

MEASURING ECOLOGICAL VALIDITY: A THEORY-BASED ASSESSMENT OF  
ECOLOGICAL VALIDITY IN COMMUNITY PSYCHOLOGY RESEARCH

BY

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To my incredible and heroic wife Danica, without whom most of my ideas would remain  
trapped inside my skull

and

To J. R. “Bob” Newbrough, who has been a tireless inspiration, sounding board, and  
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## CHAPTER I

### INTRODUCTION

Ecological theory – an oft-neglected tenet of community psychology (CP) – is central to the conceptualization of community issues. Although ecological theory has been increasingly elaborated since Kelly (1968), few attempts have been made to significantly expand adherence to ecological theory -- making accountability to ecological validity scarce. Moos (1976) reminds us that an integrated perspective of humans in their environment is central for behavioral, social, and biological sciences. Systems must be seen as integrated wholes – wherein all parts and aspects are interdependent. A change in one element of a system will change other elements, perhaps unintentionally or invisibly (Jager & Slotnick, 1982); immediate and proximal gains may cause long-term, distal harm – thus ecological thinking is intrinsically sensitive to temporal and spatial dimensions of change.

There is often a disconnect in community psychology between ecological theory and the use of methods that adequately capture ecological context (Luke, 2005). Traditional methods available in the social sciences – especially psychology – are designed to capture individual level data or aggregates of single level data; thus, using these methods is problematic for researchers trying to capture the relevant ecological variables in a system. Luke (2005) states that, “...the decisions we make about the tools we use in community science say something about the values we hold as community scientists” (p. 187). Traditional statistical methods like ANOVA, regression,

psychometrics, correlation, and categorical statistics – used more commonly in CP than contextual methods (Luke, 2005) – can be utilized to measure and understand multiple levels of an ecology, but methods designed specifically to do so are a better match to ecological theory and lead to the evolution of ecological methodology. Regardless of which tools are used, methods are an essential element on the path from ecological theory to empirical systems knowledge.

There are myriad theoretical and practical reasons why an integrated ecological perspective has not been more widely adopted. One major reason is its complexity; Keller and Golley (2000) note that the complexity of the ecological perspective is its greatest strength, although this complexity makes it harder to incorporate into theory, research, and action. Ecology is heralded as a response to the ills of industrialism specifically because it takes the complexity of systems into account. Second, traditions in research emphasize and reward contrived, individualized, behaviorally oriented work; in 1963, Roger Barker noted that, “[p]sychology has been so busy selecting from, imposing upon, and rearranging the behavior of its subjects that it has until very recently neglected to note behavior's clear structure when it is not molested by tests, experiments, questionnaires and interviews” (p.24). Another reason is that there has never been a comprehensive accumulation of ecological elements necessary to evaluate ecological validity, nor any means of measuring these elements. This thesis follows a path from ecological theory to a concrete instrument for measuring ecological validity.

Beginning with an introduction to ecological theory, an explanation of ecological validity, and a brief history of ecological thought, I examine the adaptation of the ecological perspective to community psychology and then outline several additional

ecological concepts that add significantly to understanding community phenomena from an ecological perspective. I then develop an evaluative framework to determine ecological validity in a systematic and comparable way. A sample from published community psychology research articles that claim to be conceptualized, executed, or applied ecologically are evaluated with this framework to determine the status quo of ecological validity in the field of community psychology. As a core theoretical contributor to community psychology, it is essential that ecological tenets be systematically applied to increase research validity and to further inform the ecological paradigm through empirical testing. Although a commonly used heuristic device for the conceptualization of behaviors, pathologies, and research triangulation, social ecological theory has not been comprehensively cataloged, applied, or tested. Moos (1976) made admirable attempts, noting the following:

The arrangement of environment is probably the most powerful technique we have for influencing behavior... every institution in our society sets up conditions that it hopes will maximize certain types of behavior and certain directions of personal growth... There is, of course, serious disagreement about which effects should be maximized and which environmental conditions should maximize them. (p. 4)

A theory's heuristic ability is essential, but without rigorous testing and applied methodology, it will remain academic speculation. This thesis will evaluate the ecological validity of community psychology research, create a tool for evaluation of future research, provide direction for increasing ecological validity, and present means for the systematic and continued testing of ecological theory.

### *Ecological Theory*

Since the 1930's, psychology has been adapting the model and principles of natural ecology to better understand human behavior and pathology (Dunham, 1940). Although Kurt Lewin struggled throughout his career to bridge the cognitive dissonance between his ecological views and his more rigid views of science and psychology, his pioneering work set the stage for the integrative work of other theorists and researchers (Barker, 1963). The adaptation of ecology to human circumstances, often referred to as *human ecology* or *social ecology*, assumes that there is continuity between all people and their environments and seeks to understand the development of community and society from a transactional perspective (Hawley, 1950). This development came at a time when field biologists left humans out of their thinking and sociologists had shied away from systems thinking (Barker, 1963).

Much like natural ecology, human and social ecology attempt to understand the inhabitants, structure, change, and development of a particular setting with the assumption that all of these elements are connected and cannot be abstracted from one another without the loss of important information (Hawley, 1950). Ecological theory attempts to take all relevant units of analysis into account, exploring often-disregarded foci. Since these units are often not representative of individuals or tangible objects traditionally measured in research, they are difficult to observe and measure – although extremely important in tracing ecological relationships. Ecological theory is not universally accepted, but has remained a constant and useful system of concepts for understanding the human condition. Ecological thinking rightfully pervades almost all aspects of community inquiry, granting a unified vision for the study of phenomena of

concern to the community psychologist. Capra (1982) captures the core and future of ecological thought succinctly:

[This] new vision of reality... is based on awareness of the essential interrelatedness and interdependence of all phenomena – physical, biological, psychological, social, and cultural. It transcends current disciplinary and conceptual boundaries and will be pursued within new institutions. At present there is no well-established framework, either conceptual or institutional, that would accommodate the formulation of the new paradigm, but the outlines of such a framework are already being shaped by many individuals, communities, and networks that are developing new ways of thinking and organizing themselves according to new principles (p. 265).

Interdisciplinarity and research dialectics – as described by Capra (1982) – unclog disciplinary stagnation and lead to better research and resource efficiency (Bry, Hirsch, Newbrough, Reischl, & Swindle, 1990). We require greater recognition of this “social system complexity” (Gross, 1966, p. 178); instead of linear thinking we must think in terms of *multiple feedback loops* as the interrelation within complex and dynamic systems, *coupled feedback* within cooperating and or competing systems, and *feedforward loops* which are based on reciprocal expectations of future behavior (Gross, 1966).

Keller and Golley (2000) outline six components of the *ecological worldview* – synonymous with ecology – which emphasize the interaction and connectedness between all things: 1) Ontological interconnectedness: All biotic and abiotic things are integral parts of the biosphere; 2) Internal relations: The identity and essence of any thing is an expression of interrelationships and context; 3) Holism: To understand a part or the whole of the biosphere, the relationships between parts must be understood, rather than merely the parts; 4) Naturalism: All life forms, including humans, result from the same natural processes; 5) Nonanthropocentrism: Due to interconnectedness, non-human

elements of the biosphere have more than instrumental value/utility; 6) Human damage: Humans have caused severe negative impacts through pollution and extinction, making environmental ethics necessary.

More than mere theoretical musing, ecology offers a synthesis of the dialogical relationships existing between otherwise artificially separated elements. This synthesis has the ability to make science and inquiry more relevant (Cornwall & Jewkes, 1995). Odum (2000) demonstrates the need for ecologically designed research in order to capture emergent properties and understand the energy flow and budget of living systems. These emergent properties exist in natural biology and in human systems. Without ecologically valid research, the piecemeal study of parts will never see emergent qualities (Odum, 2000). In order for psychologists to leave the laboratory and find emergent system properties they must use the methods and data of other disciplines (e.g., climatologists, geologists, geographers, anthropologists, sociologists, etc.), essentially an interdisciplinary approach (Sells, 1974); natural phenomena are too dynamic for a single researcher operating in a single discipline to capture. Synthesizing observed elements is not just an interdisciplinary pursuit requiring collaboration between previously discrete fields of study, but integration within single minds (Campbell, 1969). The move toward ecological research not only lies in methods and ecologies, but in the evolution of researcher's minds, world-views, and collaborative abilities.

Many researchers (even ecologically-minded ones) utilize tools designed for experimental, positivist research and adapt them as best they can to their contextual methodology. Barker (1978a) explores this contradiction further:

One of the purposes of experimental techniques is to arrange the data that issue from data-generating systems so they will fit prevailing machines, formulae, and

concepts. So we have forced-choice tests, five-point scales, normalized distributions, equated control groups, and so on. These are not sins. They facilitate the purposes of experiments: to solve problems and test hypotheses that the investigators bring to the data. But if one's intention is to explore behavior and its environment, the phenomena themselves must dictate the choices, the scales, and the distributions. It is our experience that psychological measurement experts do not know statistical and analytical techniques for dealing with 'natural' phenomena, even where they are available from other sciences. We need mathematical innovators and we need textbooks and handbooks on data-reduction methods culled from quantitative botany, demography, geography, physiology, and economics. When those who work on eco-behavioral problems do not have the analytical tools they need, they inevitably cast data in the molds of experimental psychology, molds that often destroy the essential nature of the phenomena they are investigating. (p.46)

Ecological theory is also used as a framework to determine the sites and methods for triangulation of research results. Triangulation logically and statistically compares multiple measures to increase the validity of results (Bryman, 1984; Morse, 2003). Triangulation can enhance the generalizability of research, allowing the application of theory and methods to other settings (Marshall & Rossman, 1995). An ecological perspective is an ideal lens to build a triangulated methodology; ecological perspectives naturally contain the elements necessary for combined methods (Rank, 2004), revealing complimentary routes to inquiry, additional – and likely novel – insights into the research focus, increased validity due to contextual understanding, and the most complete vantage for understanding inconsistent or contradictory data. Barker and Pistrang (2005) explicate and critique another model of triangulation called *Methodological Pluralism* that benefits from ecological thinking. Pluralism embraces the many relevant possible methodological avenues for exploring phenomena (Barker & Pistrang, 2005), which is highly congruent with ecological methodology.

Ecological theory asks the researcher to do more than change their view of observed phenomena, but also requires them to examine their place within the ecological

topography of what they observe. This poses more than methodological difficulties if one understands one's immersion into a larger ecological topography. Most researchers have traditionally abstracted themselves from the research process. Those who do reflect upon their position find themselves with more power, prestige, and resources than research participants (Babbie, 2005). This is not only difficult to rectify, but also difficult to face as a conscientious researcher. Ecological thinking also takes into account the complexities of the researcher's standpoint, as well as the complex nature of what they observe. Following the behavioral-ecology model of Jager and Slotnick (1982), ecological research, "...represents a *merging of ethics and practice*, as it espouses relatively specific values to inform action" (p. 11). Because researchers often have personal connections with the settings they observe – a fact that is usually ignored or unacknowledged by traditional research – many ecologically-minded researchers engage in more participatory and action focused research to act out their values and connections with contexts of interest.

### *Ecological Validity*

The term *ecological validity* has been used in psychological literature almost as long as ecological theory has been a part of psychology. The way that ecological validity was defined in psychological articles before the 1970s would be almost unrecognizable to modern community psychologists. Although the term existed previously in the literature, Bronfenbrenner (1979) popularized and redefined ecological validity into the concept familiar to community psychology literature. Ecological validity is defined by Bronfenbrenner (1979) as "...the extent to which the environment experienced by the

subjects in a scientific investigation has the properties it is supposed or assumed to have by the investigator (p. 29).” This definition has almost always been applied to experimental settings not commonly used in community inquiry. Reppucci (1990) holds that, “...there is no agreed-upon definition of *ecological validity* ...” (p. 160) and believes that ecological validity is embraced by many community psychologists in the abstract but is adhered to by very few. Reppucci (1990) also states that ecological validity combines multiple and ongoing interactions at multiple ecological levels and applies the study of people or groups in natural contexts rather than contrived settings – differing from Bronfenbrenner's (1979) emphasis on more traditional developmental research and laboratory experiments. These differences may spring from the status quo of ecological validity at the time of publication – as ecological thought had expanded significantly from 1979 to 1990. The definition of ecological validity has – for pragmatic reasons – expanded in community psychology far beyond laboratory and contrived experimental settings. Also, analogous to Newbrough's (1995) *Third Position*, ecological researchers must move beyond the position of purely imbedded community member or objective, abstracted researcher to a reflective synthesis of the two – or “reflective-generative practice” (p. 25). Kingry-Westergaard and Kelly (1990) add that, “[t]he ecological approach focuses on the behavior of persons in social settings related to the social construction that the participants, both observer and observed, create of their own context” (p.28). This means that a truly ecological perspective applies to research phenomena *and* the researcher's context. Additionally, Christens and Perkins (2008) note the importance of the temporal aspects of context, extending *impact on* research to *impact from* research. When tracking environmental elements – both elements

contributing to and resulting from the research process – ecologically valid research should move beyond capturing psychological, social, and imagined environments to actual real-world elements of a system. Including these important new elements, a comprehensive definition of ecological validity has been devised: *Ecological validity is the extent to which the research process assesses the relevant environmental elements and processes affecting the phenomena and/or participants of focus, the extent to which the researchers assess their own power and position within the ecological topography of the research environment, and the extent to which the researchers assess the inherent and potential ecological impact of the research process and results.*

#### *Application*

Contextually minded application of research can yield ecological validity over and above the process of research itself. Whether publication, policy change, best practice, consciousness raising, etc., there are many aims for research in community psychology. Each of these research aims has effects on various levels of the ecological topography of the participants and community. Beyond the participants, research can have far-reaching effects on similar communities, as well as unknown effects. Community researchers have the responsibility to weigh the ecological impact of their work, with a mind to maximize the potential positive impacts and minimize negative impacts through the application of their research and its results. Although it can be argued that having the least possible impact on a setting is most ecologically sensitive (as is valued in field biology), significant impacts on people, neighborhoods, and communities already exist due to government, commercial, and social forces that have no

interest in minimizing their impact. These forces are no more or less “natural” than research interventions and often impinge upon community conditions without significant opposition from actors sensitive to the well-being of the community and its inhabitants. The following conceptual model can be used to track the ecological connections between the researcher and his or her environment.

By tracking the ecological impact of the research *input, process, and output* (IPO), a more complete vision of ecological validity can be obtained. It is not enough to merely create a generalizable research setting; the researcher is responsible to the participants, their community, and their society. The IPO model first looks at the relevant levels of the ecological topography that have influenced the setting of research. The level of research conceptualization, data collection, analysis, and phenomena may differ, with significant consequences if these levels are mismatched (Shinn, 1990). It is important for these levels to be intentionally maximized for their purpose – even if they are not all present at all levels. Certain research questions may pragmatically require emphasis at some levels of an ecology at the expense of others, due to resources, methods, or access; necessary depth of research to achieve pragmatic ends certainly cannot be sacrificed to reach greater breadth of ecological validity for its own end. Then the research process must be examined to determine the place of the research itself and the researcher amid the ecological topography of the setting. Researchers – whether in the academy, organizations, corporations, or government agencies -- may have more power than whole communities, so their position cannot be abstracted from their surroundings. The walls of the university or government office do not insulate researchers from affecting the world; they likely only insulate the researcher from *feeling* the effects. Lastly – as outlined

previously – the output of the research is examined. What are the intrinsic effects of the research on the ecology and what are the potential effects of the research. A researcher's ability to track these impacts increases the ecological validity in great measure.

Analogous to the IPO model, temporal and conceptual qualities of research can be traced from their research conceptualization (see Katz and Kahn, 1978), their measurement of antecedents, their action or intervention, and their evaluation of the impact or outcomes of the research process. These categories will be elaborated later and are used for the measurement of ecological validity.

### *Measuring Ecological Validity*

Ecological and environmental models for behavior emerged in part due to frustration with personality models' inability to predict behavior across multiple milieus and with varied criterion of validity (Moos, 1973). Therefore, developing environmental and ecological models is an important part of the ongoing process of understanding, predicting, and changing behavior. Ecological validity can be tracked in every process of research and lends a critical lens to understand the context of behavior. Within this thesis, the guiding theory, methods, methodology, and application of community psychology research will be evaluated using markers based in major theoretical publications in the field, as well as adaptations proposed in this paper. The creation of an evaluative framework and the following application of the instrument aim to answer the following questions: a) What are the essential components of ecological validity? b) Can ecological validity be effectively measured? c) How ecologically valid is community psychology research? d) How can the ecological validity of research be raised?

These questions can best be answered by turning to the roots of ecological thinking and tracing those threads to contemporary research. This process highlights the context and progress of theoretical and empirical steps that have occurred and still may be reached. It also highlights some of the pitfalls of applying ecological theory to our research and values.

Due to the exploratory nature of this research, there is no benchmark of ecological validity with which to compare results. Although this may seem to diminish quantitative possibilities, the intent of this work is not to set a normative standard for levels of ecological validity; this research will provide a baseline for comparison, a starting point for a path of increased validity, and, most importantly, a tool for planning ecologically valid research. It is not assumed that a single article or research project can reach “maximum” ecological validity, but rather, in the tradition of Campbell (1969), I hope that this paper allows researchers in pursuit of ecological research to coordinate their efforts within and across research efforts to attain greater understanding of systems and system change.

## CHAPTER II

### ORIGINS OF ECOLOGY

#### *Historical Origins*

The term *ecology* is derived from the Greek words *oikos*, meaning household, and *logos*, connoting reason or meaning – adapted in science to express the systematic search for meaning (Miller, 2000). The first known use of the word is by the German biologist Ernst Haeckel, who originally coined the term as *oekologie* in 1866 (Milner, 1993). Haeckel was an ardent follower of Charles Darwin, spreading the message of evolution science with religious zeal. The tenets of Darwinism, especially the focus on environmental effects on organisms, played well into ecological thinking. Unfortunately, Haeckel's creation of ecology did not keep him from falling prey to a common folly of Darwinists; Haeckel pioneered Social Darwinism and Eugenics as a solution to many of Society's ills. In the end, the predictor of the existence of *Java Man* and the pioneer of ecological theory denied the influence of context on individuals and groups that he deemed to be inferior (Milner, 1993).

To further define ecology, the difference between geography and ecology is defined by McKenzie (1982) as the difference between place and process – geographically speaking, location signifies position on the earth's surface while ecologically speaking, location signifies position within a spatial (or, I would add, relational) grouping of interacting and related humans or human institutions. This interrelation has been expanded since McKenzie (1982) – due to technology,

globalization, and our understanding of the boundaries of influence for humans and human activity. Still, between Park's (1982) process orientation (among others) and McKenzie's (1982) relational-spatial orientation, the ecological perspective takes on the form of a dynamic view of humans in context.

As in Haeckel's case, many scientists have denied the importance of ecology beyond the study of non-human organisms and their surrounding environment for the advancement of biology. Although adopted simplistically for early environmental movements, humans were kept out of the natural ecology picture (and in many cases still are) until the Chicago School of Sociology began creating a unified ecology that included humans in the existing ecological theory available at the time (see the *Social Ecology* section later in this paper). Beyond the new social ecology of the Chicago School, Norwegian philosopher and mountaineer Arne Naess introduced the concept of *deep ecology* in 1972. Deep ecology posits a model of ecology that imbeds humans as merely a part of ecology – equal in value to other biota at best – not a unique and separate observer of natural processes (Naess, 1976/1989). This position includes knowledge of – and responsibility for – every element and process of the Earth, without regard for its importance to humanity (Naess, 1976/1989) – often relegating humans and their eco-meddling to near virus status.

Murray Bookchin's (2003) social ecology (further outlined in the *Social Ecology* section in this paper) scathingly rejects the position of deep ecology, as it ignores the social and hierarchical roots of ecological crises. Bookchin (2008) rails that, “[t]he very words 'deep ecology' clue us into the fact that we are not dealing with a body of clear ideas, but with an ideological toxic dump” (p. 244). Bookchin (2008) asserts that humans

are a part of ecological evolution – but are set apart by our ability for reflection and our ability to create culture. Bookchin (2008) further denigrates Naess by stating that, “...deep ecology is the fast food of quasi-radical environmentalists” (p. 248). Whether holding the extreme view of deep ecology, the position of pure social scientist, or somewhere in between, researchers are part of what they observe and must act accordingly with sensitivity to the interconnectedness and worth of the entire biosphere.

### *Philosophical Origins*

The origins of scientific philosophy are also the origins of reductionistic and anti-ecological thinking. White (1998) notes that Aristotelian *deus ex machina* places God as the *first efficient cause* of the universe, removing the divine from the continuing processes and materials of the earth. Thus, the mind (a la Descartes) is outside the body (ego ex machina) and the quest to become godlike for humans makes them strive to separate from the earth and their own body. This removes the dynamic praxis of being in the world and in one's body – thus leading to a lack of respect and connectedness.

Tracing scientific philosophy from its origins, Altman and Rogoff (1987) outline four perspectives in science that can be seen as a stepwise evolution in scientific philosophy. These perspectives are: a) *Trait*, b) *Interactional*, c) *Organismic*, and d) *Transactional*. Each perspective is examined in the following passages:

*Trait*. The *trait* perspective is based on essentialism and stability. From this perspective, any object or organism has an unchanging and stable essence. A person or thing is unchangeable and scientific inquiry should be to understand its essence, rather than to understand or promote change. The only viable unit of analysis is individual

objects and organisms. Much of pre-Copernican science was conducted from the trait perspective.

*Interactional.* The *interactional* perspective is based on separate, discrete interacting pieces. From this perspective, objects and organisms are unchanging and stable, but the interactions between them yield scientifically meaningful information. The units of analysis in the interactional perspective are individual objects and organisms and simple relationships based on physical measurable properties. An example of the interactional perspective is Newtonian physics.

*Organismic.* The *organismic* perspective is based on holism and development. Objects and organisms are seen as developing entities existing within a changing context. Biotic and abiotic entities and elements are constantly changing and interacting with their environment. Phenomena and elements of a system cannot be abstracted from their context without changing their properties. The units of analysis in the organismic perspective are individual objects and organisms, complex relationships between different entities, and the discrete systems that include these elements. Non-contemporary ecology and Darwinian biology are examples of organismic perspectives.

*Transactional.* The *transactional* perspective is based on *aspects* of complex systems. Objects and organisms are seen as parts of transcendent relationships without boundaries that are constantly interacting and developing. From the transactional perspective biotic and abiotic elements are an ever-changing part of numerous cycles. Relationships between elements – including sub-elements and energy – are just as viable as objects or people for study. The units of analysis for the transactional perspective are individual objects and organisms, complex relationships between different entities,

discrete and continuous systems, temporal qualities, psychological properties, and the transcendent qualities of systems of all sizes. Capra (1996) describes these qualities succinctly:

Their essential, or 'systematic,' properties are properties of the whole, which none of the parts have. They arise from the 'organizing relations' of the parts—that is, from a configuration of ordered relationships...Systemic properties are destroyed when a system is dissected into isolated elements. (p. 36)

Contemporary ecology is based in the transactional science perspective. Ecological theory originated in – and potentially co-generated – the organismic science perspective. The transactional science perspective is synonymous with ecological theory. Altman and Rogoff (1987) make no direct value judgment on one perspective over another, but note that most of modern science operates within the organismic perspective at best. Since each successive perspective essentially contains the units of analysis found in the previous, the transactional science perspective would yield the most information with the most triangulation. Pragmatically, it is extremely impractical and improbable that researchers adopt methodology purely reflecting the transactional perspective. As science, theory, and technology progress, transactional science will become more practical and possible – although many factors other than validity and practicality govern the path of scientific investigation (Kuhn, 1996). As knowledge builds, researchers can continue testing transactional ecological models while utilizing ideal, full-scale ecological theory as a guiding frame of reference.

## CHAPTER III

### CONTRIBUTING SCHOOLS IN ECOLOGY

#### *Social Ecology*

Moos (1976) asserts that no clearly defined criteria exist for an ideal environment, especially considering divergent requirements. Although nomothetic principles are difficult to pin down, Moos (1976) outlines a specific value orientation when defining social ecology's mission as he sees it:

... a social ecological approach has an explicit value orientation: it is not simply an approach for science. It is also a humanistic approach from which to benefit mankind. A social ecological approach is dedicated to increasing the amount of control individuals have over their environments, and to the question of how environmental planners can plan environments and still avoid acting as agents of social control. It is dedicated to increasing individual freedom of choice in selecting environments. (p. 31)

Human ecology differs from natural ecology in several ways. First, humans are not as directly dependent on nature (at least nature not manipulated by humans) – as the relationship is mediated through other humans, due to local and global divisions of labor. Humans have also greatly increased their ability to act upon their environment, changing the character of what nature means. Structure in nature is determined by biology, physiology, etc. (Park, 1982) making humans appear different from other biota in that we assume that the structures of our society and world are determined by something that transcends biology. Bookchin (2008) still asserts that, “[t]he human species, in effect, is no less a product of natural evolution and differentiation than blue-green algae” (p. 251),

but we have specifically and instrumentally evolved to build culture and reflect on our existence.

Burgess (1982) also notes that social organization and social disorganization are analogous to metabolism – as seen in growth rates, acculturation into the “body” of a city, social problems as “disease,” etc. Human society is a structure or organization of control – directing the energy of its inhabitants. This may lessen competition and increase cooperation (Park, 1982), likely in order to increase competition (and decrease cooperation) with other species.

Moos (1974) outlines six approaches in methodology for studying human environments according to the social ecology perspective: (1) search for objective ecological variables by which environments may be classified (e.g., geographical, meteorological, architectural), (2) behavior settings, (3) organizational structure (e.g., size, faculty-student ratio, span of control), (4) describe the average background characteristics of individuals functioning in a certain environment (e.g., intelligence, mechanical ability), (5) psychosocial characteristics and organizational climate, (6) identifying reinforcement contingencies that maintain particular behaviors (functional analysis of environment). This comprehensive set of steps can certainly be utilized in community research to achieve greater ecological validity.

As evidenced by its fall from grace in sociology, social ecology and the ecological metaphor – at least, as asserted by the Chicago School – has gaps and flaws worthy of attention. The problem for ecologically minded researchers, theorists and practitioners can be summed up by Hollingshead's (1982) position that while humans are animals in nature, they are also a possessor of culture in a society – unlike any other

animal (we presume). This makes a direct, simple translation of natural ecology and field biology into human ecology a mistake. The human ecologists of the Chicago School projected the ecological metaphor to its *reductio ad absurdum* by assuming that ecologies are stable and should not be modified from their “natural” paths – leading toward the assumption that social change efforts are unnatural and doomed to failure.

According to Parson (2005), the Chicago School of sociology utilized natural ecology to espouse social Darwinism by stating that the poor fit their environment and gentrification is a natural process. This led the Chicago School to take the position that intervention to promote individual or community well-being went against the natural order of human ecologies and that cities are, “impervious to social reform” (Parson, 2005, p. 4). Unfortunately, the pioneers of ecological theory in the Chicago School ignored or misinterpreted one of the more important tenets of ecological theory, called the *disturbance hypothesis*, that assumes local equilibriums can and will be disrupted by forces existing in higher levels of nested ecological systems. In a non-human system, this “disturbance” might be a natural disaster (e.g., fire, earthquake, flood, etc.), mass migration, drought, or even human intervention. Each of these (and myriad other) disruptions can cause major changes to local equilibrium, resulting in new death, new life, and the potential for a stronger ecosystem. These disruptions affect human ecosystems as well, but other more uniquely human disruptions exist as well (and could be adapted to urban and social theory); border conflicts, changes in immigration laws, rapid gentrification, closed factories and mines, etc. can have serious effects on community equilibrium, while intentional disruptions like government unemployment programs, housing trust funds, faith-based hunger prevention, new education projects,

etc. have made major changes and still hold the promise of improving communities through the disruption of negative ecological trends. This theory does not denounce the order that can exist in a system; Barker's (1963) empirical work shows surprising amounts of self-organization and direction within settings – but such stability must not be seen as the only natural state for a system.

Hawley (1982) notes that social (or human) ecology also stalled intellectually due to isolation from related disciplines, clinging to particular concepts beyond their usefulness, and concept competition. Interdisciplinarity (and eventually, transdisciplinarity) is an important step toward relieving the binds that left human ecology in the past for sociology. Another weakness in social ecology noted by Hawley, (1982) is the assumption that consciousness and nature must be separated; to look for behavioral cause only outside of consciousness denies that consciousness is part of human nature. Ecological concepts must be applied in a more complex manner to sentient beings, rather than swept aside or applied in small-minded ways.

It is unfortunate that human ecological theorists and researchers from the Chicago School did not more fully understand natural ecology (or human's relationship with ecological connections) or this conclusion would have been avoided. Cultural context adds unique features to the human condition not accounted for in natural ecology. To ignore cultural context in favor of a biological one will never create satisfactory results and will nullify the adapted theory. Therefore, theory must be adapted into uniquely human terms, tested through action, then dynamically modified to create satisfactory human ecological theory. Additionally, the disturbance hypothesis accounts for social change quite elegantly and has been widely accepted in natural ecology. Disturbances

can actually lead to more diverse and stronger systems, as long as the disturbance is strong enough to prevent the development of dominance and not sufficient to cause regional destruction (Walker, 1989).

*Bookchin's social ecology.* Bookchin (2003) sees social ecology as a rational and coherent form of naturalism that avoids quasi-religious and positivist dogma (often found in biocentric views like deep ecology). Bookchin (2008) asserts that social ecology should critically unmask hierarchy and should be morally humanistic (while not degraded to humanism) – rather than misusing ecological concepts to further an unjust status quo. The mis-utilization of ecological concepts by ruling classes and academics should not be used as arguments against ecological thinking (Bookchin, 2008). In contrast to other traditions springing from natural ecology, Bookchin (2008) further delineates social ecology:

Social ecology accepts neither a “biocentricity” that essentially denies or degrades the uniqueness of human beings, human subjectivity, rationality, aesthetic sensibility, and the ethical potentiality of humanity, nor an “anthropocentricity” that confers on the privileged few the right to plunder the world of life, including human life. Indeed, it opposes “centricity” of *any* kind as a new word for hierarchy and domination... (p. 250).

The social Darwinism and Malthusian thinking that has arisen from the Chicago School and biocentric ethics is truly flawed if it does not take social hierarchy and economic structures into account; the fact that capitalism's emphasis on – and success with – unlimited growth means that reduction in population would not lead to diminished levels of production and resource use (Bookchin, 2003). Bookchin's (2008) social ecology celebrates the diversity and individuation of humans as the transformative process necessary to remake society and arrest the growth of totalitarian, anti-ecological trends in human society. Bookchin (2008) reminds us that, “[t]he primary question

ecology faces today is whether an ecologically oriented society can be created out of the present anti-ecological one” (p.251).

### *Developmental Psychology*

Bronfenbrenner (1979) further expanded the understanding and scope of ecological theory in psychology. He first applied ecological theory to human development, shedding light on the *nurture* side of psychological development. At the time, it was revolutionary thinking to move beyond individual and dyadic history and behavior to examine development. Bronfenbrenner (1979) also assembled the iconic human ecological representation of concentric circles expanding from the self (or ontogenetic level), consisting of: a) micro-system, b) meso-system, c) exo-system, and d) macro-system. The nested systems – each contained within the next level – could be used to visualize the contextual elements contributing to developmental paths and behaviors (Bronfenbrenner, 1979). As outlined previously, Bronfenbrenner (1979) also popularized the concept of ecological validity. In the interest of consistent nomenclature, pedagogical concerns, and comprehensiveness, I have amended Bronfenbrenner's (1979) classic levels to include: a) demo-system, b) micro-system, c) meso-system, d) exo-system, e) macro-system, and f) geo-system. Most importantly, this change reflects the addition of the geo-system, which represents the inhabited globe (or *biosphere*, a la Levine, Perkins, & Perkins, 2005) and the natural and social processes that transcend the traditional societal level of the macro-system. Also added is the demo-level, which subsumes the ontogenetic level of self, including individual biology, intrapsychic processes, etc. (See Appendix A).

Waring (1989) notes that the concept of an ecosystem is dimensionally undefined; it may be anything from a handful of soil to the entire Earth's biosphere. The defining of an ecosystem's boundaries depends on the phenomena of interest, time-scale, etc. and may cross national boundaries without regard for artificial lines that humanity has drawn on a map (Waring, 1989). Bronfenbrenner's (1979) circles and the adapted 6-level version used in this analysis create a heuristic framework to understand the layers of an ecosystem regardless of its dimensions.

### *Environmental Psychology*

Roger Barker, one of the intellectual forebearers of environmental psychology, used extensive field research to create his theory of *behavior settings*. Barker (1963) states that, “[b]ehavior settings are bounded, self-regulated entities involving forces that form and maintain the component inhabitants and objects of settings in functioning patterns with stable attributes” (p. 31). Although theoretical and empirical work debates the long-term stability of settings, the theory of bidirectional influence and the methods used are enduring additions to ecological research. Barker (1965) demonstrates that there are environmental factors (in addition to inter-human factors) strongly and similarly impacting the behavior of different actors in the same setting or differentially impacting the same actor in diverse settings. Based on this idea, Barker (1965) posits that behavior settings are not merely a region that determines the behavior of people within it with varying effect, but an “entity” that regulates some behaviors of actors within it through a system of punishment and reinforcement. A particular setting will demand certain behaviors and interactions when different sized groups of actors are within the setting.

Thus, any setting variable should be tracked for better understanding of the totality of a setting's influence; even temperature should be seen as a variable that affects human behavior (Moos, 1976).

Barker's *behavior settings* are the building block of ecological psychology (Moos, 1976). Barker (1968) states that:

The essential nature of the units with which ecology deals is the same whether they are physical, social, biological, or behavioral units: (a) they occur without feedback from the investigator, they are self generated; (b) each unit has a time-space locus; (c) an unbroken boundary separates an internal pattern from a differing external pattern. By these criteria, an electron, a person, and a waterfall are ecological units. This is true also of most towns and cities... (p. 11).

Although these parameters were observed by Barker and colleagues, these attempts at contextual laws still ignore the effects of external disturbances that evidence the fluctuating and artificial nature of ecological boundaries. Still, these parameters grant researchers the ability to determine settings for ecologically valid research – as long as one accepts the limitations of its boundaries.

Rather than seeing an environment as a single entity, a single physical environment may be made up of sub-environments; personal characteristics can be conceived as the consequence of an environment or a constant set of variables within that environment (Wolf, 1974). Wolf (1974) also notes that these sub-environments overlap, creating the influential characteristics of a physical environment, acting on the individual. Wicker (1974) adds that measuring these overlapping environments may be at the expense of traditional rigor:

Research must reflect the interdependencies of the man-environment [sic] relationship. Studies must not treat persons or settings merely as objects to be measured, but rather as interacting components of a system. Complexities must be grappled with, even at the expense of certain niceties of research design. Quick and easy research studies must be replaced by careful, thoughtful attempts to

understand the dynamics of settings. Research problems must dictate research methods and the choice of measuring instruments, not the reverse. (p. 613)

One of the central ideas to Barker's (1978b) critique of mainstream psychological research is the concept of *behavior tesserae*; tesserae, commonly known as pieces of glass or marble used in mosaic work, are seen behaviorally as behavioral fragments selected by researchers to suit his or her goals and methods. In this way, the researcher disrupts the natural units of behavior and imposes an artificial mosaic – or tesserae – of behavioral pieces in its place (Barker, 1978b). In short, behavior units are discovered, behavior tesserae are designed. “Behavior tesserae have greater harmony with the theoretical and mathematical *zeitgeist* of present-day science than do behavior units. It has been a triumph of modern psychology to devise behavior tesserae that fit the conceptual and methodological canons of modern science.” (Barker 1978b, p. 14) These tesserae cannot capture the intricacies of streaming behavior, hence the need for behavior settings research.

A classic example of a behavior setting is illustrated in a classroom described by Barker (1968): “There is a synomorphic relation between the pattern of the behavior occurring within the class and the pattern of its nonbehavioral components, the behavior objects. The seats face the teacher's desk, and the children face the teacher, for example” (p. 17). In the classroom example, the interaction of physical and social pressures demands certain behaviors, regardless of differing occupants. Obviously, there are differences from one classroom to another, but there are surprisingly similar parameters for behavior across classrooms in geographically diverse locations.

Barker (1968) also theorized and measured the effects of *undermanned* (or understaffed) versus *optimally manned* (or optimally staffed) and *overmanned* (or

overstaffed) settings. According to Barker (1968), every setting has a particular optimal population for functioning. Less staffing results in people fulfilling multiple necessary roles and more people results in excess human resource. Barker (1963) asserts that understaffed settings promote greater sense of belonging, greater acceptance of diversity, and greater acceptance of responsibility – balanced with less competition. Behavioral modification is achieved by steering deviant individuals toward acceptable parameters. Overstaffing results in excess and unneeded actors that are less invested in common goals and more competitive; behavioral parameters are policed by “veto,” in which deviant actors are simply ejected from the setting (Barker, 1963). Katz and Kahn (1978) assert that surplus energy and resources (*organizational slack*) is necessary for the regeneration and growth of a system (as cited in Kelly, Ryan, Altman, and Stelzner, 2000). From a staffing perspective, this seems to undercut Barker's (1963) determination that overstaffing has numerous and exclusively negative effects when compared to understaffing. More recently, Perkins (1982) empirically supported the task effects of undermanned versus overmanned settings theorized by Barker but did not find the subjective experience effects hypothesized by Barker. Regardless of its limitations, Barkers behavior settings deserve further investigation and elaboration. In an age of online communities, perhaps contemporary behavior settings research could explain behavioral patterns in chat rooms, on blogs, and in the myriad other emerging means for humans to interact.

## *Community Psychology*

Shinn and Rapkin (2000) assert that, “[a] central tenet of community psychology is that human behavior must be understood in context” (p. 669). Brody (2000) also notes that in community psychology it is accepted that physical environment strongly influences social interaction. Centrality and acceptance aside, Levine, Perkins, and Perkins (2005) observe that, “...conceptualizing and measuring the environment of human behavior are relatively recent developments in psychology, and at present there is no single coherent and comprehensive theory” (p. 118). Although psychologists had been using the ecological model to aid in the understanding of mental illness for over thirty years before the Swampscott Conference in 1965 (Dunham, 1940), no one had systematically adapted actual principles of ecology into any form of psychology until Kelly (1968). At the forefront of the emerging field of community psychology, Kelly (1968) adapted several tenets of natural ecology for use within community settings. He found *interdependence*, *cycling of resources*, *adaptation* and *succession* to be useful lenses to view community issues through. Although the original focus of these principles was mostly limited to community mental health and the adaptation of the principles was also limited, Kelly (1968) set the stage for more widespread adoption of ecological conventions within community psychology. There is certainly an overt adoption the ecological analogy in CP, although Shinn (1990) reminds us that, “...community psychology needs to pay more than lip service to issues of level in developing theory, defining variables, and testing relationships” (Shinn, 1990, p. 126).

A 1970 National Institute of Mental Health (NIMH) report by Kelly, Goldsmith, Coelho and Randolph expressed the need for an interdisciplinary approach to ecological

theory, which they saw as central to understanding communities. This perspective includes explicit research assumptions based on the values of CP; Kingry-Westergaard & Kelly (1990) note that, “[w]ithout explicit assumptions, researchers run the risk of tacitly endorsing assumptions that they themselves may not consider to be valid, authentic, apt, or robust for conducting research in community psychology” (p. 23). By 1980, ecology had permeated much of community psychology; according to McClure, et al. (1980), the three defining characteristics of community psychology (based on previous models espoused in the field) are: “(a) a competency-prevention-oriented theoretical perspective, (b) a preference for organizational and community ecological levels of intervention, and (c) the need for an ecologically valid research base” (p. 1000). As 2 out of 3 characteristics are based on the ecological model, it is obvious that ecological validity is a deep concern to the field.

Much of the community psychology literature that utilizes ecological theory only focuses on human/social ecology, at most taking into account the abiotic elements that directly affect human behavior. To curb limited ecological thinking, Shinn and Toohy (2003) introduced the concept of *context minimalization error*, which is “...the tendency to ignore the impact of enduring neighborhood and community contexts on human behavior” (p. 427). Interestingly, they suggest that researchers are more prone to commit the context minimalization error than lay people. As a field that claims to pay special attention to context, community psychologists must increase efforts to avoid such error. Without a full systems view of phenomena, most community psychology models are best described as acting within the interactional science perspective – or at best, the organismic science perspective.

Levine, Perkins, and Perkins (2005) outline four levels of ecosystem that include a more complete picture of ecological theory for community psychology: a) *Population*, b) *community*, c) *ecosystem*, and d) *biosphere*. *Population* refers to a group of individuals with similar demographic markers, roles, etc. *Community* refers to the populations that share a defined area, normally geographically defined. *Ecosystem* refers to the community, the inanimate environment, and the interactions between them. *Biosphere* refers to the larger inhabited environment, or can refer to the entire earth. This model synthesizes most of the ecological models previously used in community psychology, while still including the natural environment. The ecological framework presented in Levine, Perkins, and Perkins (2005) is not a comprehensive view of ecologies, but it is a solid step in the right direction for community psychology.

Community psychology is far closer to the *human science* perspective outlined by Polkinghorne (1983) than many other fields. Bry, Hirsch, Newbrough, Reischl, & Swindle (1990) explain the human science perspective: All science is a social matter in which researchers not only choose method but their conceptual position—often by defaulting to the accepted assumptions of “normal science.” Tolan, Chertok, Keys, and Jason (1990) assert that community psychology has always avoided falling under the category of *normal science* (a la Kuhn, 1996), as its ideal values and motivations as a field are critical and transactional. As an ecologically minded human science that still values psychology, community psychology straddles two concepts that are sometimes in extreme tension with each other; Shinn and Rapkin (2000) note that, “[w]ere we to lose this ultimate connection to the individual, we would cease to be psychologists, but when we confine ourselves to the individual level, we lose our community identity” (p. 678).

Ecological proponents have emerged from a variety of disciplines to help shape a contextual and ecological understanding of behavioral phenomena (Kingry-Westergaard & Kelly, 1990). Ecologically valid methods may act as a catalyst for the synthesis between varied ecologically minded disciplines – including environmental science and the social sciences. Moos and Brownstein (1977) also noted over 3 decades ago that environmental science and utopianism have reached a stage in their development where they are primed for the mutual exchange of ideas. As CP continues to pursue ecologically valid perspectives and methods, community psychologists have the opportunity to be at the forefront of this synthesis.

*Community psychology versus mainstream psychology.* While Community psychologists were exploring the complexities of ecological interactions, mainstream psychology – mired in Behaviorism – was beginning to understand the effects of context on behavior. Bandura (1978) explicates the now famous theory of *reciprocal determinism*. Bandura's theory sees an individual as an actor in context, creating a dialogical relationship between subject and environment that determines behavior. Compared to the radical behaviorism that preceded Bandura (1978), reciprocal determinism was a relatively enlightened explanation for individual behavior. From an ecological perspective, reciprocal determinism is still exceedingly reductionistic, just at a higher level of analysis than radical behaviorism. Shinn (1990) partially blames psychology's preoccupation with individual level measurement on the, "...confusion between the consciously perceived environment and the functionally significant environment..." (p. 122), and that, "[t]he assertion that one can assess extraindividual units of conceptualization by questioning individuals requires scrutiny" (p. 114). Montero

(2002) clarifies this limitation by illuminating the context to the dialectic of reciprocal determinism: According to Montero (2002), all human action is an “open work” which is subject to interpretation by any other involved person, as well as anyone somehow connected to the interaction. Regardless of their awareness of the ever-expanding context, an actor within the subject-object dialectic affects and is affected by transcendent elements of their ecology (Montero, 2002). Thus, reciprocal determinism is an element of a larger dynamic topography, wherein any discrete subject-object interaction is an artificial abstraction and must be viewed as such.

There are other reasons aside from values and theoretical underpinnings acting as a barrier to ecologically valid research. Wicker (1990) asserts that statistical significance is necessary for publication, generating higher-level variables from aggregated individual-data is more likely to be conducted due to the system of rewards. Investigators that use more appropriate methods or different methods at different levels may produce more ecologically valid research at the expense of statistical significance (Wicker, 1990). Reppucci (1990) claims that finding publication outlets for ecologically oriented research is more difficult because it is not seen as rigorous by normal scientific standards. Brody (2000) notes that specifically environmentally oriented research by psychologists lacks a foothold outside of academia. The ecology of publication and academic success is often a major barrier to ecologically valid research.

*Environmental degradation and CP.* Humans have transformed the environment they live in, often with destructive results (Moos, 1976); both the natural and built environment should be thought of as part of the world that we must live in and adapt to in order to survive. Brody (2000) asserts that community psychologists can contribute to the

resolution of environmental issues by showing that pollution isn't just measured in dollars or incidence of disease but must include behavioral and emotional reactions and their effects on social relationships. Pollutants directly cause learning disabilities and mood disorders (Brody, 2000), while ecological crises are closely bound to social justice issues (Bookchin, 2003). Although rare, some community psychologists are deeply concerned about environmental issues; Culley and Hughey (2008) take issues of hazardous waste disposal and their interaction with power and participation head on. Climate change has also recently emerged as a theory and research focus for community psychologists (see the upcoming special issue edited by Manuel Riemer and Stephanie Reich in the *American Journal of Community Psychology*), but Brody (2000) maintains that the question isn't: "Why is environment emerging as an important focus for community psychology; but rather: Why is it *still* emerging more than 25 years after the first Earth Day?" (p. 942). Environmental action by community psychologists – even with its direct links to the ecological perspective – is more in its infancy than adherence to ecological methods and theories.

In community psychology's defense, environmental action and activism is contentious even within the field of ecology; May (1989) notes that discussion of ecological boundaries and disturbances among ecologists are often polarized – from those that believe that evolution has tried all avenues and there is little to worry about to those that believe the stars are disturbed by picking a flower. May (1989) establishes that laboratory experiments and field observations demonstrate how important spatial and temporal scale is to the relationship between observable behavior, phenomena, etc. and relevant ecological context; the persistence of populations may require more area and

resources than they inhabit and disturbances to seemingly unrelated regions and resources may have lasting impacts on people, non-human organisms, and places. The balance of evidence and opinion in ecology rests on the side of caution. Ecologies can and have been changed by human and nonhuman disturbance; human change can be a side effect of “anti-environmental” actions or well intentioned environmental policy – although both can be seen as changing ecologies in a non-natural way or at an artificial pace. Hopefully intentional change is preferable to merely accepting side effects of human action or attempting to detach from the environment completely. Brody (2000) urges the field that, “[t]he fates of local and global communities are our issues as community psychologist. As professionals, we must become involved” (p. 944).

## CHAPTER IV

### ECOLOGICAL PRINCIPLES ADAPTED TO COMMUNITY PSYCHOLOGY

Identifying major ecological principles can be a moving target; McIntosh (as cited in Cherrett, 1989) reminds us that, “It is clear that ecologists are not unprincipled, but it is very difficult to find consensus among ecologists on what a principle is, or on specific principles” (p. 14). In a survey of the British Ecological Society (Cherrett, 1989), the 8 most important concepts in ecology were: The ecosystem, succession, energy flow, conservation of resources, competition, niche, materials cycling, and the community. Although this highlights theoretical priorities, one respondent aptly noted that the multidimensional nature of ecology renders the project of ranking of concepts by importance “pointless” and “absurd.” Regardless, these rankings give us an idea of priority of theory in natural ecology. According to Kelly et al. (2000), an ecological approach also has a balanced view of social structures (elements of a setting that provide opportunities and/or reinforcement for interaction and behavior for system members) and social processes (actions within a system that interact with, are influenced by, and influence social structures). Structures are often the focus of environmental research, especially since processes are much harder to define and measure. Kelly (1968) did an admirable job of adapting many of these conceptual processes, but there are several useful concepts that can be added to the project of an ecological metaphor in community psychology.

The following is an attempt to create a more comprehensive adaptation of ecological concepts for community study. Including Kelly's (1968) 4 concepts (some modified for better theoretical fit) and additional useful concepts integrated from natural ecology by myself (and clarified by J.R. Newbrough) – especially the list generated by Cherrett (1989), following are the 7 most relevant ecological concepts for community psychology: Interdependence, adaptation, succession, cycling, entropy, centripetal versus centrifugal focus, and diversity versus homogeneity. Concepts newer to community psychology are explained in further detail than those explicated by Kelly (1968).

### *Interdependence*

*Interdependence* is one of the 4 elements introduced to community psychology by Kelly (1968). This concept represents the ecological connections between levels, people, organizations, etc., making up the basis of holistic and ecological thinking. Kelly, et al. (2000) note that, “The essence of the ecological perspective is to construct and understanding of the interrelationships of social structures and social processes of the groups, organizations, and communities in which we live and work. The concept of interdependence is the basic axiom of the ecological perspective” (p. 133). From a community perspective, interdependence also includes power relationships between elements of the ecology, e.g., stakeholders, researchers, organizations, workers, politicians, etc. Interdependence embodies the reliance of ecological elements on each other, as well as their co-influence.

### *Adaptation*

Another concept from Kelly (1968), *adaptation* means that elements or actors within an ecology learn and adapt to their dynamic context. In CP, this can refer to learning organizations, seeking training and education, community organizing efforts, etc. Adaptation can be represented by individuals or organizations understanding the adaptation happening in a context or action to initiate or encourage adaptation in people, organizations, neighborhoods, communities, etc.

Adaptation also relates to the ecological concept of *niche*; niche traditionally refers to a place in a community for a population or sub-population of organisms. Organisms can adapt to fit existing niches or modify contexts to create a niche. In contemporary ecology, niche instead refers to “a multidimensional utilization distribution” (Schoener, 1989, p. 79) which is essentially a population's use of resources and habitat – changing the definition from a recess to the occupant of the recess (or its stable patterns of consumption and behavior). According to Schoener (1989), a niche is defined by food, space, and time. Using the utilization distribution definition of niche, this can be represented as a histogram of resource use by a given population. By tracking resource use patterns of a population, sub-population, or individual, one can determine its level of adaptation and the magnitude of the niche.

### *Succession*

*Succession* represents the natural changeover in contextual elements in an ecology. In nature, this can refer to a young forest yielding to a hardwood forest over time (Miller, 2000). In a community, this may refer to a neighborhood converting from

industrial factory buildings to lofts and restaurants – or any changeover of built elements that affects or changes inhabitants (Forrester, 1975).

It is important to note that although ecologies often evolve over time, sometimes this process is sped up, slowed, or changed entirely by forces external to the local system. Hettinger and Throop (2008) note that broad changes like climate or smaller scale changes like fire, species invasion, draughts, changes in soil composition, etc. continually change ecosystems without immediately discernible stable patterns. As previously described, the disturbance of seemingly balanced and isolated systems is a part of the process of succession; focusing on local equilibrium is problematic and unrealistic (Hettinger & Throop, 2008). Still, much like Lewin's (1997) *force field analysis*, understanding ongoing processes of succession grant researchers the knowledge of social momentum and what amount of intervention it might take to negatively or positively catalyze current system trends.

### *Cycling*

Modeled after the first law of energy and the law of conservation of matter (Energy and matter can neither be created nor destroyed), *cycling* follows the flow of energy, currency, resources, populations, time, etc. as it moves within and between settings. Similar to Kelly's (1968) *cycling of resources*, cycling is intended to highlight the historicity of people, settings, and resources, while aiding in the tracking and/or planning of their trajectory.

The *first law of energy* states that energy can neither be created nor destroyed (Miller, 2000). In natural ecology, this law is applied to any natural cycle – including

human energy creation and consumption cycles – and must be taken into account when analyzing any natural phenomenon. The source, use, and destination of energy involved are telling of many useful data. Efficiency, opportunities for conservation, and potential hazards or blind spots are some of the useful pieces of information that are yielded from applying the first law of energy.

The application of *cycling* to community psychology is a good fit and beneficial. In many cases within the field of psychology – even in community psychology – events are viewed as discrete phenomenon. Energy and resources utilized for a project, program, etc. are seen as either available or not; projects, communities, people, and organizations obtain or divert energy and resources, then use them until they are gone. Although this notion of energy and matter dynamics is basically functional, it oversimplifies and overlooks many important factors. The application of cycling relates to the flow of energy and resources; since nothing can be created nor destroyed, all resources can be traced on a continuum from the source direction and to the exhaust direction. This exercise informs us of the origins of funding, volunteer workers, participant enthusiasm, etc. It also traces the distal origins of resources for community work that may conflict with the values and goals of participants, organizers, and researchers. Rosen (1993) asserts that action research has been significantly shaped by funding sources, more so than by any value-based or disciplinary logic. Many social science research projects are funded by government sources, some of which are ideologically bound to stances on issues that are under litigation or legislation, calling into question the intended purpose of the research results (Fincher, 1985). Brieger (2005) illuminates the ethical dilemmas faced by social science researchers: Can the results of the analysis be used to identify

vulnerable populations? Will the military utilize our best research tools to achieve goals incongruent with our values? Do our funding sources dictate the purpose of our research? These questions can be understood through the application of the cycling concept.

Cycling can be applied conceptually in numerous situations. Marger (2005) outlines the complexities of social mobility, showing that an actor does not spontaneously create the resources necessary for upward mobility, but diverts them from other sources and cycles, and then exhausts them into yet another set of cycles. By this logic, an individual that exerts upward mobility likely causes the downward mobility of others. Miller (2000) also paraphrases the first law of energy as “there is no away”(p. 24), meaning that all resources, energy, etc. must go somewhere when discarded. Bags of trash do not simply go away when thrown in a trash can; they fill up landfills, leech into water tables, blow away, and so on. Forrester (1969) posited urban dynamic theories wherein neighborhood revitalization was recommended as a means of increasing wellbeing of the community; the theories never included where the people who lived in these neighborhoods would go, nor how they would get there. For the people currently living in so-called “undesirable” neighborhoods, there is no away.

### *Entropy*

Modeled after the second law of energy, which states that the transfer of energy reduces the quality of energy, the *entropy* represents the degrading of energy and resources as they transfer between and through individuals, organizations, and systems. This can be seen as the decay of funding as it passes through organizations, the diffusion of responsibility and motivation through meetings, etc.

The second law of energy states that when energy changes forms, some of the useful energy decays into a less useful, diffused form (Miller, 2000). Another way to state the second law of energy is that high quality energy naturally degrades into low quality energy. Whether in nature or in an organization, this means that you can't break even (Miller, 2000); every process or use of resources toward a goal loses some of its value without any gain in trade. J.R. Newbrough succinctly coined the term *entropy tax* to describe this phenomenon (personal communication, April 13, 2006). Supporting the concept of entropy, in an ecosystem, Waring (1989) states that recovery takes place most rapidly where energy travels efficiently and rapidly through systems. This easily translates into human systems where overly bureaucratic and laborious systems are slow to recover from disturbance – just as they are slow to dynamically adapt to any change.

The New SPECs organizational change project was witness to an excellent example of the second law of energy; by tracing the path of money donated to help the wellbeing of communities, the decay of energy is apparent. When money is donated to a regional funding agency, a portion is diffused into the organization for administrative costs. The value of the energy – now filtered into the organization – has degraded into a less usable form. The funds are now allocated to another organization, wherein the same process of partial decay occurs. The organization then implements services that less-than-efficiently increase the wellbeing of community members. The original energy granted to the system in the form of funding degrades into many pockets of diffused energy that cannot be traded back for the higher quality energy that it once was. An obvious contrast to this diffusion would be directly funding those in need, thus alleviating the entropy tax, but numerous other barriers stand in front of this one efficiency.

Jong-sung (2005) compared the corruption in 129 countries, noting its effects on the disadvantaged members of society. Corruption can be viewed as an entropy tax similarly to more legitimate funding inefficiencies. Reduction in the diffusion of resources increases legitimacy and strategic decision-making ability of governments and organizations (Rodriguez, Uhlenbruck, & Eden, 2005). Understanding and reducing the decay of energy within a system improves efficiency, legitimacy, and available resources. This process and goal are congruent with community psychology's methods and values.

Kelly et al. (2000) cites Katz and Kahn's (1978) concept of *negative entropy* as an efficient utilization of resources to resist the natural entropy within an organization; the focus on efficiency is important to slow entropy, but an expanded ecological perspective would reveal that using resources to prevent entropy are likely speeding entropy either in another system or at another level within the same system. In natural systems, it is commonly seen that the creation of order or higher-level energy is accompanied by entropy of greater magnitude at higher levels of ecology. Thus, the idea of negative entropy denies the tenet of cycling of resources.

### *Centripetal Versus Centrifugal Focus*

Based on the ecological tenet of *conservation of resources* and related to concepts of *decentralization* and *efficiency*, *centripetal versus centrifugal focus* represents an inward focus (efficiency, conservation, and focus on current strengths) instead of an outward focus (externalized, standardized, technical strategies). This focus on conservation and use of existing and internal resources versus a focus on unlimited growth and external solutions and resources is based on knowledge of resources,

processes, and strengths of a system, rather than large-scale nomothetic approaches to social issues. Centripetal strategies include decentralization of processes, focusing on existing strengths, and retooling of existing resources. Non-ecologically valid centrifugal strategies include using exterior technical strategies, centralized power and solutions, unlimited growth, externalizing costs of issues, and disempowering, deficit addressing programs.

Modern science – with social science being no exception – mostly relies on external, centralized technical strategies for “solving” problems (Miller, 2000). In many cases, the overuse of such technology has aided in the development of social problems in the first place – as well as inept, behemoth bureaucratic mechanisms intended to manage these problems. Centrifugal, external strategies can also be seen in the “program” approach to issues, wherein generally standardized sets of educational or skill-building gauntlets are created for community members and workers to run through. After this “intervention,” self-reliance and gratitude are expected.

Most visible in energy production (e.g., nuclear power plants), costs of some aspects of processes are often externalized (Miller, 2000). In the energy market, nuclear power is cheap and plentiful. Of course, this cost does not include many prices for which people have and will pay dearly. The decay life of plutonium is longer than the history of humanity, while nuclear reactors must be decommissioned after about 40 years – entombed or disassembled for long-term storage. Uranium tailings are still piled high in the southwestern United States (Kuletz, 1998). None of these costs – like health, security, storage, etc. – are included in the market cost.

Many decisions made in communities are made without much thought to the externalized costs. When tax incentives are given to factories so that they will move their operations to a community, what will be lost from the revenues? What will pay for the pollution that is created? When whole neighborhoods are cleared out to make room for a new development, where will the people go? Can they even afford to shop in the stores that have supplanted their homes? Costs measured in diminished well-being are almost always externalized. It is the responsibility of the community psychologist to *re-internalize* those costs.

Seeking centripetal solutions requires a different approach; instead of *adding* something to a problem situation or community to solve problems, the ecologically minded researcher utilizes existing skills, resources, and relationships while simultaneously reducing the need for more resources than are at hand. This tenet is partially echoed in Nelson and Prilleltensky's (2005) *strengths-based approach* to communities, clients, and participants, in which researchers and practitioners focus on available strengths instead of deficiencies to be filled externally. Increasing efficiency, focusing on the strengths of communities and their members, and reducing reliance on outside entities increases resilience and empowers those who would otherwise merely be the beneficiaries of temporary interventions. This is related to Lewin's (1997) *force field analysis*, in which barriers may be removed instead of adding force to achieve a goal.

The tenet of centripetal versus centrifugal focus can be directly related to Barker's (1963) observations on staffing; understaffed versus overstaffed settings are congruent with the prevailing direction of forces within a setting. Understaffed settings focus inward to better utilize existing strengths for fulfilling necessary functions – essentially

centripetal. Such a focus is unifying and efficient. Overstaffed settings display an outward force, vetoing out actors, resources, and behaviors that do not fit narrower criteria – essentially centrifugal. In contrast, this focus fractures settings through inefficient divisiveness.

### *Diversity Versus Homogeneity*

This tenet represents acknowledging, celebrating, and cultivating diversity over conformity and monocultures. Diversity is at the root of adaptation and survival in the natural world (Miller, 2000). Without diversity, crops are wiped out, species become wholly diseased, and global temperature-shifts destroy entire ecosystems. Barker (1963) emphasizes the importance of this tenet for understanding systems and urges researchers to observe diversity's connections to unity and stability within a behavior setting. Walker (1989) asserts that diverse ecosystems provide multiple paths for energy flow which allows for function and relative stability even when there is destructive disruption to the system; complex biotic webs are a more stable network than simpler systems (i.e. monocultures).

From the perspective of natural ecology, diversity does not always mean harmony or balance between inhabitants of a system; Hettinger and Throop (2008) note that many ecologists do not believe in integrated, stable communities of varying species; many species are opportunistic and are only held in stability by predators, food supply, climatic or geographic features, etc. This competition is often a necessary element for non-human systems, but human communities can (but unfortunately often don't) forego some competition for cooperation; although some ecologists note similarities between non-

human and human communities, the comparison ignores the “shared purpose and meaning” (Hettinger and Throop, 2008, p. 189) that often hold human communities together (and presumably cannot be found in nonhuman communities).

Barker (1963) outlines extensive research that demonstrates how understaffing and overstaffing behavior settings have a distinct effect upon diversity: Understaffing preserves diversity, as all actors are important for functioning; overstaffing allows actors in control to “veto” out fringe actors, thus reducing diversity. Kelly, et al. (2000) argues that diversity of ideas can come from the “slack” that emerges when excess resources (e.g., time and staff) are available. Regardless, the balance of diversity versus homogeneity is linked to behavior settings and organizational theory. Barker (1963) reinforces the need for diversity, stating that, “...in any self-regulated system variety within the system is necessary if varied disturbances outside the system are to be countered” (p. 38). The survival of a system rests solidly on its ability to maintain diversity.

Ecological diversity need not only mean diversity of individual actors in a system. Diversity of systems, cultures, or viewpoints are also important. Adherence to this tenet can also be demonstrated by diversity of research methods, tailored approaches for systems change, etc. Campbell (1969) emphasizes the need for research diversity for effective inquiry; adhering to this tenet moves research closer to Campbell's (1969) vision of interdisciplinary, multi-method research.

## CHAPTER V

### MARKERS OF ECOLOGICAL VALIDITY IN COMMUNITY RESEARCH

In order to measure ecological validity, it is first necessary to identify the markers of ecologically sound research, and then establish a generalizable instrument for measuring the markers. Law and Watkinson (1989) note that community ecology (a sub-discipline of natural ecology) has a difficult time establishing an empirical foundation for itself – especially because interactions and their strengths are the basis for community ecology and are tremendously difficult to measure relative to population characteristics. This difficulty is echoed in community psychology; as we attempt to establish transactional science empirically, we are constantly attempting to use old tools for a new job. Measuring the interactions and relationships in a community requires a unique – and likely contextually bound – combination of existing, emerging, and heretofore undiscovered tools and perspectives.

#### *Theoretical Underpinnings*

As outlined in the previous literature review, ecological theory is a rich and useful perspective for designing, understanding, and implementing research. It is important that community researchers have a solid understanding of ecological theory. This understanding can be observed through the literature consulted for the conceptualization of the research, the logic of the research design, and the perceived implications of the research by the researcher(s). Trickett (1990) adds that, “...truly adventuresome

ecological research would integrate the research relationship with the scope, quality, and impact of the data, it would assess interventions across settings and levels of analysis; and it would develop constructs that derive their power from a collaborative research process” (p. 213). Such “adventurousome” ecological research adds to its validity – especially the potentially positive impact on communities.

Ecological theory that has influenced and been widely cited in the literature of community psychology is included in the assessment, as well as an understanding and integration of the levels, processes, and concerns put forth by these theories. Fortunately, conceptualizing and distilling the temporal, spatial, and theoretical dimensions of ecological research has been started in community psychology; Christens and Perkins (2008) created a framework for conceptualizing work at different levels of ecology through a temporal process of liberation that highlights the complexity of ecological analysis and the myriad levels, sectors, and periods within a process where researchers and practitioners can theorize, act, and measure. First, it is important to outline methods for community research that have the ability to capture ecological levels and processes – thus achieving a higher level of ecological validity.

### *Current Methods and Methodology in Community Psychology*

Community psychology and its focus on ecological – or at least contextual – perspectives is not known for innovation in its analysis, with most of its empirical work utilizing an embarrassingly narrow range of analytic approaches (Luke, 2005). Tolan, Chertok, Keys, and Jason (1990) note that community psychology is a field that tends to constructively struggle with balancing rigorous methodology and our values that promote

social action. Shinn (1990) attributes community researchers lack of success in understanding and changing higher ecological levels to a lack of understanding of variables at multiple levels and selection issues with measurement and statistical analyses beyond the individual. Rapkin and Mulvey (1990) remind us that community issues are complex and that the methods we use must reflect this complexity. McClure, et al. (1980) sampled research articles from the *American Journal of Community Psychology*, the *Journal of Community Psychology*, the *Journal of Community and Applied Social Psychology*, and the *Community Mental Health Journal*, determining that community psychologists and community mental health professionals often theorize and conceptualize research phenomenon from the community perspective but rarely intervene at the community level and almost never conduct high quality community-level research – almost always working at the individual and small-group level. This mismatch alludes to a lack of training in methods to capture community level phenomena, a culture of acceptance of individual-level methods, and a rewards structure for more traditional methods and instruments.

In 1957, Trow (as cited in Bryman, 1984) suggested that methods of investigation should be dictated by the problem of focus, rather than the other way around. Trow also contraindicated the espousal of one or few methods to suit all problems for inquiry (Bryman, 1984). Although the intricacies of this suggestion may be challenged, community inquiry and ecological perspectives often rest on methods almost antithetical to ecological systems thinking. By aggregating data to a single level – which most statistical analyses do – multiple levels of an ecosystem are artificially compressed, resulting in a tremendous loss of information. Not only is this antithetical to systems

thinking, but technically impractical as well. Luke (2005) perceptively describes this contradiction, stating that "...although community scientists value contextual *thinking*, we are much less likely to actually employ contextual *methods*" (p. 188). These contradictions do not occur because community psychologists do not actively pursue methodology congruent with their theories, ethics, and values. Differing from mainstream psychology, community psychology must observe the relationship between inquiry and community while developing a multiple method framework for inquiry that reflects its theoretical backdrop (Dokecki, 1992).

Waring (1989) notes that studies of natural ecosystems have moved from descriptive to predictive, making accurate theory, measurement, and action more important than ever. To keep pace with advances in ecological theory and human science methods, we must move beyond traditional methods. According to Barker (1978b), the discrete segments artificially present in interviews, experiments, tests, etc. in labs did not prepare the researchers with methods for "...recording the unbroken behavior stream, no concepts and techniques for identifying its parts and pieces, and no system for analyzing its attributes" (p. 3). Since community psychology observes the ecological context of community settings, a fruitful methodology that observes this relationship would stem from and support an ecological perspective.

While traditional methods force data into static and stable notions of behavior, it is the dynamic and varied nature of behavior that makes us human; Barker (1974) notes that "[o]ne of the obvious characteristics of human behavior is its variation" (p. 255). Changes in statistical knowledge, computer hardware capabilities, and software options have led to innovative analytic strategies that are congruent with ecological assumptions

(Luke, 2005) – allowing better measurement of variation in human behavior. These innovations require technology and skills that are not readily available – nor sometimes appealing – to many researchers in the social sciences. Extensive qualitative methods also require aptitude, skills, and time that are hard to find, while participatory action research requires skills, time, and an abundant commitment to values of social change that are rare and sometimes unattainable in research settings. Sells (1974) also reminds us that the biggest barrier to ecological research is effectively encoding environments – as moving beyond measuring discrete behaviors and subjective experience is problematic. Regardless of the extensive prerequisites for ecological methodologies, for some researchers there is no other alternative congruent with their values and goals for research.

## CHAPTER VI

### ECOLOGICAL METHODS

The methods this paper covers are multi-level statistical modeling, network analysis, deep qualitative research (e.g., ethnography), behavior settings research, participatory action research (PAR), geographic information systems (GIS), and dynamic modeling. Of course, there are many more methods available to researchers, as well as untold derivations and applications of each method outlined. Methods such as cluster analysis, naturalistic observation, participant observation, time-series analysis, etc. have the potential to achieve or bolster ecological validity; the methods chosen have significant overlap with many other excluded methods and grant a broad stroke of ecological methods. These methods are also often used in combination with each other in mixed-method designs, thus increasing their potential for triangulation and ecological validity. The following methods either intrinsically or potentially qualify as ecologically valid. The use of these methods are measured in the evaluative framework – spanning within-level analysis to cross-level analysis and finally in trans-level analysis. Using the concept of ecological validity essentially demands striving for at least cross-level research. An ecological approach intrinsically focuses on transactions between systems as well as between people and systems simultaneously (Kelly, et al., 2000). Shinn and Rapkin (2000) note that, “...cross-level tools can...help us to understand the diversity of people's experiences...” (p. 692) but warn that, “... theory and methods develop in

tandem...” (p. 692), as mismatches in theory, research questions, measurement, and generalizing can void many of the advantages brought by higher ecological validity.

### *Statistical Multi-level Modeling (MLM)*

Multi-level modeling – most commonly *Hierarchical Linear Modeling (HLM)* – provides researchers with a theoretical and methodological match to cross-level phenomena (Shinn & Rapkin, 2000; also see Bryk & Raudenbusch, 1992, and Perkins & Taylor, 1996, for more detail). Allen (2005) effectively explains the importance of the advantages of MLM to ecological researchers: While more traditional statistical analyses treat all cases as equal, MLM retains the “nested” nature of community, school, and organizational data. By assuming nomothesis across cases and aggregating individual cases across levels, important information about groups and communities is lost. MLM not only fits ecological thinking, but supports ecological theory when other methods are used for triangulation. Perkins and Taylor (1996) use HLM to link data from content analysis, neighborhood inventories of systematic observations, and subjective surveys – providing support and detail to existing fear of crime and observed disorder theories. Khoury-Kassabri, Benbenishty, Astor, and Zeira (2004) use HLM to create an ecological model of school violence, since so many interacting factors influence any individual student. By triangulating the HLM results with historical and qualitative data, it is evident that context plays an important and complex role in human behavior. Dunifon (2005) uses HLM to determine the effects of a work program for welfare recipients, highlighting the group differences between program sites and population. This study sheds light on some of the ecological elements contributing to work success, while showing the long-

term ineffectiveness of the program for increasing the income of welfare recipients. Parboteeah, Bronson, and Cullen (2005) use HLM to compare ethical attitudes and people's willingness to justify ethically suspect behaviors. HLM allowed Parboteeah, et. al. (2005) to see similarities and differences within countries and between countries, effectively capturing the context of individuals and populations – showing the influences of political power, democratization, local attitude, national attitude, and proximity of nations on justification of ethically suspect behaviors.

Hierarchical Linear Modeling is a relatively common statistical tool that captures much of the complexity of ecological theory. Shinn and Rapkin (2000) urge researchers to use caution when employing HLM (or presumably other multi-level statistical models); “HLM requires careful attention to potential influences within and across levels. Theoretical considerations must guide applications of HLM” (p. 673). Used in tandem with solid theory, multi-level statistical modeling is an important part of ecological research.

### *Structural Equation Modeling (SEM)*

SEM is a complex and ever-evolving method to create and test models of latent concepts. SEM has steadily increased in popularity since 1980, spawning its own journal and becoming the most utilized statistical tool in methodology journals whose primary readership is psychologists (Tomarken & Waller, 2005). SEM is popular with psychologists because many concepts within the field are intangible and immeasurable, but are made up of measurable sub-factors. Due to recent innovations in multi-level SEM, ecological validity would be greatly increased with the inclusion of SEM's ability to

create and test complex models of contextual connections, as well as constructs relevant to ecological researchers.

Lee (1992) constructed a model of Quality Of Life (QOL) based on an ecological conceptualization. SEM allowed Lee (1992) to test whether measurable elements of subjects' ecology contributed to his model of quality of life. This study blended subjective and objective measures at multiple levels, simultaneously showing the efficacy of the QOL model and ecological theory. Waldo (1999) used SEM to conceptualize heterosexism in the workplace. The ecological connections between jokes in the workplace, supervisors' attitudes, number of non-heterosexual employees, etc. were modeled and included in the concept of workplace heterosexism. Experiencing heterosexism was associated with adverse psychological, health, and job-related outcomes, strengthening the ecological model that had been created. Ng Mak (2001) used SEM to trace potential effects of community and family violence on youth. Community and family violence were measured to see if either contributed to violent, aggressive behavior and depressive symptoms among youth. This study intended to support a model of aggression and desensitization to violence as a form of affect regulation for youth in violent contexts. The study was partially supported, finding that community violence contributed to youth's desensitization to violence and subsequent increased aggressiveness.

Structural Equation Modeling has an ever-increasing potential to support and develop ecological theory. Although SEM cannot stand alone as a methodology to legitimize ecological theory – especially since it is most often used to focus on psychological constructs at the individual level – it provides a strong analytical technique

for the ecological researcher. SEM is likely second only to Dynamic Modeling in its complexity, prerequisite technology and skill, and intimidation to social science researchers. Time will tell if its contribution to theory testing will outweigh SEM's drawbacks.

### *Social Network Analysis (SNA)*

Hughey and Speer (2002) note the importance of considering the intricacies of networks in order to understand a community; the strength and centrality of social networks can be both positive and negative, so measuring nuances with network analysis can be a necessary tool for creating interventions. Personal networks are flexible, dialectically interacting with context and opportunity (Fleisher, 2006) – making understanding and measurement of networks an important part of ecological theory and research. Papachristos (2006) notes that SNA is both a theoretical orientation and a set of methodological techniques: As a theory, SNA stresses the interdependence between social actors and organizations. As a method, SNA techniques attempt to measure these interconnections as a novel strategy for moving beyond actor-based data.

Network analysis not only sheds light on important relationships, but significant gaps in relationships as well. For a community that is trying to increase collaboration between organizations, seeing network gaps can inform action (Provan, Veazie, Teufel-Shone, & Huddleston, 2004). The structural and relational information gained from network analysis provides a distinctive means to study and or test theories (Wasserman & Faust, 1994). Network theory has many common principles with ecological theory, while network analysis provides many tools to test ecological connections. Network analysis

allows researchers to test the size of relevant ecological network connections, the strength and importance of each connection, and a limited picture of network structure (Luke, 2005). The measurement of intergroup connectedness adds to our understanding of the pool of potential ties and network opportunities, geographic mobility, and the expansion of networks (Fleisher, 2006). The match in assumptions and methods makes network analysis an indispensable companion for the ecologically minded.

Network analysis tools are based on the analysis of relational data, made up of information about connections and relationships between participants, instead of being made up of information about the participants themselves (Wasserman & Faust, 1994; Luke, 2005). Wasserman and Faust (1994) outline four important concepts in the social networks perspective:

- a) Actors and their actions are viewed as interdependent rather than independent, autonomous units;
- b) Relational ties (linkages) between actors are channels for transfer or “flow” of resources (either material or nonmaterial);
- c) Network models focusing on individuals view the network structural environment as providing opportunities for or constraints on individual action; and
- d) Network models conceptualize structure (social, economic, political, and so forth) as lasting patterns of relations among actors (p. 4).

Network analysis is the only way to provide and analyze this kind of structural information (Luke, 2005). This provides a useful and unique tool for triangulating phenomena within an ecosystem.

Time consuming and unconventional data collection methods, relatively underdeveloped software applications, and difficulty with missing data are the major drawbacks to social network analysis. The subjectivity of self-report measures used for most SNA can also be problematic; Provan et. al. (2004) rated trust between actors in their network by asking them directly how much they trust each other on a scale from 1

to 4. Although scores were combined, the relatively small  $n$  and un-piloted, loaded trust question make the quality-of-relationship measurement rather subjective.

Network analysis has been used to model disease transmission, job seeking behaviors, the spread of ideas, behavior within organizations, community development, teen smoking patterns, and more (Luke, 2005). Innovations in social network analysis make this already useful tool indispensable for ecological researchers. Dynamic versions of social network analysis, able to track changes and measure persistence of relationships within networks, are now available and in development (Breiger, Carley, & Pattison, 2003). As the technology and skills of dynamic social network analysis practitioners increase, its applications in ecology will be welcome and unique additions to transactional methodology. Within the foreseeable future, the drawbacks will likely be a small price to pay for the unique, rich knowledge that can be gained from SNA.

### *Deep Qualitative Methods*

Qualitative research is often an easier fit for ecologically minded researchers. Reppucci (1990) states that, “[m]ost studies that call themselves ecological are qualitative and descriptive in nature because designing an ecologically valid experiment is extremely difficult for both methodological and ethical reasons” (p. 160). Bryman (1984) states that many qualitative methods – e.g., ethnography and participant observation – aim to see phenomena from the perspective of research participants through direct involvement with them. This proximity grants the researcher contextual understanding that can only be understood from within the reality of an individual, group, or society’s ecology (Bryman, 1984). Deep qualitative research methods allow researchers to be sensitive to the context

of phenomena. This means exploring the unique cultural heritage of research participants, while establishing a trust-based dialogue that allows the concerns and world-views of all persons involved to be heard and considered (Prilleltensky & Nelson, 2002). Qualitative research methods are well suited to support and triangulate ecological theory, although extensive enough to easily dwarf the scope of this paper.

Arensberg (1937/1968) uses ethnography to understand the economy, culture, and latent beliefs of Irish peasants in the beginning of the 20<sup>th</sup> century. This ethnography reveals the ecological connections across and between individual, micro, meso, exo, and macro levels across time, creating an extremely ecologically valid picture of the communities and their inhabitants. Through immersion, observation, and constant informal interviewing, Arensberg (1937/1968) reveals details not even available to the participants themselves. The main weakness of this approach from a community perspective is its lack of intervention or action to improve the lives of participants.

Biehl (1998) uses historical case studies spanning the entirety of recorded human civilization – both culturally, spatially, and temporally. Within these case studies, she explores ecological connections between individual, relational, collective, and natural aspects of historical settings. Biehl (1998) makes an excellent case for value-based ecological theory, suitable for triangulation with quantitative methodology. Bang (2005) has directly observed ecological connections in sustainable villages worldwide, creating detailed case studies with subjective and inter-subjective elements spanning over thirty years. Bang (2005) not only chronicled the ecological topography of these villages, but also permanently immersed himself into the life of an ecovillage. Through this long-term exposure and hands-on experience, Bang widened his understanding and description of

the settings in focus. Bernard and Young (1997) mixed case studies of sustainable communities with GIS data to triangulate their descriptions of ecological connections within sites across the United States. Rutter, Mangham, Mortimore, and Ouston (1979, cited in Bryman, 1984) conducted an in depth case study of students in schools observing the complexities of the students ecology. This study showed that individual schools made an enormous impact on objective markers like national exams or delinquency arrests, essentially overturning the mega-funded, purely quantitative Coleman report from eleven years previous. This illustrates a pragmatic difference as well as the more debated epistemological difference: The qualitative report has greater validity from recognizing more relevant elements and interactions of the students' issues than the relatively shallow quantitative study.

Deep qualitative methodology can be based on values and practices that mesh well with ecological theory. Taking the time to immerse oneself in the ecological topography of an individual, group, setting, or event can make details and connections emerge that would otherwise remain obscured. The skills and time necessary to conduct worthy deep qualitative research are major drawbacks, as well as its rare use of action components to follow up results. Qualitative research also retains a relative lack of acceptance in academia – mostly due to its lack of focus on reliability and perceived lack of rigor when compared to quantitative methods. Future triangulation of qualitative methodology with quantitative measures will hopefully grant a wider acceptance, increased reliability, and increased perception of rigor for qualitative research. Even with these drawbacks, deep qualitative methodology is central to ecological research.

### *Behavior Settings Research*

According to Ragle, Barker, and Johnson (1978), when measuring a behavior setting, one must first determine how to identify, measure and describe the context of behaviors. As noted previously, artificial boundaries are useful for determining a space and time for measurement of settings and their influential variables. Wicker (1990) distills Barker's theory of relationships between behavior settings or nested systems as the point when "...different explanatory principles are needed" (p. 129). This explanation removes the assumption of discrete settings while retaining the point of difference between systems. Once a setting's boundaries are determined, the researcher may begin measurement. Barker (1978a) further asserts that there are two problems involved in collecting ecological data: One is the data gathering method; the other relates to policies and programs followed in establishing and operating a non-experimental, eco-behavioral facility. Barker's Midwest Field Station is an excellent example, although determining locations and funding for a long term field station would certainly be a challenge for community researchers.

Barker (1978b) claims that recording behavioral data is best achieved through verbal narrative records by trained observers and by video/audio recording. This type of observation is referred to by Barker (1965) as *transducer (T)* observation. Barker (1965) claims that when researchers act as a transducer of data – rather than an *operator (O)* – they do not create the world they are measuring, but rather translate it. As an operator (as in laboratory research), the researcher acts within the measured phenomena – potentially influencing and constraining it – while also acting as translator of the data. Barker (1965) asserts that this method of data collection grants greater control over the research as the

operator partially contrives the process being measured. This contradicts known observer effects (many of which have been articulated after Barker [1965]) that evidence the effect of all measurement on phenomena being measured. Regardless, T data (i.e., field observation) is far more “natural” and ecologically valid than O data (i.e., laboratory work) in Barker's (1965) estimation. Participatory action oriented research would seemingly fit into O data by its involvement with research phenomena, even though its dynamic nature fits best within the T model. Perhaps PAR research is a synthesis of the T and O models in which the researcher(s) act within a naturalistic setting to change behaviors and outcomes while utilizing T methods to measure outcomes. T data also conforms less to the plans of the researcher and therefore is less likely than O data to lead to laws of behavior or replicable patterns (Barker, 1965).

The study of behavior settings might lend itself to attempting the engineering of “ideal” settings for humans. Reducing the study of human environment and subsequent behavior to a continuum of favorable and unfavorable conditions must be avoided, as environments have the ability to foster certain characteristics and behaviors at the expense of others (Moos, 1973). This consequence should lead community researchers and practitioners to carefully weigh the outcomes of particular milieus on its regular and predicted inhabitants before analyzing environmental factors or engaging in change efforts. These potential consequences can also be avoided by participatory and collaborative efforts that dynamically respond to behavioral and community changes caused by changing environments – whether due to action research, succession, external change, etc. Keeping dynamic *maximal demands* (Biehl, 1998) as a long term vision of ideal elements of a setting while maintaining realistic *minimal demands* (Biehl, 1998)

steeped in the reality of participants and the capabilities of settings can yield greater well-being for communities and their inhabitants without the negative consequences of abstract social engineering.

### *Participatory Action Research (PAR)*

Ecological theory is not only based on the holistic view of object in context, but takes energy and power into consideration. Kelly, et al. (2000) note that the ecological perspective encourages interventions that promote the creation and facilitation of social structures and processes that allow better and more positive interconnectedness – essentially an action orientation. Kingry-Westergaard & Kelly (1990) note that, “[a]ccording to [the] ecological approach, theoretical propositions are tested, measured, and understood by the meaning that the propositions have for the participants who are experiencing the phenomenon” (p. 29). This declaration logically leads toward an intrinsically participatory nature for ecological methods. This standard is well matched to the critical thrust of participatory research, whose core analyses scrutinize the presence and movement of power (Cornwall & Jewkes, 1995). The participatory action researcher must not only track the changes within the setting’s ecology, but the shifting position of the researcher within that ecology and the constantly changing power dynamics between all participants (Hesse-Biber, Leavey, & Yaiser, 2004). This makes the action researcher a necessary expert on ecological principles to be an effective worker within the dynamic relationships of a participatory setting. Initiating community change, especially catalyzing an increase in positive social impacts and a decrease in negative social impacts, requires a working knowledge of past and current interdependencies with an eye

for facilitating new interdependencies (Kelly, et al., 2000). Rapkin and Mulvey (1990) remind us that to do ecologically sound research, “[o]ur methods should bring us closer to the community” (p. 149). As opposed to many models of inquiry, applying an ecological lens to PAR results in the observation of power and relationship starting from the bottom of the social hierarchy (Hesse-Biber, Leavey, & Yaiser, 2004). This vantage helps to create a complete picture of systems and the complex human transactions within.

Christens and Perkins (2008) suggest that regardless of the rhetoric in CP, most community psychology does not allow the community to set the agenda of research. Although CP may fall short in this arena, there is a central movement toward empowerment in CP – which is a core element of non-tokenistic participation. Rappaport (1990) urges us to ask, “[f]or whose benefit is this research conducted?” (p. 54). By adopting participatory lens and adhering to the principals of ecological validity, empowerment becomes a central focus. Trickett (1990) adds that, “[u]nless grounded in local conditions, empowerment efforts could become another exercise in psychological imperialism or the imposing of external and potentially alien ideology” (p. 213). Tying these two perspectives together leads to the necessarily interconnected nature of ecology and empowerment. Rappaport (1990) also asserts that for researchers with empowerment values, the question of benefit, “is as much a part of methodology as the selection of measures and data-analytic procedures” (p.54). A contextual, ecological perspective allows the researcher to acknowledge and better understand diverse peoples and the impact of policies, interventions, etc. on their particular life and context (Trickett, 1990) – moving the research process toward more valid empowerment efforts. The empowerment lens relates to the second element of the definition of ecological validity in

which the researcher analyzes their place in the ecological topography of the research – including the place and affect they have on participants. This vantage also leads the conscientious researcher toward the promotion of the participants’ well-being.

Prilleltensky (2005) observes that any approach that aims to improve well-being must take into account all domains from individual to collective, recognizing the temporally dynamic ecology of the intended recipient(s) of enhanced well-being. Democratizing the entire research process is one of the major routes to advancing the well-being of participants, often starting with encouraging community members to participate in creating research questions, gathering data, and local sense-making. Increasing participation in the research project not only democratizes the process of creating and disseminating knowledge, but also includes aspects of ecological topography often excluded such as folk culture and colloquial interpretation (Cornwall & Jewkes, 1995; Stoecker, 1999). Some PAR also works to organize communities to build or expand existing relationships within the ecological topography of the chosen setting (Stoecker, 1999). This enhances the sustainability of enhanced well-being, since most research projects have a limited time frame in which to work. This makes the democratization of power extremely important for skill building and efficacy of participants (Nelson & Prilleltensky, 2005).

Maguire (1987) outlines five phases of doing participatory research (adapted from Vio Grossi, Martinic, Tapia, and Pascal [1983] and Hall [1975, 1981], as cited in Maguire, 1987): a) *Organization of the project and knowledge of the working area*: This consists of gathering information and creating relationships with potential participants. b) *Definition of generating problematics*: This consists of problem-posing dialogues aimed

at achieving a deep and critical view of participants' reality and potential issues. c) *Objectivization and problematization*: This consists of linking the experiences within the setting to structural conditions of social reality. Participants are then able to effectively understand and state problems within their setting while taking into account ecological influences. d) *Researching social reality and analyzing collected information*: This consists of participants using available information and local knowledge to develop theories and potential solutions for social transformation. e) *Definition of action projects*: This consists of researchers and participants deciding on what actions to take to address the identified problems. This process moves participants from research objects to empowered beneficiaries and creators of knowledge.

Although levels of participation and extremity of motivation for social change vary from project to project, the phases outlined from Maguire (1987) contain many of the common elements found in PAR literature. Rigor of method and research reliability do not seem to be the strong points of PAR, often taking a far back seat to theory, contextual validity, and values. The methodology of PAR that does emerge from the literature is highly congruent with ecological theory, but requires an adherence to values that some researchers might find overly self-marginalizing.

Nelson and Prilleltensky (2005) point out that one of the main desires of participants in PAR is for the researchers to equalize their power with all involved parties. The process of giving up power can create many problems and is potentially unlikely – or highly impractical – for many research agreements. Maguire (1987) relayed a host of potential drawbacks and problems in conducting PAR, including: The passivity of participants, the necessity of a strong value position, the lack of access to financial and

institutional resources, the lone (or few) researcher being overwhelmed by the project scope, the transfer of project control to participants, identifying and building relationships with community members and community based groups, finding a group to voice collective problems, community or organizational leadership using the research project as a venue to increase their power base, increased knowledge may not lead to increased power or action, and most of all, time. PAR seems to have the greatest possibility for creating ecologically informed change, but this possibility is balanced by enormous amounts of potential drawbacks.

### *Geographic Information Systems (GIS)*

Luke (2005) notes the importance of *geographic information systems* as a contextual method for community researchers. GIS uses spatial mapping to make visual comparisons of aggregated individual data (e.g., census data), yielding striking results not achievable with any other method. The visual representation of data also provides unparalleled means for communicating results to the public and organizations that may lack the time or experience necessary for wading through purely numerical results. Christens, Hanlin, and Speer (2007) assert that GIS has the ability to visually and flexibly display the complexity of a system, leaving space for the natural ambiguity involved in power-conscious research and action. Nicotera (2007) also notes that GIS maps have the potential to display structural neighborhood characteristics uniquely, although care should be taken to mix these results with social indicators to avoid limited understandings of neighborhoods.

GIS maps are commonly used to map crime to determine “hot spots” – and even to attempt crime prediction (see Chainey, Tompson, & Uhlig, 2008). Perkins, Larsen, and Brown (in press) used GIS to gather the majority of their data and then utilized Hierarchical Linear Modeling (HLM) to analyze the data. The GIS map color-coding yielded significant and meaningful results that were inaccessible to HLM alone. Coe, Gibson, Spencer, and Stuttaford (2008) used GIS along with interviews and PAR methods to determine geographic patterns of use of the British “Sure Start” program (similar to the U.S. “Head Start” program). They were able to determine locations of diminished use of the program to target efforts to understand and encourage program use. Especially when used in a mixed-method design, GIS has unique and flexible uses for expanding ecological validity and contextual knowledge.

### *Dynamic Modeling*

*Early dynamic modeling.* After successful careers as an electrical engineer and later an organizational/corporate consultant, Jay W. Forrester realized that his values required him to utilize his skills for the good of society. Forrester (1969) utilized dynamic modeling to understand the problems of urban growth, decay, and renewal. Although the technology available at the time was rudimentary, Forrester gained the attention of the U.S. Congress with his findings on urban decay cycles. Using the computer dynamic modeling program “Dynamo,” Forrester (1969) began the field of *social dynamic theory*.

Forrester (1975) built on the technical success of his previous dynamic modeling by expanding the accompanying theory. Social dynamic theory posited that ecological systems (especially urban systems) are too complicated for intuitive decision-making.

The first factor of major interest that Forrester (1975) discovered in his simulations was counterintuitive ripple effects; when decisions were made in organizations that had seemingly predictable results, apparently chaotic outcomes would result. By establishing and tracking *decision points*, within a system, Forrester (1975) was able to predict the results of decisions with far greater accuracy than experienced intuition and was then able to apply social dynamic theory and computer modeling to numerous organizational, community, and political applications.

*Contemporary dynamic modeling.* Ruth and Hannon (1997) explore dynamic modeling in the corporate workplace. Ecological models based on complex computer network systems are used to predict organizational change outcomes, market behavior, and resource movement. Although using dynamic modeling for profit maximization is not necessarily compatible with the values of ecological theory, the modeling methods are becoming more accessible to broader audiences (Mcgarvey & Hannon, 2004). Not only are the methods for modeling dynamic systems adaptable for ecologically minded social scientists, but the organizational change models already in use can be adapted for human-services organizations seeking to track and predict shifts congruent with their values.

Modern computer-based dynamic models are extremely complicated and difficult to keep current; the complexity of the model can leave room for trouble, but as Hannon (2001) points out, even the failure of a model points to bottlenecks in a system that can be targeted for scrutiny. If model nodes or relationships lag with reality – assuming that other elements of the model are functioning properly – one can see where

counterintuitive or non-predictable change is happening and focus on tracking the specific nuances of the anomalous situation.

One of the main strengths of dynamic modeling is that it can use many different types of data to create and elaborate a model; field data, experimental lab data, historical examples, policy data, and technological innovations have been used in effective models – with many more options available (Breiger, Carley, & Pattison, 2003). Although there is never going to be a fully reliable way to judge the impact of a policy on every level of an ecosystem or determine all of the factors that contribute to phenomena, dynamic modeling provides a promisingly more reliable way to achieve these aims than any other quantitative method. Balancing dynamic modeling's ability to utilize data from almost any source is the complexity of the technology, skills, and coordination required to create and upkeep an effective model. The necessary elements to include dynamic modeling in an ecological research project are beyond the reach of almost all researchers and the education required to understand dynamic models – let alone create one – is likely distasteful to all but the most dedicated technology users. As the software evolves and the methods of measurement evolve, perhaps dynamic modeling will become a more common part of social science research.

## CHAPTER VII

### EVALUATING COMMUNITY PSYCHOLOGY RESEARCH

#### *Sampling*

The sample is taken from all research articles published from 1998 to 2008 in the 3 major journals of community psychology: a) The Journal of Community Psychology (JCP); b) The American Journal of Community Psychology (AJCP); and c) The Journal of Community and Applied Social Psychology (JCAAP). These journals represent the 3 major research outlets for community psychologists. Although the Journal of Rural Community Psychology is also listed on the SCRA web site and the Journal of Intervention and Prevention in the Community is seen by some in CP as an outlet for publishing, neither of these journals has a means of searching titles, keywords, or abstracts. Each journal was searched for key ecological terms found in the reviewed theoretical and research pieces used to create the instrument. Although the ecological analogy is considered central to community psychology, only articles returning ecological search terms were sampled, as it would be unfair to judge the ecological validity of articles with no claims to the theory or methods. The search terms for the title and keyword search were *ecolog\**, contextual, multilevel, multi-level, transactional, interdependence, cycling, adaptation succession, hierarchical linear modeling, ethnography, dynamic modeling, participatory action research, and community based participatory research. These terms represent the derivations of the word ecology (e.g., ecological), alternative terms for ecological (e.g., contextual, multilevel, transactional),

the theoretical terms used in Kelly (1968) for ecological processes, and methods known to be intrinsically high in ecological validity. The article lists were then corrected to make sure that the authors were using the search terms with the same definition as the search intended. Articles were then checked to limit the sample to empirical research articles, excluding purely theoretical works. Based on similar methodology in Davidson, Evans, Ganote, Henrickson, Jacobs-Priebe, Jones, Prilleltensky, and Riemer (2006), 10 articles were sampled from each journal (where available): AJCP returned 54 viable articles, of which 10 were chosen using a random number generator (random.org); JCP returned only 10 viable articles, all of which were included; JCASP returned only 6 viable results, all of which were included ( $n = 26$  total, see appendix C for a complete list of the sampled articles).

### *The Ecological Validity Instrument*

The ecological validity instrument contains matrices with X and Y axes. The instrument itself can be found in Appendix B. Although a more detailed approach can be used to compute ecological validity scores, such as using a rating scale for each cell, the number of articles sampled made such computation prohibitive. Instead, cell content was recorded as a binary value and then summed for a total score. The individual patterns of values on each sheet are revealing about the depth and breadth of ecological validity, as well as trends across research. As a tool for research planning, a more detailed analysis – including ratings within each cell – is recommended for a more full understanding of a project's potential ecological validity and the means to expand both breadth and depth.

After constructing the instrument, five independent raters used the instrument to rate the same research article. The purpose of this test was to determine the pedagogical value of the instrument and its operation. After initial scores were compared, the instructions were modified and expanded, re-administered, and compared again. After this process, the comparison yielded acceptable levels of comparability with intended definitions and results.

*Structure of Evaluation: The X Axis*

Moving beyond a theoretical framework, the instrument used in this project measures the use and application of ecological theory. As both a separate and integrated aspect of the assessment, an understanding of ecological principles adapted within this paper is evaluated. This is not intended as negatively critical, but to judge both the theoretical usefulness of the adaptations and the sophistication of ecological understanding in community psychology. The evaluative framework for measuring ecological validity examines levels, processes and methods in 4 arenas: a) Theory/Conceptualization; b) Measurement of antecedents; c) Action and deliverables; and d) Measurement of outcomes/impact. Each arena is explained below with an example question. Although not necessarily so, these arenas (represented by X axis columns on the instrument) can be seen as temporal: First researchers conceptualize an issue, then research details about etiology and current state, then act, intervene, or disseminate, followed by post comparisons or systematic observations of effects. Within a larger research context, these arenas may happen in cycles or out of sequence.

*Theory/Conceptualization.* This refers to the level of ecological awareness of the researcher(s), as well as the theory consulted to guide the research process. This is the researcher's understanding and elaboration of the level, process, or method to further understand the research phenomenon. This also includes the researcher's use of this understanding to design the research and/or the intervention. This may include the literature review, the researcher's synthesis of applicable theory, or the researcher's specific plan for the research, action, or intervention. This arena may ask: Do the researchers explicate their knowledge of the transactional relationships that may influence the research process?

*Measurement of antecedents.* This refers to the ecological levels and processes that are measured and analyzed prior to and during the initial research process, but before any action takes place. This includes the use of archival and existing data, new measurement by the researcher, etc. For purely exploratory and explanatory research (i.e., most research), this is likely the only measurement that takes place. This arena may ask: How far into the ecological topography of the setting of interest do the researchers delve to understand and measure causes of a given phenomena?

*Action and deliverables.* This refers to the ecological levels and processes that are acted upon or leveraged purposefully in the research process, as well as any material products created (including research manuscripts, presentations, reports, etc.). This may be the full-fledged action component of a PAR project, the publication of a manuscript, or any other intentional use of the research process or results. This also includes associated and recommended actions where appropriate – as when the researcher is evaluating a project, making recommendations as a consultant, or observing phenomena

that they cannot directly influence but about which they wish to raise consciousness. This arena may ask: What organizations were involved in the research intervention? What venues did the researcher choose to release research results?

*Measurement of outcomes/impact.* This refers to the ecological levels and processes that are measured to determine the effect(s) of the research process and action. This arena may ask: What are the long term effects of the intervention? Are community/organizational members' reactions to the research efforts measured effectively?

#### *Structure of Evaluation: The Y Axes*

The Y axes on the instrument represent important ecological components that can be observed in each of the 4 validity arenas just outlined. These 3 components are: a) Ecological levels (Based on Bronfenbrenner, 1979, expanded for comprehensiveness); b) Ecological processes (Based on Kelly, 1968, expanded for comprehensiveness); and c) Ecological methods (Based on Shinn & Rapkin, 2000, expanded for comprehensiveness).

*Levels of ecology.* Each level represents a discrete but interacting level of the ecological topography. The 6 levels are:

1. *Demo-system:* This is the individual level, including intrapsychic phenomena (motivations, emotions, individual behavior, neural processes, etc.).
2. *Micro-system:* This is the interpersonal level, including organizational teams, family phenomena, and immediate environments.

3. *Meso-system*: This level involves multiple micro-systems and their connections, like school, home, and work connections/networks. This includes block-level and small neighborhood interactions.
4. *Exo-system*: This level is the traditional community, including all the major interactions for a definable group and/or place. This may include large neighborhoods, towns, etc.
5. *Macro-system*: This level includes the cultural, societal, and political context for the community and its content.
6. *Geo-system*: This level represents the inhabited globe, spanning global processes like the global economy, global climate change, international politics, etc.

*Ecological processes*. As outlined previously in this paper, the ecological processes are based on natural ecological principles that have been adapted by Kelly (1968) and myself for use in human and community contexts. The 7 processes are summarized below:

1. *Interdependence*: This represents the ecological connections between levels, people, organizations, etc., making up the basis of holistic thinking. This can also include power relationships between stakeholders, researchers, organization workers, politicians, etc.
2. *Adaptation*: This means that units of analysis at each ecological level learn and adapt to dynamic context (i.e. learning organizations, education, organizing efforts, etc.). This can be represented by understanding the adaptation happening in a context or the need to initiate or encourage adaptation in stagnant people, organizations, etc.

3. *Succession*: This represents the evolution of settings over time. This may be closed processes of change or external disturbances from external sources. This can be seen in processes of urban decay and renewal, as well as interventions to catalyze renewal.
4. *Cycling*: Modeled after the first law of energy and the law of conservation of matter (Energy and matter can neither be created nor destroyed), cycling follows the flow of currency, other resources, populations pushed out of neighborhoods, use and abuse of time, etc.
5. *Entropy*: Modeled after the second law of energy (Transfer of energy reduces the quality of energy), the *entropy tax* represents the degrading of energy and resources as they transfer through systems, organizations, etc. This can be seen as the decay of funding as it passes through organizations, the diffusion of responsibility and motivation through meetings, etc.
6. *Centripetal versus Centrifugal focus* (inward versus outward focus): This represents conservation and use of existing and internal resources versus a focus on unlimited growth and external solutions and resources to solve issues. Centripetal strategies include decentralization of processes, focusing on existing strengths and retooling of existing resources. Non-ecologically valid centrifugal strategies include using exterior technical strategies, centralized power and solutions, unlimited growth, externalizing costs of issues, deficit addressing programs, etc.
7. *Diversity versus Homogeneity*: This represents the celebration and cultivation of diversity over conformity and monocultures. This can be diversity of individuals

within a setting, research methods and methodology, culture, diversity of ideas, tailored solutions for individual contexts, etc.

*Methods.* These method categories are adapted from theory and research consulted for this paper, as well as specific terminology and concepts from Shinn and Rapkin (2000). The first category is *temporal representation*; this represents the recognition of temporal changes at a basic level. This element of ecological validity is satisfied by pre/post analysis, measuring longitudinally, retrospective research, time-series analysis, interrupted time-series analysis, dynamic modeling, long-term qualitative analysis, ethnography, etc. Temporal representation is a separate category that can be co-occurring with all other categories.

The next 4 categories represent the research's *level of analysis*. These levels represent scaled increments in analysis that subsume the previous level(s) of analysis (e.g., multi-level analyses contain within-level analyses):

1. *Within-level analysis*: Within-level research (Shinn & Rapkin, 2000) is conducted on a single level of analysis, generally the individual level. This includes measurement at only one ecological level, e.g., using aggregated questionnaires or individual clinical case studies to understand individual behavior.
2. *Multi-level analysis*: Multi-level research (adapted from Shinn & Rapkin, 2000) concerns work conducted on a single level of analysis that replicates or generalizes at two levels or more and/or measurement at two or more levels not linked by analysis. This includes the effective generalization of aggregated data at the organizational level (e.g., organizational climate) and/or the combination of

multiple single-level analyses (e.g., using census block data with interviews to understand the experience of poverty).

3. *Cross-level analysis*: Cross-level research (Shinn & Rapkin, 2000) includes the use of analyses that systematically measure (rather than only theorizing) the relationships within and across multiple levels. This includes qualitative and quantitative approaches like HLM (using qualitative and/or quantitative data), multi-level network analysis, brief ethnography, etc.
4. *Trans-level analysis*: Trans-level research includes analyses that systematically measure the relationships within and across multiple levels over time, sufficient enough to measure stable patterns and dynamic change. This may include time series HLM, dynamic modeling, dynamic network analysis at multiple levels, ethnography, behavior settings research in tandem with higher nested level analyses, as well as many combinations of temporally sensitive mixed method research designs.

## CHAPTER VIII

### RESULTS

The results of this research are mostly descriptive (including direct correlations), as there are no data to compare against and the small sample size limits statistical analyses. Thus, the results consist of summed frequencies, percentages, and central tendencies for the purpose of determining the intersection of the research arenas with levels, processes, and methods that are especially well represented or underrepresented in the sample. Also, several correlations are included to highlight trends in the data and relationships between established and new concepts. Finally, differences in ecological validity across the different journals are reported.

Following are tables depicting the tallied scores from all of the sampled research combined. Each cell represents the percentage of the possible score to indicate how much of the potential ecological validity has been achieved. Also, frequencies are reported in parentheses – with a total possible score of 26 (except where noted). Each column and row has also been summed.

Levels

<b>Levels of Ecological Topography in the Research Process</b>					
<b>Level</b>	<b>Theory</b>	<b>Measurement of antecedents</b>	<b>Action &amp; deliverables</b>	<b>Measurement of outcomes/ impact</b>	<b>Level Totals</b>
1. Demo-system	<b>100%</b> (26/26)	<b>100%</b> (26/26)	<b>34.62%</b> (9/26)	<b>23.08%</b> (6/26)	<b>64.42%</b> (67/104)
2. Micro-system	<b>69.23%</b> (18/26)	<b>65.38%</b> (17/26)	<b>0%</b> (0/26)	<b>0%</b> (0/26)	<b>33.65%</b> (35/104)
3. Meso-system	<b>96.15%</b> (25/26)	<b>96.15%</b> (25/26)	<b>30.77%</b> (8/26)	<b>19.23%</b> (5/26)	<b>60.58%</b> (63/104)
4. Exo-system	<b>88.46%</b> (23/26)	<b>69.23%</b> (18/26)	<b>100%</b> (26/26)	<b>7.69%</b> (2/26)	<b>66.35%</b> (69/104)
5. Macro-system	<b>46.15%</b> (12/26)	<b>19.23%</b> (5/26)	<b>3.85%</b> (1/26)	<b>0%</b> (0/26)	<b>17.31%</b> (18/104)
6. Geo-system	<b>11.54%</b> (3/26)	<b>3.85%</b> (1/26)	<b>3.85%</b> (1/26)	<b>0%</b> (0/26)	<b>4.81%</b> (5/104)
<b><u>Arena Totals</u></b>	<b>68.59%</b> (107/156)	<b>58.97%</b> (92/156)	<b>28.85%</b> (45/156)	<b>8.33%</b> (13/156)	<b><u>Matrix Total:</u></b> <b>41.19%</b> (257/624)

Processes

<b>Ecological Processes</b>					
<b>Process</b>	<b>Theory</b>	<b>Measurement of antecedents</b>	<b>Action &amp; deliverables</b>	<b>Measurement of outcomes/ impact</b>	<b><u>Process Totals</u></b>
Interdependence	<b>100%</b> (26/26)	<b>100%</b> (26/26)	<b>34.62%</b> (9/26)	<b>15.38%</b> (4/26)	<b>62.5%</b> (65/104)
Adaptation	<b>96.15%</b> (25/26)	<b>88.46%</b> (23/26)	<b>30.77%</b> (8/26)	<b>19.23%</b> (5/26)	<b>58.65%</b> (61/104)
Succession	<b>38.46%</b> (10/26)	<b>19.23%</b> (5/26)	<b>7.69%</b> (2/26)	<b>3.85%</b> (1/26)	<b>17.31%</b> (18/104)
Cycling	<b>84.62%</b> (22/26)	<b>65.38%</b> (17/26)	<b>23.08%</b> (6/26)	<b>11.54%</b> (3/26)	<b>46.15%</b> (48/104)
Entropy	<b>7.69%</b> (2/26)	<b>3.85%</b> (1/26)	<b>3.85%</b> (1/26)	<b>3.85%</b> (1/26)	<b>4.81%</b> (5/104)
Centripetal/ Centrifugal	<b>84.62%</b> (22/26)	<b>69.23%</b> (18/26)	<b>30.77%</b> (8/26)	<b>19.23%</b> (5/26)	<b>50.96%</b> (53/104)
Diversity/ Homogeneity	<b>100%</b> (26/26)	<b>100%</b> (26/26)	<b>34.62%</b> (9/26)	<b>11.54%</b> (3/26)	<b>61.54%</b> (64/104)
<b><u>Arena Totals</u></b>	<b>73.08%</b> (133/182)	<b>63.74%</b> (116/182)	<b>23.63%</b> (43/182)	<b>12.09%</b> (22/182)	<b><u>Matrix Total:</u></b> <b>43.13%</b> (314/728)

*Methods*

<b>Methods Used and Consulted in the Research Process</b>					
<b>Method</b>	<b>Theory</b>	<b>Measurement of antecedents</b>	<b>Action &amp; deliverables</b>	<b>Measurement of outcomes/ impact</b>	<b><u>Method Totals</u></b>
Temporal representation	<b>84.62%</b> (22/26)	<b>50.%</b> (13/26)	<b>23.08%</b> (6/26)	<b>11.54%</b> (3/26)	<b>42.31%</b> (44/104)
Within-level analysis	<b>100%</b> (26/26)	<b>100%</b> (26/26)	<b>100%</b> (26/26)	<b>23.08%</b> (6/26)	<b>80.77%</b> (84/104)
Multi-level analysis	<b>100%</b> (26/26)	<b>96.15%</b> (25/26)	<b>26.92%</b> (7/26)	<b>15.38%</b> (4/26)	<b>59.62%</b> (62/104)
Cross-level analysis	<b>76.08%</b> (19/26)	<b>69.23%</b> (18/26)	<b>7.69%</b> (2/26)	<b>3.85%</b> (1/26)	<b>38.46%</b> (40/104)
Trans-level analysis	<b>23.08%</b> (6/26)	<b>7.69%</b> (2/26)	<b>3.85%</b> (1/26)	<b>3.85%</b> (1/26)	<b>9.62%</b> (10/104)
<b><u>Arena Totals</u></b>	<b>76.15%</b> (99/130)	<b>64.62%</b> (84/130)	<b>32.31%</b> (42/130)	<b>11.54%</b> (15/130)	<b><u>Matrix Total:</u></b> <b>46.15%</b> (240/520)

*Comparisons and Correlations*

Additional frequencies were tallied based on exploratory questions and correlations were run based on these frequencies. The comparisons and correlations are based on the following questions: a) How do scores compare between original levels outlined in Bronfenbrenner (1979) versus levels added for this paper? b) How do scores compare between original processes outlined in Kelly (1968) versus processes added for this paper? c) How do scores compare between more traditional research arenas (Theory/ conceptualization and measurement of antecedents) versus action oriented research

arenas (Action/deliverables and measurement of outcomes/impact)? d) How do scores on the 3 matrices (Levels, processes, and methods) compare to each other?

<b>Comparisons and Correlations</b>			
<b>Variable</b>	<b>Percentage/ Frequency</b>	<b>Correlation (Spearman's Rho)</b>	<b>Significance (2-tailed)</b>
Bronfenbrenner's (1979) Levels	<b>44.47%</b> (185/416)	.518**	$p = .007$
New Levels	<b>34.62%</b> (72/208)		
Kelly's (1968) Processes	<b>46.15%</b> (144/312)	.620**	$p = .001$
New Processes	<b>39.1%</b> (122/312)		
Traditional Research	<b>67.41%</b> (631/936)	.272	$p = .179$
Action Oriented Research	<b>19.23%</b> (180/936)		
Levels	<b>41.19%</b> (257/624)	Lev. X Proc. = .610** Level X Meth. = .591**	$p = .001$ $p = .001$
Processes	<b>43.13%</b> (314/728)	Proc. X Lev. = .591** Proc. X Meth. = .698**	$p = .001$ $p = .000$
Methods	<b>46.15%</b> (240/520)	Meth. X Lev. = .591** Meth. X Proc. = .698**	$p = .001$ $p = .000$

### *Representation of Ecological Validity Elements*

In an effort to determine which elements of ecological validity are overrepresented or underrepresented in the sampled community psychology research, cells of data with scores outside of 1 standard deviation were gathered. The sample of 26 articles ( $m = 11.26$ ,  $sd = 9.82$ ) with 72 total cells has a total of 14 cells below 1 standard deviation and 20 cells above 1 standard deviation. Although an arbitrary margin would

reveal many more elements underrepresented in the sampled research (and fewer overrepresented), calculating the SD is more driven by the data.

<b>Representation of Ecological Elements by Standard Deviation</b>		
<b>Below 1 SD (&lt;1.44)</b>	<b>Above 1 SD (&gt;21.08)</b>	
Micro-level: Action/Deliverables	Demo-level: Theory/Conceptualization	Cycling: Theory/Conceptualization
Micro-level: Measurement of Outcomes	Demo-level: Measurement of Antecedents	Centripetal/Centrifugal: Theory/Conceptualization
Macro-level: Action/Deliverables	Meso-level: Theory/Conceptualization	Diversity/Homogeneity: Theory/Conceptualization
Macro-level: Measurement of Outcomes	Meso-level: Measurement of Antecedents	Diversity/Homogeneity: Measurement of Antecedents
Geo-level: Measurement of Antecedents	Exo-level: Theory/Conceptualization	Temporal Representation: Theory/Conceptualization
Geo-level: Action/Deliverables	Exo-level: Action/Deliverables	Within-level Methods: Theory/Conceptualization
Geo-level: Measurement of Outcomes	Interdependence: Theory/Conceptualization	Within-level Methods: Measurement of Antecedents
Succession: Measurement of Outcomes	Interdependence: Measurement of Antecedents	Within-level Methods: Action/Deliverables
Entropy: Measurement of Antecedents	Adaptation: Theory/Conceptualization	Multi-level Methods: Theory/Conceptualization
Entropy: Action/Deliverables	Adaptation: Measurement of Antecedents	Multi-level Methods: Measurement of Antecedents
Entropy: Measurement of Outcomes		
Cross-level Methods: Measurement of Outcomes		
Trans-level Methods: Action/Deliverables		
Trans-level Methods: Measurement of Outcomes		

### *Between-Journal Comparisons*

Sampling and analysis yielded meaningful contrasts between the three sampled journals. As noted previously, sampling had varying degrees of success across the chosen journals; the American Journal of Community Psychology returned 54 articles, the Journal of Community Psychology returned 10 articles, and the Journal of Community and Applied Social Psychology returned only 6 articles. This indicates five times as many ecologically oriented articles in AJCP than JCASP. This may be due to trends in editing, the lack of focus on ecological theory and methods in applied social psychology, differences between domestic and international research, or percentage of research articles compared to theoretical articles in each journal. Interestingly, the means for total ecological validity for each journal tell a different story; AJCP ( $M = 28.40$ ,  $SD = 5.70$ ) and JCP ( $M = 29.40$ ,  $SD = 9.03$ ) had similar means, while JCASP ( $M = 39.5$ ,  $SD = 12.01$ ) had a much higher mean. To further explore differences between journal scores, I ran an analysis of Variance (ANOVA) after testing for homogeneity of variance using Levene's statistic ( $2,23$ ) = 2.229,  $p = .130$ , indicating acceptable homogeneity. The main effect of an ANOVA is barely significant  $F(2, 23) = 3.444$ ,  $p = .049$  and the most forgiving post hoc test (Gabriel) had no significant results,  $p = .991$  for the AJCP comparison with JCP,  $p = .059$  for the AJCP comparison with JCASP, and  $p = .095$  for the JCP comparison with JCASP. Considering the descriptive differences between means, the lack of significance in the post hoc tests is likely due to high variance.

## CHAPTER IX

### DISCUSSION

#### *Caveats*

Although much effort has gone into the creation of this instrument, an ecological analysis would not be complete without understanding the ecology of published research articles. As mentioned previously, it is understood that publishing ecologically valid research has been devalued compared to more positivistic and traditional research. Also, a single article is often compressed due to publishing constraints and doubtlessly does not represent the entire conceptualization by the researcher(s). The methods and results are likely better represented than the theoretical orientation and conceptualization. The article may also represent one piece of a larger mosaic (across the project or over time) of research that has greater ecological validity than the sole published article. Additionally, satisfactory adherence to all elements of ecological validity is nearly impossible (and such a goal is not assumed). Such validity is likely only attained through collaboration over time with other researchers and community members – as well as through dialectics within research guilds and across fields. And, as mentioned previously, each cell can represent varied use and/or measurement of a concept. A concept may be theorized or measured with many differing magnitudes – from minimal effort to complete devotion – and still be credited. This means that research articles with the same score may represent varied actual levels of ecological validity.

It is also important to note that some cells are fully populated due to the act of publishing research findings – which each article has obviously done. By disseminating research to the academic community, each research piece was given credit for action at the *exo*-level. This inflates the score for the *exo*-level total and for action in general, but disseminating research must be included as a viable action – albeit a limited one. Publishing research also gets marks for within-level action, as publication is a method of action that affects the research community. This means that the within-level total is higher than if publication were not counted.

### *Levels*

The totals for focus on elements of ecological validity by levels displays distinct favor for certain levels over others; the highest score is for the *exo-system* (66.35%), although this is partially due to credit for publishing – without which the percentage of potential ecological validity would drop to 41.3%. Second is the *demo-system* (64.42%), which supports claims that community psychologists still significantly focus on the individual level. Next highest is the *meso-system* (60.58%), where organizational and institutional work is conducted. These three levels are considerably more researched than any other level. These results paint a picture of community psychologists primarily focusing on the individual level and organizations.

Family systems and teams at the *micro-system* level fare in the mid to low-range of ecological validity (33.65%). This level seemed often skipped in favor of a dichotomous model of individual-in-organization, individual-in-community, or individual-in-society. The *macro-system* was conceptualized to less than half of its

potential and was rarely included in other arenas. This may be due to lack of focus on societal factors in community psychology – although the distinct drop from conceptualization to measurement and action points to a lack of priority, skill, or some other factor(s), rather than purely a lack of focus on the importance of *macro-level* influences. The *geo-level* is almost absent from the research, which is expected considering the lack of environmental focus in CP. Although (as noted earlier) this is changing, the sample displays an almost total lack of acceptance of the influence of natural forces and processes on community or individual well-being.

The lack of focus on the *geo-level* may occur because the biosphere is so rarely mentioned in CP literature (see Levine, Perkins, & Perkins, 2005 for a notable, albeit brief exception). To lend construct validity to the levels added for this analysis, Bronfenbrenner's (1979) well-known levels were compared with the added demo-level and geo-level. These new levels displayed a medium-high correlation ( $.518, p = .007$ ) with existing levels, indicating that ecologically minded researchers tended to focus on raising ecological validity across all levels, albeit less so at the *geo-level*.

Of particular note, action and measurement of impact were particularly low (below 1 standard deviation [SD]) for the *micro*, *macro*, and *geo* levels; this indicates that action and the measurement of its effects are conspicuously missing from families, teams, government, societies, and the natural environment – although action doesn't fare well throughout. Additionally, measurement of antecedents was below 1 SD at the *geo-level*.

On a potentially positive note, theory and conceptualization at the *demo*, *meso*, and *exo* levels scored more than 1 SD above the mean, as well as measurement of antecedents at the *demo* and *meso* levels. Action at the *exo-level* also scored above 1 SD

due to publication. These scores can be seen as a strength of CP research, but an alternative should be explored; with limited resources, should CP be focusing so heavily on elements of the ecology in research that are already overrepresented by mainstream psychologists? Perhaps community psychologists would be ecologically better balanced by focusing less on the *demo-level* and more on other levels of a system's ecology.

### *Processes*

Kelly, et al. (2000) note that *interdependence* is the conceptual cornerstone of ecological thinking. Not surprisingly, *interdependence* achieved the highest score (62.5%) followed closely by *diversity versus homogeneity* (61.54%). This indicates that ecologically oriented research in CP has a solid grasp on *interdependence*, as well as the need for the fostering and celebration of diversity in communities, research, and individuals. Adherence to *interdependence* and *diversity versus homogeneity* also garnered scores above 1 SD in the arenas of *theory* and *measurement of antecedents*. These scores point toward the accepted importance of one of the processes added for this analysis; adherence to Kelly's (1968) processes correlate at a medium-high level (.620,  $p = .001$ ) with adherence to the processes added for this analysis – excluding *cycling* which is a combination of Kelly's (1968) *cycling of resources* and additional concepts. Again, this correlation adds construct validity to the added elements.

*Adaptation* garnered solid adherence (58.65%) as an element of ecological validity in the sampled research, which is expected due to CP's focus on the balance between individuals adapting to systems versus fostering and creating niches in systems for individuals. Adherence to the concept of *adaptation* also scored above 1 SD in the

arenas of *theory* and *measurement of antecedents*. Although systems change is not as common as advertised in CP, it still remains a priority that is evidenced by a focus on understanding the process of *adaptation*.

About half of the ecological validity potential for *cycling* (46.15%) and *centripetal versus centrifugal focus* (50.96%) was fulfilled. Although much of the content contained within the *cycling* process has been present in CP research since Kelly (1968), understanding, measurement, and action relating to energy and resource flows was lower than the other “traditional” ecological processes. Still, the conceptualization of these two processes fell above the 1 SD mark. Linked with the higher level of focus on *interdependence*, this may mean that community psychologists generally understand the existence and necessity of networks, but lack a complete understanding of how resources and energy move through these networks. This is congruent with the similar score for *centripetal versus centrifugal focus*, as understanding internal, contextual, efficiency-based solutions to community problems goes hand in hand with understanding resource flows. Still, these scores show a high enough level of focus to show that CP is moving in the right direction, especially in the arena of theory and conceptualization.

*Succession* (17.31%) and *entropy* (4.81%) were severely underrepresented in the sampled literature. These processes are also related, as *entropy* can be seen in the evolution of settings (*succession*); the process of *entropy* can appear as urban decay, but may also be seen as *entropy* in other levels of an ecology caused by urban renewal on other levels. The *measurement of antecedents*, *action*, and *measurement of impact* arenas for *entropy* also fell below the threshold of 1 SD – as did the *measurement of impact* arena for *succession*. The general lack of focus on action in the sampled research is

congruent with a lack of focus on *succession*, as understanding the prevailing evolution and the disturbance(s) necessary to change trends in settings are necessary precursors to successful community action.

### *Methods*

Less than half (42.31%) of the ecological potential for a basic level of *temporal representation* was reached by the sampled research. Only half (50.%) of the research measured antecedents with a basic level of temporal methods. Interestingly, *theory and conceptualization* for *temporal representation* scored above 1 SD – even though the total scores were moderate at best. This means that half of community psychology research does not provide evidence for change over time at any level of the setting or for its inhabitants – set in tension against a very high level of temporal theorizing. This indicates a lack of methodological knowledge, since community psychology researchers are highly conscious of the importance of *temporal representation* but do not measure it half of the time. Obviously, without a basic level of measurement, it is impossible to build toward understanding dynamic patterns necessary for *trans-level* research.

As each increase in level of method(s) subsumes the previous level(s), it is inevitable that *within-level* research would have the highest adherence, followed by each higher level in sequence. The meaningful part of the results is the difference in earned potential of ecological validity for each level. *Within-level* research (bolstered by the action column's scores for publishing) garners a very high level of adherence (80.77%), scoring higher than 1 SD for *theory/conceptualization*, *measurement of antecedents*, and

*action*. This is predictable, since *within-level* methods are extremely basic research and are necessary to claim any research method at all.

Beyond basic methods, almost all (96.15%) of the sampled research conducted *multi-level* research methods, even though total adherence to this level is more moderate (59.62%). *Multi-level* adherence also scored above 1 SD in both *theory/conceptualization* and *measurement of antecedents*. Such multi-level comparisons are the beginning of understanding the ecology of phenomena, thus, high adherence is a sign of basic ecological research.

*Cross-level* analyses, as advanced by Shinn and Rapkin (2000), had an overall adherence level of 38.46%, although 76.08% of research theorized about *cross-level* measurement and 69.23% performed some *cross-level* method. This means that a surprisingly high amount of community psychology research is operating within the category of *cross-level* methods, even though *cross-level* action and measurement of outcomes is quite low; in particular, *cross-level* measurement of outcomes scored below 1 SD. This is congruent with the overall disparity of ecological validity between more traditional research and action oriented work. This may also point to a lack of training or knowledge in how to carry out action across multiple levels; such a significant drop from *theory* and *measurement of antecedents* to *action* and *measurement of outcomes* indicates that something more significant than a mere disconnect is at work.

As expected, trans-level analysis scored relatively low on ecological validity adherence (9.62%). Considering the time, relationships, coordination, and skills required to carry out such research, it is not surprising that only 7.69% of the research did any measurement using *trans-level* methods. Additionally, *action* and *measurement of*

*outcomes* for *trans-level* methods scored below 1 SD. It is more surprising that only 23.08% of the research sample even theorized about *trans-level* measurement. Barker (1963) notes the difficulty in establishing patterns within a system over time, but emphasizes its importance for understanding settings. Also, without even conceptualizing systems' dynamic and cross-level nature over time, the likelihood of developing means of effectively measuring such patterns are quite unlikely.

### *The Big Picture*

Total adherence to ecological validity is 43.32%. Although this figure represents less than half of potential adherence, it is high enough to indicate a commitment by community psychologists to ecological validity. This is bolstered by the rate of theory and conceptualization within the sampled research, which totaled 72.44%. This generally indicates a need for training in following through with the ecological analogy, rather than only providing what Shinn (1990) refers to as “lip service” (p. 126).

Comparing adherence to ecological validity across the matrices shows that all three major categories seem to share similar levels of fidelity; *levels* (41.19%), *processes* (43.13%), and *methods* (46.15%) all fall within 9% below half of the potential scores. Additionally, the construct validity of the instrument, especially its inclusion of the 3 major categories, is supported by the similarity of adherence across matrices; levels and processes correlate at a medium-high level ( $.610, p = .001$ ), levels and methods also correlate at a medium-high level ( $.591, p = .001$ ), while processes and methods correlate at a high level ( $.698, p = .000$ ). It is important to note that each matrix may have different conceptual or ecological value, but the relative similarity of scores across the matrices

and correlations between them indicates that one conceptual group is not favored over the others.

The data portray a general lack of focus on change and measurement of its impact; While 67.41% of potential ecological validity was achieved in the traditional research arenas of *theory/conceptualization* and the *measurement of antecedents*, only 19.23% of potential ecological validity was achieved in the *action* and *measurement of impact* arenas. Even if research is designed to inform interventions or practice rather than carry them out, documenting the success of interventions and practice should be more prevalent in community psychology literature. It is also interesting that these two pairs of research arenas do not correlate ( $.272, p = .179$ ). Kelly, et al. (2000) state that action is an essential element of ecological validity, but this lack of correlation means that connections between ecological thinking as *input* and the resultant action as *output* are not recognized by community psychology researchers. Perhaps making a strong case for action as an essential element of ecological validity may guide CP toward further action in their research.

## CHAPTER X

### CONCLUSION

Ecological theory is a useful guide that has enriched contemporary social science research. Because of its far-reaching applications and implications, it is difficult – if not impossible – to separate ecological theory from its associated values. Most proponents of ecological theory – although aware of their values – do not use theory to push specific value orientations, instead attempting to level the playing field of power so that all values have a chance to be heard in the debate. Still, the values of the researcher play an important role in the research process, especially if the goal is to inform action. Arne Naess asserts that, “[o]bjective science cannot provide principles for action (1976/1989, p. 40).” Ecological theory seems to demand action and by definition defies the idea of objectivity.

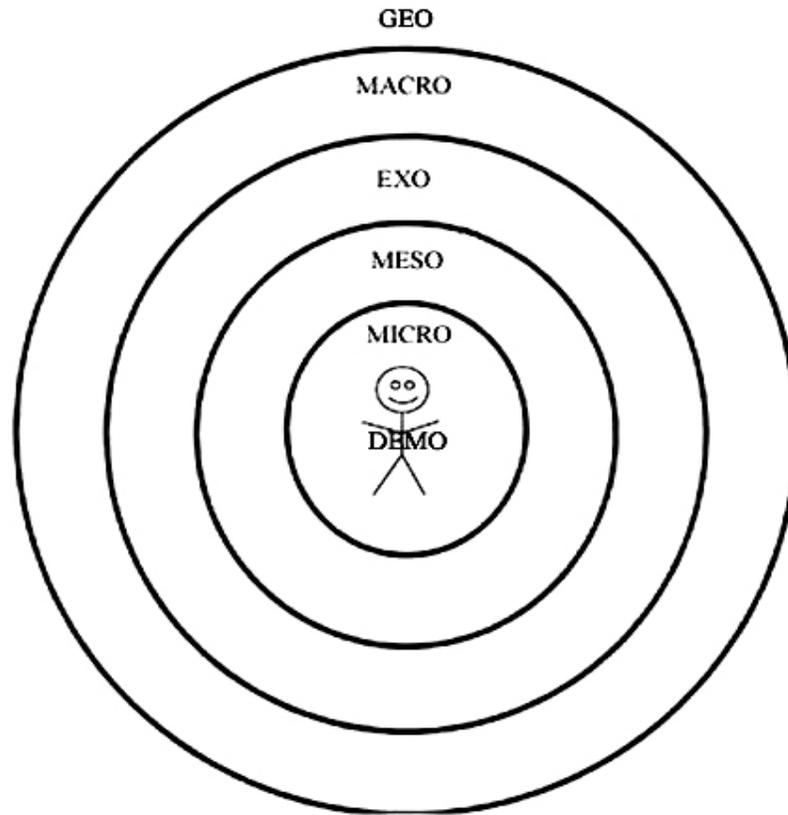
Community psychology has accepted the ecological analogy as a core tenet of its guiding principles. The results of this research show that there is already a strong base of ecological validity in community psychology research but there is much room for improvement. The path from our current base to strong methodology and action seems to lie in a resurgence of ecological thinking, training in ecological methods, and – what I hope I have provided – a detailed guide to raising the level of ecological validity in community research. The values of our field often reject positivism and its related concepts (e.g., validity and reliability), but retooling the concept of validity in the image

of ecological research and action seems a worthy effort that avoids throwing out the validity baby with the positivist bathwater.

Perhaps when being guided by a theory that has strong related values, it is even more important to test the theory and establish frameworks for its adherence. Ecological theory has the potential to be tested through direct means, through the triangulation of multiple methods, and through the systematic measurement of adherence to its tenets – essentially ecological validity. Although some may feel that such testing clutters the path for value-based action, it actually adds legitimacy and explores the nuances of ecological theory, keeping it as alive as the phenomena that it observes. This process not only supports and legitimizes ecological theory, but also paves the way for effective and congruent theory-based methodology for research and action.

Appendix A

Ecological Levels (Expanded)



Adapted from Bronfenbrenner (1979)

## Appendix B

<b>Ecological Validity Instrument</b>					
Author(s):	Year:	Journal:	AJCP	JCP	JCASP
<b>Levels of Ecological Topography in the Research Process</b>					
	Theory/Conceptualization	Measurement of antecedents	Action & deliverables	Measurement of outcomes/impact	
1. Demo-system					
2. Micro-system					
3. Meso-system					
4. Exo-system					
5. Macro-system					
6. Geo-system					
<b>Ecological Processes</b>					
	Theory/Conceptualization	Measurement of antecedents	Action & deliverables	Measurement of outcomes/impact	
Interdependence					
Adaptation					
Succession					
Cycling					
Entropy					
Centripetal/ Centrifugal					
Diversity/ Homogeneity					
<b>Methods Used and Consulted in the Research Process</b>					
	Theory/Conceptualization	Measurement of antecedents	Action & deliverables	Measurement of outcomes/impact	
Temporal represent.					
Within-level analysis					
Multi-level analysis					
Cross-level analysis					
Trans-level analysis					

## Appendix C

### Sampled Research Literature

- Allen, N. E. (2005). A multi-level analysis of community coordinating councils. *American Journal of Community Psychology, 35*(1/2).
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