven southeastern states that includes Arkansas, Tennessee, Mississippi, Louisiana, Alabama, Georgia, North Carolina, South Carolina, Virginia, Texas, and Florida, where persistent poverty continues to be a chronic problem [22]. The term Black Belt was first used by Booker T. Washington to describe the rich black soil of the region. Today the term is used to refer to those counties in eleven southeastern states with African American population that is equal to or greater than 12 percent [22]. In the fall of 2001 an initiative was conceived to address chronic poverty in the BBR. The initiator of this policy effort was a coalition of community-based organizations (CBOs), the University of Georgia Athens (UGA) and Tuskegee University (TU). This coalition was referred to as the Black Belt Initiative (BBI).

UGA was the lead institution on the study project. On learning of the efforts of the coalition, the U.S. Congress, through the auspices of Sen. Zell Miller's office, gave UGA a grant of $250,000 to study the feasibility of creating a federal commission to address persistent poverty in the BBR. A Georgia businessman gave a matching award of $250,000.

STUDY METHODOLOGY FOR INVESTIGATING THE FEASIBILITY OF A FEDERAL COMMISSION

The plan for conducting the study, developed by UGA, revealed that the investigation was focused primarily on collecting data on economic development and demographic issues and was designed to employ traditional research techniques to gather quantitative data. The study would include only seven of the eleven states making up the BBR. The BBI working group seemed especially ill-at-ease with the lack of a strong community outreach and participatory research component, and the exclusion of people in Black Belt states from across the region from active participation in the study. In response to the concerns of the BBI members, the UGA expanded the terms of reference of the study to include a community outreach and participatory action research component, which TU and its 1890 and CBO partners in the BBI would implement. Tuskegee employed a combination of participatory focus group, case study, and survey methodologies. The TU study focused on identifying issues such as: community-based efforts and infrastructure dedicated to addressing persistent poverty related to education, business development, health, and community development and identifying successful programs and service delivery models. It also solicited opinions regarding the need for creating a mechanism or a federal commission and the design of the federal commission. The UGA study focused on only seven of the eleven states accounting for 242 counties, while the TU study covered all 642 counties.

UGA in their portion of the study, conducted a series of state meetings with government agencies, businesses, development centers, non-government organizations and local development districts to solicit their opinions on the nature and impact of persistent poverty on the region, the role of a federal commission in addressing persistent poverty and the structure

and feasibility of such a commission [2]. UGA was to synthesize its findings along with that of TU and present a report with recommendations to Sen. Miller.

In these studies, poverty was defined as an individual with annual earnings less than $8,667 in 1999, or a family of four with a 1999 income less than $17,029. By this definition, a poor county is one in which a high percentage of the residents are living in poverty. And a county is described as having persistent poverty if a high percentage of its residents live in poverty over a long period of time, which the study delineated as covering the period 1980 to 2000 [2].

FINDINGS AND RECOMMENDATIONS OF TUSKEGEE UNIVERSITY AND UNIIVERSITY OF GEORGIA ATHENS STUDIES

The findings of both studies [2, 20], agreed that there is persistent poverty in the region known as the Black Belt Region. In Table 1, the study report [2] identified three major areas that should receive flexible funding based on local census tract needs.

Table 1. Priority Areas to be Served by Commission

UGA	TU
a) Human resource development	a) Education
b) Economic development	b) Health care
c) Infrastructure development	c) Transportation systems
	d) Housing
	e) Economic development
	f) Infrastructure development
	g) Access to capital and asset creation

Source: University of Georgia Carl Vinson Institute of Government [2].

The TU report identified six areas that should receive funding based on census tract needs. It is possible to interpret the three areas identified by UGA as umbrella areas or general categories under which one can subsume the more specific areas identified by TU. For example, it could be argued that transportation systems would fall under infrastructure development, while health care and education would fit under human resources development. This then would leave housing and human access to capital as areas of emphasis that differs from UGA's proposal.

Notwithstanding some general level of accord on priority areas to be served, there is a fundamental difference between TU and UGA in the strategic design of the proposed federal commission, i.e. the governance structure of the commission. The TU study recommended community participation in the governance of the proposed federal commission through a constituency representation board; whereas the UGA study recommended the Appalachian Regional Commission (ARC) model, in which participation is restricted to consulting with community leaders and CBOs. Table 2 provides a contrast of both studies on this issue.

Table 2. Comparison of governance Structure Proposed by TU and UGA Studies

TU's proposed Delta/ Black Belt Regional Authority (D/BBRA)	UGA's proposed Southern Regional Commission (SRC)
1. Federal co-chair appointed by the president and confirmed by the senate.	1. Federal co-chair appointed by the president and confirmed by the Senate.
2. Each governor of participating states will be members of the board.	2. Each of Governors of participating states will be members of the board
3. Each Governor selects an "alternate" to represent them in most matters.	3. Each governor selects an "alternate" to represent him/her in most matters.
4. Decisions must be approved by a majority of the states <u>and</u> the federal co-chair.	4. Decisions must be approved by a majority of the states <u>and</u> the federal co-chair.
5. The existing authority would be expanded to include a Constituency Representation Board ("CRB") of CBOs/FBOs/higher-education institutions from the distressed region.	5. Various stakeholders (including non-profits, CBOs, institutions of higher learning and the business community) are consulted with during the development planning process.

Source: Tuskegee University [20].

TU and its coalition of CBOs and 1890 institutions held fervently to what they deemed to be their touchstone principle, which is to enable and empower residents to be agents of their own development, instead of being the passive object of the development process. To this end, they viewed substantive participation (representation at the highest level of decision-making, with voting rights) in the governance of the proposed federal commission as the only means for residents in persistently poor counties to achieve empowerment and become real agents of their own development.

Based on the findings and recommendations of the UGA study, Sen. Zell Miller proposed the Southern Regional Commission (SRC) Act of 2003 in the 108th Congress. Almost concurrently, House Rep. Arthur Davis proposed the Southern Empowerment and Economic Development (SEED) Act of 2003 in the 108th Congress to form the Delta Black Belt Regional Authority (DBBRA). The SEED Act incorporated many aspects of the findings of the UGA study. However, the TU community-based perspective concerning governance inspired and informed the drafting of its core provisions.

In the UGA and TU proposal, two different approaches are being proposed for solving the problem of persistent poverty based on similar data gathered essentially from the same source (U.S. Census data on the region and opinions of people living and working in the region). What phenomena are responsible for this interesting divergence of perspectives on the problem and the solutions proffered? Which of these proposed solutions is based on the right formulation of the problem? The next section of the paper attempts to answer the first question. The second question will be answered in the penultimate section of the paper.

Although there is no heuristic device that guarantees a single right formulation of an ill-structured problem such as persistent poverty, the final section of the paper will attempt to explain a process that will increase the likelihood of formulating the right problem. In attempting to formulate a problem to represent a complex problem situation such as persistent poverty in the BBI, it is easy to misrepresent the problem situation when dealing with multiple self-interested stakeholders. Therefore, it is quite likely that neither of the two formulations of the problem is as accurate a representation of the existing problem situation as they could have been.

COMPLEXITYAND PROBLEM REPRESENTATION

Social problems such as poverty, are ill-defined or ill-structured problems. Ill-structured problems are the ones most often encountered in everyday situations and professional practice [8, 11, 15, 16]. They are defined as having conflicting goals, having complex patterns of relationships with other problems, requiring the application of multiple disciplines in crafting and implementing solutions, having no single best solution for their resolution, having multiple criteria for evaluating solutions, and having solution conditions that are not well specified [7, 8, 9, 15, 16].

Because ill-structured problems cannot be specified in a unique manner, and conditions for their solution are not well known, stakeholders enjoy the freedom of offering their own preferred solutions based on their peculiar world view. These many possibilities of representing the problem, in turn, have the potential to generate many different proposals for solving the problem. Furthermore, a social problem is not an objective phenomenon such as a problem in chemistry, physics or mathematics. A problem in the sphere of social endeavor is a subjective construct; created from the interaction of people with a "problem situations." In this sense, a problem only becomes manifest when people express their dissatisfaction with a particular situation or certain elements of it [7, 9, 15]. For instance, the demographic and socioeconomic data that [2, 22] used to define poverty in the Black Belt counties of southeastern states of the U.S. do not, in themselves, represent the problem of persistent poverty. These data only describe the problem situation. The problem of persistent poverty arises as a result of the experience of BBR residents with the situation as it exists in the BBR counties.

Persistent poverty is a system of interacting sub-problems as the priority areas shown in Table 1 illustrate. Since complex problems cannot be specified in a unique manner and conditions for their solution are not well known, this inherent ambiguity gives stakeholders the freedom to offer their own preferred solutions. Thus, the more complex the problem is, the greater the number of ways in which it can be represented. These many

possibilities of representing the problem, in turn, have the potential to generate many different proposals for solving the problem, which explains the different legislative acts —SEED, SRC—proposed to address persistent poverty in the BBR.

Because a problem is a social construct (an abstraction derived from a "problem situation" through the interaction of people with that situation) then a natural corollary of this proposition is that different individual observers or groups will tend to view the same problem situation differently. Thus, there are likely to be as many representations of the problem as there are stakeholders with different experiences, education and values associated with a "problem situation". Therefore, in the case of the problem situation of persistent poverty in the BBR the different stakeholders with a vested interest in the problem will likely represent the problem situation differently, and, as a result, proffer quite different solutions for solving the problem.

In sum, the complexity of the problem situation and the fact that a problem is a social construct are two factors that offer a plausible explanation for the different outcomes (the two pieces of legislation that different approaches for addressing persistent poverty in the BBR) resulting from the efforts of TU and UGA, even though they both used essentially the same data to describe the problem situation.

DEFINING THE RIGHT PROBLEM A DEFENSE AGAINTS TYPE III ERROR

The second question at the end of the first section asked: Which of these proposed solutions is based on the right formulation of the problem? To answer this question, the next section of the paper describes the key aspects of the process of problem formulation that impinge on formulating the right problem, and describes strategies for improving the odds of identifying the right problem from the problem situation.

The right formulation of the problem is one which captures all the salient features of the problem situation, which accurately represents the problem situation. A Type III error occurs if the problem, as formulated, fails to represent the problem situation. In more specific terms, a Type III error is committed when a problem is formulated based on a representation of the problem situation that is incorrect, incomplete, or inappropriate [9]. When this situation occurs, solutions are developed that target the wrong problem. According to George [9], an incorrect representation of a problem fails to recognize any of the elements making up the problem situation, for instance, "poverty is caused by religious beliefs." An incomplete representation ignores several elements of the problem situation (poverty is caused by laziness); an inappropriate representation fails to consider elements of the problem situation important to the targeted stakeholders (poverty is caused by lack of political savvy). The occurrence of a Type III error in planning or problem solving is due primarily to incomplete or inappropriate representations of the problem rather than an incorrect one [9].

In the case of the BBR, formulating the problem given the problem situation of persistent poverty would entail designing a heuristic process that ensures that problem solving is more participatory and includes a wide variety of perspectives relevant to the problem situation. It would also involve employing techniques of dialectic discourse to pit competing perspectives against each other in order to force the winnowing

and synthesis of ideas to arrive at the most comprehensive and plausible formulation.

In the BBR, the pool of stakeholders would include: policy professionals, technical experts, government agencies, nongovernmental groups, businesses and, most importantly, the CBOs who represent those who have suffered most severely and who will be beneficiaries of programs designed to address the problem. Several arguments support expanding participation in the problem formulation process. For example, [9] argues that taking steps to expand the pool of ideas bearing on the problem situation is probably the best way available to defend against Type III error. Small [19] suggests that stakeholders, especially those affected by the problem situation, have unique knowledge about the problem situation that can be of great value in defining the problem. One advantage of a participatory approach is to ensure that the values and preferences embodied in society's policies align more closely with the values existing in the wider society [18]. Thus, those problem formulation initiatives that broaden the base of participation are more likely to identify the right problem and reduce the possibility of a Type III error. There is also an ethical dimension to community problem solving such as the Black Belt initiative. A key aspect of this ethical dimension is recognizing the rights of citizens to have a measure of control over decisions that will have lasting impact on their lives [3]. Apart from the imperative of including the views of stakeholders in the decision-making process, public decision-making entails a moral imperative with respect to its process and purpose [4, 5, 6]. [5] argues that an organization is a moral agent – not only in terms of the products it produces, but also with respect to the purpose it seeks to fulfill and the processes it employs in attaining that purpose in other words, the end or goal of the organization, as well as the means employed in pursuit of the purpose, must be good, morally desirable and just. George [9] reminds us that although participation is the best defense against a Type III error, it does not guarantee completeness or appropriateness of the problem formulated from the problem situation. Additionally, any effort to increase participation increases the complexity of the formulation process because of the sheer number and diversity of participants as well as the increased quantity of information that needs to be processed. Therefore, if the benefits of participation in reducing the likelihood of a Type III error are to be realized, as well as meeting the ethical requirements suggested above, a systematic and purposeful method must be employed to manage the complexity inherent in initiatives designed to solve complex problems.

As participation increases, special techniques must be employed to ensure efficient management of the formulation process to minimize losses in the quality of group interaction and maximize the benefits accruing from high levels of participation in the formulation process. Dunn [7] describes several techniques or normative methods for structuring complex problems to reduce the occurrence of a Type III error.
Among these are: assumptional, hierarchical, classificational, multiple perspective and boundary analyses. But even with the rigor of these methods, Dunn enjoins us to be mindful that these methods do not guarantee the definition of the right problem. The only way to check the validity of a particular problem formulation or problem structuring exercise is to implement the solution based on the formulation of the perceived problem [17].

Regarding the empirical evaluation of normative methods of problem formulation, our search of the relevant literature has turned up very little recent work in this area. However, earlier work on the evaluation of the efficacy of normative methods of problem formulation have produced mixed results; George [9] reports that some studies have shown that normative techniques have improved the problem formulation abilities of individuals and groups while others have shown conflicting results. Nonetheless, this lack of positive and unequivocal support for the problem formulation process should not detract from its value as a heuristic device for identifying the right problem from a problem situation. The value of normative methods of problem formulation is that the process offers a theoretical framework for developing procedures for evaluating and progressively improving problem formulation methods. Though not flawless, it is possible to judge the quality of the problem formulation process based on factors such as the number and diversity of stakeholders engaged in the process, the extent of the search for competing ideas or perspectives on the problem situation, application of appropriate problem formulation methods, and the effort made in preparing stakeholders to participate in the process.

Given the preceding discussion, it is not possible to give a definitive answer to the question previously asked: Which formulation of the problem is the best representation of the problem situation in the BBR? In order to decide, data would be needed from the implementation of solutions developed from the studies conducted by TU and UGA, which served as source documents for drafting of the proposed legislations, i.e. the SRC, and SEED Acts. Although it is not possible to make a definitive judgment without hard empirical evidence, it is still possible to make a preliminary assessment of the extent to which each study represented the problem situation based on the quality of the formulation process each employed.

In the case of TU and UGA there were two parallel processes, each focusing on a different stakeholder groups, TU focused on CBOs and UGA on business, government agencies, and regional development agencies. The separation of key stakeholders into different groups did not allow for the pitting of rival ideas against each other, for the questioning of assumptions, and the checking of errors in an interactive group process. Failure to bring both groups together to resolve differences precluded the use of normative methods that could have marshaled the differences between the groups to produce a creative solution. This shortcoming resulted in TU and UGA supporting different representation of the problem (See Table 3 below).Tuskegee University's representation of the problem situation showed evidence of incomplete representation – excluding the perspectives of business, government agencies, and non-governmental agencies. UGA's representation showed evidence of inappropriate representation of the problem situation, excluding concerns of CBOs about governance structure which is important to the target group. Instead, relied on and emphasized the perspectives of a cadre of academicians, civil servants, regional development agencies, and professionalized NGOs. TU, in setting out in specific terms these problems that the community experienced, was clearly identifying a set of core values for the proposed commission — unambiguous strategic beacons that would guide the commission in achieving its overall goal of alleviating persistent poverty. These problem issues were more than mere priority or strategic markers; they represented the path that communities believed would lead them out of persistent poverty into prosperity. They were not mere abstract categories specified by some technocrat. The specificity of the areas indicate that they are part of the lived experience of the

stakeholders — they are the deficiencies felt and experienced by stakeholders as part of their everyday existence.

Table 3. Comparison of TU and UGA Interpretation of Problem Situation on Four Issues

Issues	TU	UGA
Governance	Participatory with community representation	Modeled after the Appalachian Regional Commission, no community participation
Jurisdiction	Eleven Southeastern Sates	Seven Southeastern States
Strategic Areas	Community planning, Education, Access to capital, and Community economic development (Expenditure on infrastructure limited to 25% of commissions budget)	None identified
Sources of Input	Primarily community-based	Primarily academia, government agencies and NGOs

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CONCLUSION

Preliminary evidence would seem to indicate that efforts to address persistent poverty in the BBR are plagued by Type III

error. This is probably due to the failure of leaders to recognize the complexity of the process and the requirements for managing the process to reduce the likelihood of a Type III error. For example, the participation of large numbers of self-interested groups and individuals will always lead to groups behaving to protect their interests. This is essentially a collective action problem, which requires resources and organizational capacity to manage it, and channel differences in perspectives into productive problem-solving. The other problem was the tendency to focus on crafting a solution even before the problem was adequately defined. The pressure to respond to the terms of reference within a short time frame made it difficult to devote meaningful time to problem structuring. The propensity to rush headlong into formulating a solution before the problem is adequately understood and defined is usually the primary source of a Type III error. The result of this haste to prepare a solution is a solution that is designed for the wrong problem. Here, Ackoff's [1] cogent remarks are quite instructive: "Successful problem solving requires finding the right solution to the right problem. We fail more often because we solve the wrong problem than because we get the wrong solution to the right problem."(p. 8). Thus, one way to avoid a Type III error is to ensure that enough time is invested in identifying the right problem.

RECOMMENDATIONS

The essential first step in solving complex problems is to develop an accurate representation of the problem situation in order to reduce the likelihood of a Type III error. To achieve these goals practitioners should design a problem-formulation process to: foster trust, participation, mutual respect, free access to information related to the problem situation and to the wider context in which the problematic situation is situated.

Participants should be educated to become knowledgeable about and fully engaged in the formulation process. All stakeholders should be fully involved from the very beginning in setting the ground rules for conducting dialogue and in determining what data will be needed, how this data will be collected and by whom and how the data will be processed. A serious source of contention in the problem-solving process is usually about whose data is being used and how the data was generated [14].

A critical feature of any collaborative effort involving diverse groups is the selection of a process facilitator or a convener — the individual responsible for bringing the groups together. Experience with the Guilford Crisis Resolution Council (GCRC) and the United Way of Greensboro's effort to resettle survivors of Hurricane Katrina from New Orleans in Guilford County N.C. indicated that a critical role in a collaborative problem solving effort is that of a convener. It is important that it be someone with sufficient respect and influence among the members of the group to command their trust and assert leadership influence through consensus. In the case of the GCRC, the convening agency was the Greensboro United Way, which welded together over 40 community-based organizations and state and federal agencies into a harmonious working group in a very short period of time to address a very complex problem. The participants indicated that setting ground rules together, creating an atmosphere of trust, mutual respect, and transparency in conducting the business at hand, and in sharing information were critical to the success of the group working together.

Selecting the appropriate problem structuring technique for guiding dialogue is critical to airing all perspectives and in processing the multitude of perspectives that will be generated about the problem situation. Resolving conflicting ideas does not mean that everyone agrees with the final outcome, or that a useless nondescript compromise is reached in which result is a hodgepodge of everyone's idea. To handle conflicting ideas in this situation and still nurture creativity is the essence of communicating ethically. Ethical communication is a continual requirement to exercise moral judgment in decision-making to ensure that morally correct outcomes are realized. In participative decision-making, there are no overarching moral principles that inform all judgments, a "collaborative" employing the participative decision-making model must become "communities of discernment" where freedom and creativity are focused on searching for what is right and just in an atmosphere of conflicting value positions [4, 6]. In such instances Habermas [10] suggests that conflicting value positions can be resolved through the development of appropriate search procedures that will enable the attainment of consensus without converting any group to the value position of other groups. This means that dialogue and search in an atmosphere of respect creates understanding and respect for a competing point of view and an appreciation for the solution reached through the effort of everyone. This process builds what is [12, 13] classify as: (1) social capital which is trust and long term relationships; (2) intellectual capital, which is mutual understanding, shared perspective of the problem, and agreed upon data; and (3) political capital, which is the ability to work together for agreed ends. They believe that achieving consensus under such nourishing conditions promotes high-the development of innovative strategies and high quality agreements. The GCRC case demonstrates that it is possible to bring large numbers of diverse groups together to work in harmony if a nurturing and facilitative atmosphere is created, and if groups are led to commit to the process and time and resources are dedicated to planning the process.

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