ISSBD Bulletin (Print) ISSN 2040-5235
ISSBD Bulletin (Online) ISSN 2040-5243

ISSBD Bulletin

Number 1 Serial No. 73

Supplement to International Journal of Behavioral Development Volume 42 Issue 3 May, 2018

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DYNAMIC SYSTEMS APPROACH

Main Editor
Karina Weichold

ISSBD Bulletin
Department of Psychology
University of Jena, Am Steiger 3/Haus 1
D-07743 Jena, Germany
Email: karina.weichold@uni-jena.de

Co-Editor
Deepali Sharma

ISSBD Bulletin
Department of Psychology
Christ University, Hosur Road
Bangalore 560029, India
Email: deepali l sharma l @gmail.com

Introduction to Dynamic Systems Approach

Karina Weichold & Deepali Sharma
Email: karina.weichold@uni-jena.de

Researchers in the field of developmental science are interested in gaining insights into inter-individual variability in intra-individual change over time. The detection of dynamic developmental mechanisms can help us to understand the causes of change in adaptation patterns and apply these findings in practice. Using static developmental models and the assumption of linearity of development dominates the field; researchers often work with large data sets and rely on the analysis of independent variables to predict a developmental outcome. In contrast, with an explicit consideration of humans' complexity and the dynamic interaction of various complex systems over time, the in-depth study of individual developmental processes may provide a fascinating new avenue for developmental science, as proposed by Dynamic Systems Theory.

In this Special Section of the ISSBD Bulletin, we want to introduce Dynamic Systems Theory and associated research methods to our readers. David Witherington, Paul van Geert, and Peter Molenaar are important proponents of the theory, and we are delighted to introduce their presentations of the topic to our readers. In addition, Matthias Reitzle commented on these three papers, thereby stressing the importance of individuality and complexity in human functioning not only in theory, but also in the selection and application of research methods. Our hope is that the idea of dynamic systems and its associated methods will be introduced to the broad readership of the Bulletin, and that this may also stimulate its application in science and practice.

This issue of the Bulletin also contains information from the society. First, we present a report on the 12th ISSBD African Regional Workshop, written by Kwesi Wilson and colleagues. This report gives a nice example of the society's continuous activities to promote the careers of young developmental scientists within their regions around the world. Also, the organizing team from Gold Coast, Australia present an update on the preparations of the 25th ISSBD Biennial Meeting – we are all looking forward to this exciting event. Some weeks ago, we learned about the death of our colleague Professor Augustine Bame Nsamenang, who was actively engaged in the society over many years, and in particular involved in promoting ISSBD on the African continent. Therese Tchombe wrote a moving obituary in honor of Bame Nsamenang which we are happy to share with the members of the society.

We hope that the readers of the ISSBD Bulletin enjoy this issue. It is a great pleasure to organize the special section on Dynamic Systems, acknowledging new avenues in the theory and methods of developmental science. If you have any comments or replies relating to the special section or the organization of the ISSBD Bulletin, please do not hesitate to contact the editorial team.

Revolutionizing the Study of Process in Development

David C. Witherington

University of New Mexico, Albuquerque, USA
Email: dcwither@unm.edu

At the heart of all inquiry into human development lies the study of process—of *how* development actually occurs. Over the last 25 years, a revolutionary approach to the study of process, born from the mathematics of nonlinear dynamics and grounded in the embodied and embedded activity of individuals in time and context, has surfaced and prospered within developmental science (Hollenstein, 2011; Witherington, 2015). That revolutionary approach is the Dynamic Systems (DS) approach, a perspective on process in development that embraces novelty and nonlinearity; emergence and self-organization; distributed causality, *internal* relations, and iterative dynamics; and variability in real-time functioning, both within and across individuals and contexts (Lewis, 2000; Thelen & Smith, 1994; van der Maas, 1998; van Geert, 1994; van Geert & Steenbeek, 2005). It's an approach that markedly contrasts with traditional, mechanistic views of process, views in which all complexity in the universe reduces to a bedrock set of discrete, independent elements and their linear, additive relations (Reese & Overton, 1970).

So far, however, nothing in this conceptual description of the DS approach marks the approach as particularly revolutionary, at least within developmental science circles. In fact, anyone familiar with the history of developmental science should recognize that the same kind of "dynamic" approach to process in development was already evident in the theorizing of Continental-European developmental psychologists like Piaget, Werner, Vygotsky, and Stern during the first decades of the 20th century (van Geert, 1998a; Witherington, 2015). How, then, has the DS approach revolutionized the study of process in developmental science? For some prominent proponents of the DS approach, such as Paul van Geert and Hans van der Maas, the revolutionary significance of the approach arrives not so much in its conceptualization of process but in the *analytic* innovation that it brings to the study of process in development (e.g., van der Maas & Raijmakers, 2009; van Geert, 1998b, 2004). At its base, the DS approach to development is a set of analytic tools and geometric modeling techniques for describing and predicting change in all its complexity, borrowed from the interdisciplinary field of nonlinear dynamics and applied to the study of developmental phenomena. These tools, according to van Geert, van der Maas, and others, serve to consolidate and give mathematical realization to the dynamics thinking that characterized early 20th century Continental-European developmental theory. In effect, the tools of nonlinear dynamics have revolutionized how we actually map and model developmental process, conferring mathematical legitimacy on classic systems conceptualizations of psychological development.

Other prominent proponents of the DS approach to development, such as Esther Thelen, Linda Smith, and John Spencer, have painted the approach in more radical, *conceptually* innovative terms. Seizing on the grounding of the science of nonlinear dynamics in ceaseless, real-time variability and fluctuation, these proponents have touted the DS approach not just as a set of analytic tools but also as a fundamental reconceptualization of development itself—a reconceptualization that effectively *reduces* the concepts of development and developmental-time processes to the here-and-now, real-time dynamics of any given system's concrete activities in context (Spencer & Perone, 2008; Spencer, Perone, & Buss, 2011; Thelen & Smith, 1994). Their reconceptualization takes its cue from the fact that advances in the mathematical formalization of nonlinear systems first found systematic application in the physical sciences through the study of certain simple, *inorganic* systems under far-from-equilibrium conditions. The famous Belousov-Zhabotinskii chemical reaction, in which remarkably complex patterning arises in a glass dish mixture of malonic acid, bromate ions, and a catalyst under certain conditions of temperature, serves as one such example. The spontaneous pattern formation and increasing complexity of pattern that arise under these and other inorganic chemical conditions resemble in many respects the spontaneous pattern formation and increasing complexity that we see in the transformative changes characteristic of organic, developing systems. So, as DS proponents like Thelen, Smith, and Spencer have argued, couldn't the complexity of organic developmental form and function arise from the same basic iterative dynamics that inform spontaneous pattern generation in inorganic, physiochemical systems pushed toward far-from-equilibrium conditions?

In their highly influential and trend-setting 1994 book treatment of the DS approach (as well as their 1998 and 2006 *Handbook of Child Psychology* chapters), Thelen and Smith systematized this argument by suggesting that the same basic class of process dynamics that are responsible for the generation of order and patterning in nonliving systems (such as hurricanes and whirlpools) also account for the generation of real-time, organized activity in the living world (i.e., the specific, real-time behavior of organisms in context) as well as the development of new levels of organization in living systems. So, for example, the dynamics that account for how a child breaks into a running motion from a walking gait in real time are of the same basic class of processes as those that account for the *developmental emergence* of the *ability* to run itself, a new level of motor organization in the child. For Thelen and Smith, this meant that "dynamic principles erase the gap between real-time assembly of behavior and its assembly over ontogenetic time" (Thelen & Smith, 1994, p. 129), that "developmental time is continuous with and indeed fabricated from real-time experience" (p. 304), and that development itself is

simply "a history of past here and nows" (p. 216), an "accrual of real-time events" (p. 244). From their vantage point (and that of other DS proponents who align with their "Bloomington" approach, as contrasted with the "Groningen" approach of van Geert and others; see van Geert & Steenbeek, 2005, for discussion of the contrast), the orderly sequence of organizational transformations that characterizes living systems across developmental-time is *nothing but* a quantitative accumulation of real-time dynamics unfolding in the particularities of local context—real-time dynamics of the same variety as those found in the inorganic world for systems driven far-from-equilibrium.

Deacon (2012), among others, has cautioned against blindly generalizing a conceptualization of process based on the self-organizing dynamics of inorganic phenomena to the world of organic phenomena, given that the living and nonliving worlds qualitatively differ at the level of *organization* of dynamic process itself. After all, in most nonliving, open systems, the emergence and maintenance of spontaneous organization and pattern depend on boundary conditions *external* to the system itself. No autonomous activity on the part of the system is required to explain its dynamics of spontaneous organization. Some nonliving, open systems, like the candle flame, can promote their own order within narrowly constrained environmental circumstances but are limited in not being able to "maintain the property of being self-maintenant" (Allen & Bickhard, 2011, p. 108; Bickhard, 2009). Living systems, however, are *recursively self-maintenant* and can therefore generate the very boundary conditions required for creation and maintenance of their own self-organization (Bickhard, 2009; Ruiz-Mirazo & Moreno, 2004). As a consequence, explaining the process dynamics of living systems, unlike those of nonliving systems, requires notions like agency, purposefulness, and end-directedness. This means, contrary to Thelen, Smith and their Bloomington approach to DS, that a full understanding of any system's dynamics is necessarily and meaningfully constrained by the nature of that system's organization. Living and nonliving systems provide qualitatively different framings for understanding the real-time dynamics involved in the emergence and maintenance of order and patterning in these systems—framings that, in turn, necessarily entail different forms of process explanation.

Within the context of living systems themselves, Thelen and Smith's view of the DS approach and its revolutionary impact also contravenes classic Continental-European developmental theorizing by reducing developmental phenomena and processes to the dynamics of real-time change. Classic developmental theorizing has long maintained a critical distinction between *synchronic* and *diachronic* processes (Campbell & Bickhard, 1986; Piaget, 1971). Synchronic processes correspond to the real-time dynamics of behavior or activity generation in any given context—the processes, for example, by which one reaches for an object or solves a problem in the here-and-now. Diachronic processes, in contrast, correspond to the dynamics of change that we see over a span of developmental time—the *developmental* processes by which reaching or problem solving skills first emerge in one's organizational repertoire of abilities. Campbell and Bickhard (1986) specifically characterize diachronic processes as metaprocesses "because they are processes that change other [synchronic] processes" (p. 14). Falling under the general rubric of diachronic processes in the study of psychological development are well-known examples like differentiation and integration, as in Werner's (1957) famous orthogenetic principle; equilibration (Piaget, 1985); and reflective or reflecting abstraction (Campbell & Bickhard, 1986; Piaget, 2001).

For DS proponents like van Geert and van der Maas, the tools of nonlinear dynamics are utilized *in the service* of formalizing, elucidating and elaborating such a critical distinction in developmental theory. But for DS proponents like Thelen, Smith, and Spencer, the distinction between synchronic and diachronic processes is, perforce, illusory and explanatorily vacuous. For these latter proponents, developmental-time dynamics are simply an epiphenomenal outgrowth of real-time dynamics—merely a descriptive rendering over extended time of what is fully explained at the level of the here-and-now dynamics of activity-in-context. What they fail to realize is that developmental-time processes, *by virtue of their abstraction from real-time dynamics*, add a level of process explanation to our understanding of developmental phenomena that is *irreducible* to the process explanation provided by a charting of real-time dynamics alone. Developmental-time dynamics capture the directionality, irreversibility, and sequencing of phenomena that arise over extended periods of time like weeks, months, and even years. As such, these diachronic processes are explanatory in their own right; they abstract across a wide temporal swath of real-time dynamics and across a wide variety of real-time dynamics, and in doing so, they lend order and regularity to our understanding of the real-time dynamics themselves as well as to developmental-time phenomena. Consider that any given kind of developmental-time process is likely to encompass many different varieties of content in real-time dynamics when those dynamics are examined across different living systems and across different systems of functioning within any given individual. What is common to all of these varieties of content in real-time dynamics, when examined from the vantage point of developmental-time, is a certain kind of directionality and sequencing. In the case, for example, of a diachronic process like differentiation, this directionality and sequencing consists of movement over time from homogeneous to heterogeneous organization, from diffuse and global to increasingly specific patterning. Characterizing the dynamics of a system over extended periods of time as "differentiation" thus renders intelligible an otherwise multiplicity of real-time dynamics by framing those dynamics in common terms of directionality and sequencing (Raeff, 2016). Yes, developmental-time dynamics emerge from real-time dynamics, but they also necessarily frame and contextualize our understanding of the real-time dynamics from which they arise.

The DS approach to development has significantly revitalized a thoroughgoing process orientation to the field of developmental science. Its revolutionary impact is undeniable. But the nature of that revolutionary impact remains a point of contention within DS circles. As a set of mathematical modeling tools for promoting the synthesis of classic Continental-European process orientations in developmental theory, the DS approach to development beautifully instantiates, enhances and elaborates the principles of a *developmental perspective*—the perspective forged by thinkers like Piaget, Werner, Vygotsky and Stern. But construed

as a reconceptualization of development itself, the DS approach threatens to eliminate the very idea of a developmental perspective, losing sight of the developmental-time dynamics within which all real-time dynamics of living, developing systems are necessarily embedded. Applications of the science of nonlinear dynamics to the field of development have already yielded major steps forward in the study of how development actually occurs. But given that some prominent proponents of the DS approach espouse a new breed of reductionism in the approach's name, such applications also clearly harbor the potential for steps backward in our discipline—steps that should be resolutely resisted for the sake of preserving a truly developmental science.

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Development, Complexity and Dynamical Systems

Paul L. C. van Geert

University of Groningen, The Netherlands
Email: paul@vangeert.nl

The aim of this article is to present the fundamental properties of dynamical systems, and to show that dynamical systems are "natural" models for the processes of development, which occur on a variety of timescales. Various dynamical systems techniques for studying developmental processes are discussed. Developmental processes are also characterized by complexity. After explaining the basic features of complexity, the article provides some examples of how the complexity of developmental processes may be captured and empirically studied.

A process look at development

The long-term (developmental) time perspective

Human development is the process of long-term changes in important properties and dispositions, such as cognition, motivation, social functioning, language, motor skills, etc. Development is an irreversible process, and exists alongside processes of aging. Development implies progression, and leads to some form of stability or maturity. The processes of change are driven by developmental mechanisms, such as genetic mechanisms, experience and learning, or tool-mediated social support

As development is a *process* of change, it is based on a particular form of causality, i.e. *process causality*. It can be intuitively understood as the form of causality that connects every preceding event (moment, state,...) in an object's history with its successive event (Dowe, 2009). According to process metaphysics (Rescher, 1996), processes define objects: my existence as a specific human being is instantiated by the fact that I am a process of myriad connected events that started with my biological conception and that will end with my death. Since development is a process, it must be studied as a process, namely as a sequence of process-causally connected events.

The short-term time perspective of action and experience

Observers can also take a *short-term* perspective on the developmental process, for instance for the duration of minutes or hours. The observed patterns of changes refer to behavior, action or activity. They are processes of changes in the actions that a person performs, changes in his bodily position, changes he brings about in his environment, and so forth. These short-term changes and the corresponding processes of events are reflections of that person's development and developmental history. The things the person is doing and experiencing at this particular moment in his life clearly depend on capabilities and dispositions that are the result of his developmental process. That is to say, every action and associated experience that is occurring is the implicit expression of a particular level of development on any of the characteristic dimensions of development (cognition, social interaction, physical skills, etc.).

On the other hand, the long-term processes of my development have been conditioned by short-term events in that every action and experience contributes to the long-term processes of development. The process-causal relationships between the long-term developmental and the short-term action-experience processes are bidirectional.

One can also take a "middle term" perspective on the ongoing lifespan process, for instance the perspective of several months (note however that these perspective boundaries are extremely fuzzy). By doing so, one will typically see processes that take the form of learning particular skills, or the achievement of long-term goals.

As these perspectives, or timescales, are embedded into one another, one must always ask the question of how their processes are conditionally related to one another.

Processes, variability and recurrence

We have seen that the short-term sequence of actions and experiences form a *time series* of developmental levels, expressed on some developmental ruler (see Van der Steen et al., 2014, & Guevara et al. 2017 for examples).

This time series is implicit in that an observer cannot perceive it directly but can only perceive it if he or she applies a particular developmental ruler to a series of observed events (for instance, a series of problem-solving activities in two cooperating children). Since it is highly likely that not all of a person's actions and experiences reflect the highest possible developmental level at that particular moment, the implicit time series of developmental levels will look pretty jagged, reflecting the variability and fluctuations in the process of interest. This variability is a genuine property of short-term and long-term processes (process; Kello et al., 2010; Van Dijk & Van Geert, 2015) and it should not be reasoned away as measurement error, unless otherwise proven. If variability is a genuine property of the processes that I am studying, we may expect that this variability itself will be subject to short-term and long-term change. The properties of such variability will be able to tell us something about the underlying mechanisms if we have a theory that explains how variability is related to postulated mechanisms.

When I look at the variability that is characteristic of processes, I can decide to perform an operation of averaging, which basically means that I take the temporal

dimension out of it and replace it by some persistent, stable property, which is the average value. However, I can also retain the fundamental property of temporality. I can look at changes in the bandwidth of variability (Van Geert & Van Dijk, 2002). I can also look at variability from the viewpoint of recurrence: given a particular event in my time series, I can look at earlier and later events that are sufficiently similar (Webber & Zbilut, 2005). This similarity can be defined on qualitative grounds, for instance every event that is qualitatively similar to the event one is focusing on, or on quantitative grounds, for instance if one has a quantitative specification based on some sort of developmental ruler or measurement instrument. Recurrence is a way of showing development, or any other process for that matter, as a series of similar and different events over time.

Dynamical systems

Dynamical systems: a definition

Weisstein (2018) defines a dynamical system as a means of describing how one state develops into another state over the course of time. Meiss (2007) defines a dynamical system as a rule for time evolution on a state space. In Weisstein's definition, we immediately ask "the state of what" and "what is a state". A dynamical system describes the sequence of states of some real object or phenomenon. A particular child, for instance, is such an "object" since one can think of developmental, causal or conditional processes occurring in it. A sample of children, collected by a researcher with the aim of doing some sort of developmental study, is not such an object: there are only developmental, causal or conditional processes that apply to the persons in the sample, not to the sample itself. However, a particular school class of children interacting with one another, a teacher and learning materials, is also an example of such an object, since it is subject to processes of change, e.g. in its interaction patterns.

Properties of dynamical systems

In order to define a *state* we need a number of descriptive properties, that is to say a set of properties that are characteristic of the objects of interest. In development such dimensions could be "cognition", "social interaction", "language" and so forth. The cognitive dimension, for instance, can be specified in terms of a developmental ruler that distinguishes levels of cognitive complexity, such as Fischer's scale of dynamic skills (Fischer, 1980). Another dimension could specify the level or form of cooperation with peers. Let us suppose we observe a child trying to solve a set of simple physics problems together with another child. Every event in this process can be characterized in terms of the level of cognitive complexity associated with, and a particular level of social interaction (which could be as simple as "interacting" versus "not interacting"). Together, these two dimensions form a space, and this space defines the possible states we can discern in this particular process of problem-solving by a specific child. This is why we call it the *state space*. A state, let us say at a particular moment t in time is defined simply as the value at time t on these two dimensions. At some later moment in time, for instance $t+1$, the process may have shifted towards another place in the space, or it might have stayed in the same place. The change, which might be a zero change (it stays in the same place), from t to $t+1$ is one step in the time evolution of this particular object (the child). A dynamic system is a way of explaining how the state at time t is transformed into the state at the time $t+1$, and it does so by invoking a specific rule of change, technically called *evolution rule*. This evolution rule is some sort of mechanism or principle that, given the description of any possible state at time t, gives a description of the state at time $t+1$. For instance, given the state at time t, it will generate a state at time t +1, and given the state at time t +1 it will generate the state at time t +2 and so forth (the unit 1 represents a time change of choice). Put differently, the evolution rule will generate a sequence of such states in the form of points in the state space.

Assuming that, in my example, I represent cognitive level by x and social interaction level by y, the typical mathematical expression of the dynamical system is as follows:

$$x_{t+1} = f(x_t)$$

$$y_{t+1} = g(y_t)$$

These mathematical expressions tell us that the next state of a particular property is a particular function f or g of its preceding state.

However, it is likely that at any moment in time a child's cognitive level and the level of collaboration are in some way or another associated. For instance, the level of collaboration may have an influence on how the child is thinking, and thus on the cognitive level expressed in the thinking, and the cognitive level expressed in the thinking may have an effect on collaboration, for instance in the sense of sharing or checking ideas if one of the children is uncertain about it. That is, the dynamical system is a *coupled system*:

$$x_{t+1} = f(x_t, y_t)$$

$$y_{t+1} = g(y_t, x_t)$$

The dynamical system is iterative or recursive, in that the functions describing the transformation apply to any state of the system at any particular time (within the system's time limits):

$$x_{t+1} = f(x_t)$$

$$x_{t+2} = f(x_{t+1})$$

$$x_{t+3} = f(x_{t+2})$$

which forms a trajectory in the state space:

$$x_t \rightarrow x_{t+1} \rightarrow x_{t+2} \rightarrow x_{t+3} \rightarrow \ldots.$$

The evolution functions f, g, etc. are a mathematical expression of mechanisms of change, i.e. of the psychological mechanisms that operate on a particular level of reasoning and a particular level of peer interaction at a particular moment in time, and generate or condition the level of reasoning and interaction at the next moment in time. If the variables x, y, etc. are quantitative variables, the functions f, g, etc. are functions that describe how the values of x and y increase or decrease over time. Mathematically, these functions can be quite simple, even if they represent a complex set of underlying real-time psychological mechanisms.

But however simple they are, they must reflect plausible mechanisms of change. The logistic equation — that my coworkers and I have used in a wide variety of studies — is very simple, but its terms and operators refer to fundamental principles of growth and decay (Van Geert & Steenbeek, 2005).

A dynamic system involves a typical geometrical way of thinking: a system is defined by its state space of characteristic features or properties, and the behavior of the system is its movement in this space. A dimension in a state space is clearly a property along which a system can vary, i.e. a "variable". The "thing" that varies, such as cognitive level, corresponds with a phenomenon that has a certain persistence and relative autonomy in the object under study, and for this reason it can be treated as a component of the system. Given the formal interchangeability of dimensions of a state space and components, system dynamics can be expressed either in the form of a trajectory through a state space or in the form of interactions between components connected in a network. The choice depends on pragmatic considerations. If one studies low dimensional systems, that is to say objects whose organization can be characterized by only a few properties, a dynamical systems approach might be used, in particular if the researcher is interested in typical trajectories of change. If the number of dimensions is high, one can use a network approach (den Hartigh et al., 2016) to study the emergence of exceptional performance. Studies of brain dynamics typically use network models; see for instance Sporns, 2010).

It may be concluded that a particular developmental theory corresponds with a particular dynamical system that formally specifies the theories' properties of interest and the postulated mechanisms of change.

Methodological consequences of the state space conceptualization

Researchers interested in developmental dynamics are increasingly using a state space methodology, state space grids in particular (Hollenstein, 2013). State space grids consist typically (but not necessarily) of categorical dimensions. An adolescent's trajectory can be described in terms of emotional and communicative dimensions. A child's development of syntax can be described in a space consisting of a dimension representing the number of words in a particular sentence, and a dimension representing the presence of particular syntactic constructions in that sentence. The child's syntactic development — represented by these 2 dimensions — is shown by the trajectory in this state space (see Van Dijk and Van Geert, 2011, for visual examples and examples of various other dynamic systems oriented techniques). The trajectory in the state space can be described by measures, such as the dispersion of the states across the state space, and the long-term changes in the dispersion properties. The state space grid method focuses on trajectory properties, but provides no direct access to the evolution rule (i.e. the principle that governs the movement of the system through the state space). Nevertheless, it is possible to represent the system's evolution rule in the form of a matrix of conditional probabilities, which is similar to a Markov model or a transition diagram (e.g., "given state A, there is a probability p that the state moves to state B" for all possible states in the state space).

A typical method for studying dynamical systems is simulation, or modeling. Simulation means that the dynamical system representing a particular developmental theory or model is used to explore the properties such as the trajectories it generates under different values of its parameters. Simulation can also be used to fit dynamic models to empirical data, but the starting point of any model building and simulation is a theoretical or conceptual framework (Abraham, 2014; Van Geert, 1994, 2014; Kunnen, 2017). Recent examples are simulations of dyadic play based on an agent model (Steenbeek, van der Aalsvoort, & Van Geert, 2014), of the emergence of excellent performance based on a network model (den Hartigh, van Dijk, Steenbeek, & van Geert, 2016), of syntactic development (Bassano & van Geert, 2007), of language development in the context of child-directed speech (Van Dijk et al., 2013) and of friendship and behavioral contagion in adolescence (Schuhmacher, Ballato, & van Geert, 2014).

Dynamic systems and real systems: the issue of complexity

Complex systems[2]

The two state space dimensions described above are used as perspectives on an object – a cooperating dyad – that is infinitely more complex than just these dimensions (the reasoning applies of course to any number of dimensions chosen, not just two). The dimensions are chosen because they are supposed to *reflect the complexity* of the processes involved in the two-dimensional state space. By choosing these 2 dimensions as perspectives on the complex underlying reality of the 2 collaborating children, I work under the assumption that whatever is measured by "cognitive level" or "level of interaction" reflects forms of organization, or patterns of recurrence, that are in some relevant ways characteristic of this complex reality. How many dimensions do I need to arrive at a reliable picture? A dynamical system of the brain for instance, could relate the dimensions of the state space to the functional brain units, or to every single neuron in the brain. It is clear that such dynamic systems are intractable because they involve too many dimensions and interactions between them. Even if we could find the "major" dimensions, it is likely that there are still too many of them to study the exact contribution of each of them. This is because these dimensions — or the corresponding components of the system — interact. The dynamics of such systems depends on the properties of the interactions, rather than on the additive contributions of each of the components (this refers to the property of *interaction dominance* as opposed to component dominance (Van Orden, Holden, & Turvey, 2003). However, instead of specifying each and every dimension of the state space, we can focus on the characteristic higher-order properties that such complex, interacting dynamical systems display.

Properties of complex systems

A fundamental property of a complex system is that it leads to spontaneous emergence of properties that cannot be

trivially reduced to properties of the constituent parts or components. What we call cognitive level in the example discussed above is a typical emergent property, arising out of the interactions on the level of neurons in the brain, functional regions in the brain, bodily activities involving movement and perception, and interactions between agents and objects. Emergent properties are the effect of self-organization of the complex system: given the nature of the interactions between the components, the system spontaneously evolves towards self-sustaining structures or properties. In state space terms, the system moves towards one or just a few small regions in the entire state space, which means that the system's behavior now becomes limited to these small regions and to transitions between them. Another term for these small regions is *attractor*: the system is attracted towards these regions and once the system enters such a region, it acts in such a way that it can stay there, despite small external perturbations. Examples are the various interaction states (including working alone) in children working on a physics problem. In adaptive systems, such as children, attractors are typically flexible: they can withstand small perturbations (distractions), but they can also react adaptively to perturbations that matter.

Methods for studying complex systems

In order to study such recurrent patterns, researchers increasingly use recurrence quantification techniques (typical techniques are recurrence quantification analysis or RQA, cross recurrence quantification or CRQA, detrended fluctuation analysis or DFA, or fractal dimension analysis or FDA). These techniques reveal deep properties of the underlying complex systems' organization, such as the level of coordination, flexibility and adaptability of the systems attractor states, or the complexity of the — unknown — state space describing the system's attractors (see Guevara, Cox, van Dijk, & van Geert, 2017, which studies cooperation in a problem-solving task; de Ruiter, den Hartigh, Cox, van Geert, & Kunnen, 2015, on self-esteem processes, or micro-development in parent-child conversations; and Cox, & Van Dijk, 2013). The complexity of micro-development can be studied by means of various statistical techniques (see, among others, De Ruiter, Van Der Steen, Den Hartigh, & Van Geert, 2017). Complexity can also be studied with state space grids, for instance by focusing on transitions between disordered transitions and confined regions of the state space (for example in the co-construction of scientific understanding; Van Vondel, Steenbeek, van Dijk, & Van Geert, 2017).

1. Dynamical systems theory avoids naïve realism: e.g. calling "cognitive level" a component of the system in no way implies that there should be some identifiable physical substance — for instance an isolated collection of neurons — that represents the component "cognitive level". Components are relatively persistent and autonomous patterns of organization rather than physical substances.
2. For further reading I recommend the Scholarpedia articles on Complexity (Sporns, 2007), Complex Systems (Nicolis & Rouvas-Nicolis, 2007) and self-organization (Haken, 2008).

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Dynamic Systems Approach for Studying Human Development

Peter C. M. Molenaar

The Pennsylvania State University, USA
Email: pxm21@psu.edu

Following Klir (1991) a general definition of a dynamic system is: a set of coupled differential of difference equations describing the evolution of this system state, where the system state constitutes the complete formal representation of the system's behavior. According to Klir, a system is not a natural category but instead a convenient epistemological concept. Hence it has to be defined each time the concept is being used. Dynamic systems models come in a wide variety depending on whether time is conceived of as discrete or continuous, whether the system dynamics is perturbed by stochastic noise or not, and whether the dynamic equations describing the system behavior are linear or nonlinear. These types of systems models will be discussed in what follows.

Dynamic systems models basically are models of intra-individual variation. They describe the evolution in time of psychological processes within subjects. It was shown in Molenaar (2004) that to obtain results in quantitative psychology which validly apply at the level of individual subjects one cannot use the standard approach to data analysis based on inter-individual variation (pooling across different subjects). Only if a Gaussian (normally distributed) process is a) homogeneous in time, i.e., stationary (no time-varying mean trend, variance and sequential dependencies) and b) homogeneous across subjects in the population (each subject obeying exactly the same dynamic model) can one validly apply results obtained in analysis of inter-individual variation to the individual level of intra-individual variation. These two criteria are called criteria for ergodicity (Molenaar, 2004). If one or both of these criteria is violated (which almost always is the case, especially with developmental systems which have time-varying parameters) then one should base the analysis on intra-individual variation, comprising subject-specific data analysis (Molenaar & Campbell, 2009). Hence dynamic systems models constitute the basic tool in subject-specific data analysis.

Developmental Systems Theory (DST)

Subject-specific data analysis can be shown to be the method that matches well with important principles of Developmental Systems Theory (DST; cf. Molenaar, 2015). The principles concerned are the following. According to DST development is the result of multiple co-acting influences which are context sensitive and contingent. This implies that development is inherently subject-specific and stochastic (random) because the contexts within which a subject develops have contingent subject-specific effects that continuously build up within the developing system due to ongoing interactions (cf. Gottlieb, 2001). A second important feature of DST is that development is understood as a constructive process in which nonlinear epigenetic influences play important roles (cf. Lickliter & Honeycutt, 2009). A successful class of mathematical-biological models explaining such epigenetic influences are nonlinear reaction-diffusion models. These are nonlinear dynamic models generating emergent qualitative developmental changes that are not caused by genetic or environmental influences but instead are the result of dynamic self-organization (cf. Meinhardt, 1982). Such nonlinear epigenetic influences create substantial subject-specific variation (Molenaar, 2007) which reinforces the subject-specific effects due to contingent contextual influences. A third important feature of DST is its focus on the potential for change evolving at multiple time scales and at multiple levels (e.g., Smith & Thelen, 2003). This feature implies that dynamic systems models inspired by DST will include time-varying parameters located at different levels and changing with different rates.

In sum, DST emphasizes heterogeneity in time (violation of the first criterion for ergodicity) and heterogeneity across subjects (violation of the second criterion for ergodicity). Only subject-specific data analysis can validly accommodate these sources of heterogeneity.

Linear dynamic systems in discrete time

Since its introduction in Molenaar (1985) linear dynamic systems in discrete time have been successfully applied in an increasing number of studies (e.g., Beltz, Beekman, Molenaar, & Buss, 2013; Browne & Nesselroade, 2005; Browne & Zhang, 2007; Ferrer, 2006; Ferrer & Nesselroade, 2003; Gayles & Molenaar, 2013; Hamaker, Dolan, & Molenaar, 2005; Kim, Zhu, Chang, Bentler, & Ernst, 2007; Molenaar, Rovine, & Corneal, 1999; Mumma, 2004; Nesselroade, McArdle, Aggen, & Meyers, 2002; Sbarra & Ferrer, 2006; Shifren, Hooker, Wood, & Nesselroade, 1997; Wood & Brown, 1994). The typical linear dynamic system in discrete time is given by the so-called state-space model:

$$Y(t) = \Lambda\boldsymbol{\eta}(t) + \boldsymbol{\varepsilon}(t); \boldsymbol{\eta}(t+1) = \Phi\boldsymbol{\eta}(t+1) + \boldsymbol{\zeta}(t+1) \quad (1)$$

where $\mathbf{y}(t)$, t=1,2,..., denotes a p-variate observed time series; $\boldsymbol{\eta}(t)$ is a q-variate latent state process; $\boldsymbol{\varepsilon}(t)$ is a p-variate measurement error process; $\boldsymbol{\zeta}(t)$ is q-variate process noise; Λ is a (p, q)-dimensional matrix of regression coefficients (loadings) and Φ is a (q, q)-dimensional matrix of auto-regressive (along the diagonal) and cross-lagged (off-diagonal) coefficients. It is assumed that $\boldsymbol{\varepsilon}(t)$ and $\boldsymbol{\zeta}(t)$ are Gaussian processes lacking any sequential dependencies; moreover the p components of $\boldsymbol{\varepsilon}(t)$ are assumed to be uncorrelated.

The statistical theory underlying the direct fit of this model to observed p-variate time series quantifying intra-individual variation is quite complete. This is in contrast to models considered in the next section. The model specified in (1) applies to stationary observed time series, i.e., series of which the mean function, the variance and the sequential covariances are independent of time. If the parameters in (1) are allowed to vary in time then the following model obtains:

$$\begin{aligned} \mathrm{Y}(\mathrm{t}) &= \Lambda[\boldsymbol{\theta}(\mathrm{t})]\boldsymbol{\eta}(\mathrm{t}) + \boldsymbol{\varepsilon}(\mathrm{t}); \boldsymbol{\eta}(\mathrm{t}+1) \\ &= \Phi[\boldsymbol{\theta}(\mathrm{t})]\boldsymbol{\eta}(\mathrm{t}+1) + \boldsymbol{\zeta}(\mathrm{t}+1); \boldsymbol{\theta}(\mathrm{t}+1) \\ &= \boldsymbol{\theta}(\mathrm{t}) + \boldsymbol{\xi}(\mathrm{t}+1) \end{aligned} \qquad (2)$$

where all free, possibly time-varying parameters are collected in an s-vector $\boldsymbol{\theta}(t)$ which obeys a random walk model (third equation in (2)). The residual process $\boldsymbol{\xi}(t)$ consists of s mutually uncorrelated process noise series which lack any sequential dependency. If the variance of the k-th process noise component $\xi_k(t)$, k=1,2,...,s equals zero then that particular parameter is stationary (time-invariant). For applications of this model to a developmental process, see Molenaar et al., 2009; see also Molenaar, Beltz, Gates, & Wilson, 2016). This linear nonstationary state-space model can track nonlinear dynamic systems quite closely.

Nonlinear dynamic systems in continuous time

Our consideration of dynamic systems in continuous time will be restricted to so-called nonlinear potential systems (cf. Molenaar & Nesselroade, 2015):

$$\mathrm{d}\mathbf{y}(\mathrm{t})/\mathrm{dt} = \partial\Xi[\mathbf{y};\boldsymbol{\theta}]/\partial\mathbf{y} \qquad (3)$$

where $\mathbf{y}(t)$ denotes a vector of behavioral variables, $\Xi[\mathbf{y};\boldsymbol{\theta}]$ denotes a nonlinear potential function, $\boldsymbol{\theta}$ is a vector of parameters called control variables and ∂ stands for the partial derivative. This nonlinear system is capable of undergoing stage transitions (bifurcations) as a function of slowly changing control variables in $\boldsymbol{\theta}$. A theorem by Thom (1975) shows that bifurcations in potential systems are a function of the number of behavioral variables and control variables actively involved in the bifurcation. Figure 1 shows the generic bifurcation if there are a single behavioral and two control variables actively involved in the bifurcation, yielding the cusp catastrophe.

Each bifurcation (stage transition) is accompanied by so-called catastrophe flags, like anomolous variance, sudden jump, divergence and hysteresis (cf. Gilmore, 1981). van der Maas & Molenaar (1992) relate all catastrophe flags to empirical data obtained with children undergoing the stage transition from pre-oprational to concrete operational performance in cognitive development. For instance anomolous variance is associated with oscillations in the responses of transitional subjects as reported in Flavell & Wohlwill (1969). For a review of research concerning catastrophe flags in the detection of stage transitions in the balance scale task, see van der Maas & Raijmakers (2009).

Conclusion

It was shown that dynamic systems approaches to study developmental propcesses are required to obtain valid results at the individual level due to the consequences of ergodic theory. Three key statistical models to carry out subject-specific data analysis were described: the stationary linear state space model in discrete time, its non-stationary variant, and nonlinear potential systems in continuous time. Each of these models has been successfully used in the direct fit to multivariate time series of intraindividual variation in developmental processes.

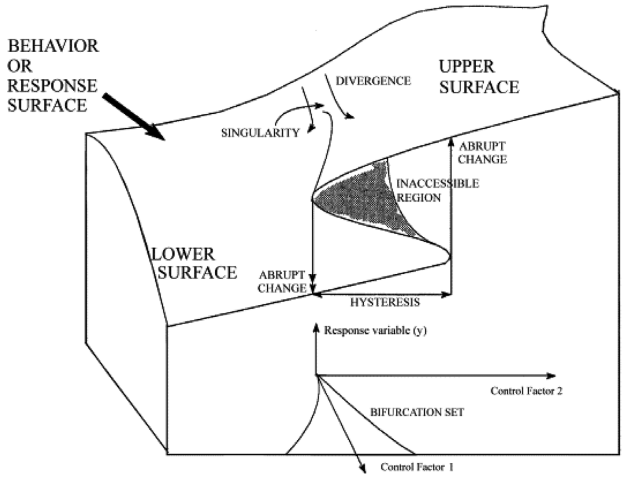

Figure 1. The cusp catastrophe. The behavior surface shows system eqilibria as function of the two control variables. In the hysteresis loop the transition from the lower surface to the upper surface occurs at a different location than the transition from the upper to the lower surface.

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COMMENTARY

Dynamic Systems – A Plea for Ultimately Acknowledging the Individuality and Complexity of Human Functioning

Matthias Reitzle
Friedrich Schiller University of Jena, Germany
Email: matthias.reitzle@uni-jena.de

When thinking of humans and the vastly different developmental pathways they follow towards becoming unique individuals, neither the mechanistic machine metaphor nor any claim of universal laws comes to mind. Numerous writings in the 1970s and later (e.g., Brandtstädter, 1985; Endler & Magnusson, 1976; Levenson & Crumpler, 1996, Overton, 1994; Shotter, 1981, 1983; Wohlwill, 1973) have tried from different angles to convert the mainstream to an organismic, relational, dialectical, person-focused viewpoint as the more appropriate paradigm. However, the developmental community has had a hard time seceding from the unfortunate legacy of behaviorism with its key ingredients of prediction, efficient causality, reduction to a few operative variables and alleged homogenous if not universal functioning of entire aggregates in linear regression analyses. Infancy research may be partly exculpated, because biology-influenced developmental phenomena in the domains of motor development, language, and cognition may be, at least gradually, more universal than, for example, vocational development, identity development, development of personality, development of deviant behavior, development of intimate relationships, and so forth. Still, when one reads the apodictic judgement that "18-month-olds are able to do this or that," this often means that a higher rate in the experimental group performed in the expected way as compared to the control group. The reasons for performance vs. failure in both groups often remain obscured. The developmental dynamics behind this variability are exciting research questions. However, to arrive at sound answers, developmental research must transcend the static nature of the experimental paradigm in infancy, and the questionnaire-based longitudinal survey methodology at later ages with cross-lagged panel models as the prevailing tool of studying human development.

Developmental Systems (DS) presents a, if not *the*, way out of the traditional one-way street. The three contributing authors, Molenaar, van Geert, and Witherington have far more to offer than their necessarily limited sketches in the current Bulletin. They have been major advocates for a dynamic systems perspective on individual-based developmental processes for decades. It is largely thanks to their work that the reasonable idea of viewing human beings as complex organismic systems instead of simple mechanical input-output devices has trickled down to developmental research – albeit at a slow pace. Although the theoretical ideas go back to the first half of the 20th century (see Witherington, this issue), and enjoyed great support by Thelen and Smith (1994; see also Thelen, 1989), Howe and Lewis (2005) complained in a special issue on DS more than a decade later: "Yet most developmentalists continue to use conventional experimental designs and statistics to carry out their research . . . Researchers stick to well-established habits of thinking and working, and their students acquire the same habits, often because that is the easiest road to publication and career advancement (p. 250)." In a similar vein, Lewis (2011) concluded: "Although most developmentalists find the DS approach 'interesting,' even 'fascinating,'" they continue to rely on time-honored methods based on the general linear model (p. 282)." Why is the field so reluctant to apply these logically straightforward and convincing ideas? Neither a controversial debate about DS, nor an explicit argument-bolstered commitment to the mechanistic paradigm, are visible forces impeding the expansion of the DS approach. In my eyes, three major obstacles hamper its advance. First, there is psychologists' deeply rooted adherence to the myth that only aggregate findings based on variable relationships in large samples warrant generalizability and are therefore true science. I would call this the naïve nomothetic stance because the aggregate parameters usually don't unveil to whom they apply, or not (Reitzle, 2013). We, using our analytical tools, don't know the potential variety of different data generating processes behind our SPSS data spreadsheet (cf. Jaccard & Dittus, 1990). Second, studying development as a continuous process from a DS perspective needs more than a conventional panel study consisting of occasional snapshots at largely spaced intervals. Instead, in the quest for the dynamics driving development, highly frequent time series, sometimes even at a daily basis, are needed at the lowest time level. This is a cumbersome endeavor for both researchers and study participants. Third, the standardized statistical tool boxes are not well-equipped for this purpose. There aren't any simple click buttons for running non-stationary multivariate time series models. In addition, these methods are significantly underrepresented in most statistics classes – probably often due to the first obstacle mentioned above. As a consequence, applications often stay in the circles surrounding the propagating methodologists (e.g., Molenaar, Beltz, Gates, & Wilson, 2016; Molenaar, Sinclair, Rovine, Ram, & Corneal, 2009; Wang et al., 2014) or serve illustrative purposes in method journals (e.g., Chow, Zu, Shifren, & Zhang, 2011).

Despite their brief format, the three contributions in this Bulletin address a broader readership and may encourage more scholars in the field to consider these ideas in their theories and empirical research – despite the huge complexity of the DS approach. I will try to simplify this complexity a bit along the three current papers.

Individual processes instead of static group pictures

The authors focus on processes rather than static properties. Processes are characterized by change. Psychologists (in contrast to sociologists, economists, and demoscopic researchers) ought to be interested in change primarily at the person, not so much at the sample or population level. Within the person, change does not occur in isolated variables, but in the entire individual system (holism). Technically speaking, change pertains to q-variate variable vectors. Depending on the research topic, such vectors may contain psychological, physiological, but also context properties in any blend. All possible score patterns of these properties define the state space. Within the state space, patterns (states) are not equally likely, some combinations may be very common, others may be even impossible for a particular person. Again, instead of single properties, states change, and the change in one property cannot be fully understood without considering the change in the other constructs defining the state space.

Prediction by iteration

Van Geert's paper nicely illustrates that (apart from external impact and unspecific innovation), at time t are best predicted by the previous state at time t-1 throughout the entire time series by a certain rule (evolution rule, e.g. the logistic equation). In other words, the system's (intermediate) end state at a particular time becomes the point of departure for the next state. One may get the impression that this iterative sequence places too much emphasis on the "here and now", thereby neglecting developmental history, for example, the effects of early attachment experiences or some other "coining" in infancy. Well, the answer is again rather complex because we have to distinguish between different system or process levels, the processes of real time action and immediate experience and the processes of long-term changes at the developmental time level (and may be even another layer in between, see van Geert). The early experiences may not only be carried forward stepwise by the iterative sequence of the microprocess. As we will see later, they may have condensed at a higher structural level, thereby exerting their influence on real time dynamics. The distinction between these levels is at stake in Witherington's paper when he contrasts Thelen et al.'s "Bloomington approach" from van Geert et al.'s "Groningen approach".

Real time, developmental time, and circular causality

Simply speaking, the "Bloomingtons" want to restrict themselves to the observable real time phenomena and show an aversion against anything resembling metaphysical entities such as unobservable structure, qualitative shifts herein, meaning, end-directedness, etc. For them, developmental change is real time change in another currency at a purely quantitative exchange rate. In contrast, Witherington assigns the developmental system level (diachronic processes) a quality in its own right. This level represents a structure that is, although emerging from day-do-day interactions, not a simple algebraic combination of these. One may describe this structure as an attractor landscape with valleys and funnels indicating very likely patterns of behavior and emotional experiences, and hills and ridges marking spots that occur rarely or not at all in a person's behavioral performance and/or emotional experience. This landscape may represent dispositions, habits, behavioral styles, or even personality as a whole (see Nowak, Vallacher, & Zochowski, 2005). The real time and developmental time system levels are interconnected via circular causality (Witherington, 2011). Everyday experiences and interactions form the attractors (bottom-up) while at the same time the attractor landscape(s) influence the everyday interactions and experiences (top-down). Although bottom-up and top-down effects unfold their results on different time scales, there is no logical distinction in terms of one level representing the cause and the other the effect.

The need to study individual systems (first)

Molenaar's outstanding contribution has been to offer the psychological community an unquestionable, formal, and non-ideological argument to refrain from sample-based analyses in order to explain and understand psychological processes at the individual level: *non-ergodicity* (Molenaar, 2004). A simple illustrative example for ergodicity is that one person rolling a dice 1000 times in sequence yields the same results as 1000 persons rolling a dice simultaneously. In psychology, ergodicity is not very likely. Even the famous "Big Five" found at the aggregate level rarely show at the individual level (Borkenau & Ostendorf, 1998). In his contribution to this special section, Molenaar offers a brief overview over the mathematical formalizations of stationary and non-stationary discrete time models, and continuous time models. This may be an incentive for the applied researcher to refer to Molenaar and Nesselroade (2015) in the new Handbook of Child Psychology and Developmental Science where the overwhelming utility of systems methods for developmental research, their mathematical formalizations, and their applications are outlined in great detail.

As is illustrated by the ergodicity problem, persons differ not only in scores on particular variables at a certain time, but also in their system functioning as a whole. Two persons may go through a similar process, but their processes may occur at different scale levels of the involved variables. They may differ in timing and duration of the process, and in number and kind of variables involved in the process. Even if the same variables are involved, the type of their connection (linear, curvilinear) may differ. And even if the connection was linear for both, the size of covariances may differ. In short, heterogeneity mandating individual analyses as a point of departure can occur in many different guises.

How to make DS methods a routine procedure for applied researchers?

As outlined above, DS methods need extensive time series data. They are only available at the real time process level. Connecting these real time processes to long-term developmental or structural (qualitative) changes with existing empirical data seems to be a future endeavor. However,

modeling micro-processes based on time series data is, in principle, possible in various fashions (see Molenaar) and the logical first step. In summer 2017, an Mplus meeting was held under the heading "From SEM to DSEM (Dynamic Structural Equation Modeling)". I was excited because it looked like DS was knocking at the door of mainstream developmental research given a popular statistics package had implemented dynamic time series modeling in its latest version (Mplus 8). In the respective papers from the Mplus homepage (Asparouhov, Hamaker, and Muthén, 2017; Hamaker, Asparouhov, Brose, Schmiedek, and Muthén, in press), I found some impressive examples of addressing the heterogeneity issue via multilevel modeling by treating means across time, lagged regression parameters, and innovations (residuals) as random parameters indicating individual differences in functioning. However, these examples represented stationary processes only. For developmentalists, non-stationarity seems equally important. Dealing with human organisms who learn, integrate new experiences, adopt to circumstances, become tougher or more sensitive, stationarity of processes hardly occurs. Comparing the end of the first passionate love with the fifth divorce, the connection between loss and grief may differ, at least for some. Except for the examples mentioned above, I have not found many examples of non-stationary process modeling. Given the lack of theories informing on potential effect changes in any micro-level processes, it is an epistemological necessity to run such models in an explorative fashion as was done in these few examples. In this enterprise, DS offers a promising framework with matching statistical tools for more appropriate theory building and empirical research in the developmental domain.

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Report on the 12th ISSBD African Regional Workshop Held at the Jophus Anamuah-Mensah Conference Centre (JAMCC) of the University of Education, Winneba – Ghana

Rev. Kwesi Nkum Wilson (Ph.D.) - (Chair), Mrs. Christina Ammah (Chief Coordinator) and Mrs. Patricia Amos (Secretary)

University of Education, Winneba – Ghana

Introduction

The Faculty of Educational Studies, University of Education, Winneba (UEW), in collaboration with the International Society for the Study of Behavioural Development (ISSBD), held its 12th ISSBD African Regional workshop. The three-day workshop took place at the Jophus Anamuah-Mensah Auditorium from Monday 30th October, 2017 to Wednesday 1st November, 2017. The theme for the workshop was "Researching into Adaptive Behaviours in Contexts of Change: Interdisciplinary and Multicultural Approaches for Early Career Scholars in Africa".

Participants

Out of a total of 110 early career research scholar applicants, 27 qualified for travel grants (including boarding and lodging) for the workshop. They were from Cameroon, Ethiopia, Kenya, Nigeria, South Africa, Uganda, Zambia, and Zimbabwe. The Jacobs Foundation also sponsored five early career scholars from the Ivory Coast to participate. Twenty-eight early career scholars from Ghana were also invited to participate, making a total of 58 early career scholars who participated in the workshop.

Resource Persons and Facilitators

Seven resource persons were invited to lead the workshop. These were: Prof. Anne Cheryl Petersen (*University of Michigan, USA),* Prof. Robert Serpell (*University of Zambia, Zambia),* Prof. Ama De-Graft Aikins (*University of Ghana, Legon*), Prof. Esther Akinsola (*University of Lagos, Nigeria*), Prof. Julie Robinson (*Flinders University, Australia),* Prof. Nsamenang Augustine Bame (*Cameroon*), and Prof. Charity Akotia (*University of Ghana, Legon*)

There were nine facilitators, all from the University of Education, Winneba who assisted in facilitating the workshop. These were; Prof. Jonathan Ammah, Dr. Samuel Kweku Hayford, Dr. Nyadu Yaw Offei, Mrs. Christina Ammah, Dr. Stephen Antwi-Danso, Rev. Kwesi Nkum Wilson (PhD), Mrs. Patricia Amos, Ms. Sharon Bannerman and Mr. Collins Awuku.

Opening Ceremony

The workshop was opened with a colourful ceremony at the Jophus Anamuah-Mensah Conference Centre. In attendance were the Very Rev. Fr. (Prof.) Anthony Afful-Broni the Pro-Vice Chancellor, who doubled as the Ag. Vice-Chancellor; Deans of Faculties; and students from the University. Foreign participants were welcomed to the Conference Centre with cultural display by students of the Theatre Arts Department. The workshop was opened with a welcoming address by Rev. Kwesi Nkum Wilson (PhD), who is the Local Organising Committee (LOC) chairman. He gave a brief history of Ghana's participation in ISSBD workshops and encouraged other Ghanaians to join the ISSBD. He also welcomed participants and resource persons and encouraged them to make the best of their stay in Ghana.

The HFC Bank, and the NAATOA Microfinance Services Ltd-Mankessim were acknowledged for their support for the workshop.

The chairperson, Professor Charity Sylvia Akotia, in her closing remarks, highlighted that participants should adhere to current models in studying maladaptive behaviors and stressed the need for early career scholars to study locally and strive to engage in collaborations to broaden their scope of knowledge. Additionally, she emphasized that great opportunities exist for young scholars to help the African continent.

The opening ceremony came to a close with a group photograph including the Acting Vice Chancellor of UEW and the professors and participants.

Workshop

The following topics were treated by the resource persons during the sessions

- Grant/Proposal writing, by *Prof. Ama deGraft Aikins*
- Researching into adaptive behaviours, by *Prof. Anne Petersen*

- Interdisciplinary approach in research for early career scholars in Africa, by *Prof. Robert Serpell*
- How to publish in international journals, by *Prof. Julie Robinson*
- How to make an academic paper presentation, by *Prof. Esther Akinsola*
- Multicultural approaches in research for early career scholars in Africa, *by Prof. Robert Serpell*
- Effective presentation of conference posters, *by Prof. Julie Robinson*
- Way forward for ISSBD African chapter by *Prof. Bame Nsamenang*

Innovations

There was a little change during this workshop, as some early career scholars were given the opportunity to make oral presentations of their research. In all, 24 participants presented their research. They were placed in three groups, with a facilitator attached to each group.

The Poster Sessions were also held on the 2nd day of the workshop. The workshop was closed by Professor Francis Owusu-Mensah, head of the Institute for Distance and e-Learning, who represented the Pro-VC, and thanked the organizers of the workshop. He encouraged the participants to be good ambassadors for the Society. There were a dinner dance and cultural presentations to close the workshop.

Excursion

Participants and resource persons visited the Historical UNESCO Heritage site, the Cape Coast Castle which has been in existence for over 300 years. The resource persons and a few of the participants continued their excursion to the Kakum National Conservation Park for a Canopy Walk experience.

Recommendations

The LOC had a short evaluation meeting with the Resource persons (Prof. Anne Pertersen, Prof. Serpell, Prof. Julie Robinson, Prof. Esther Akinsola and Prof. Bame Nsamenang) at their hotel. Generally, they commended the LOC for very good work done.

These were the recommendations:

- Among resource persons, there should be more Ghanaians than other senior scholars from other countries
- It will be more appropriate in subsequent workshops to be stricter with change of tickets with resource persons and participants, and also with their presentations
- More organization should be done with regards to the attrition rate of participants, especially in the poster presentation whereby some of the participants did not turn up but did have their abstracts published.
- There should be careful planning and mentoring of organizers in choosing topics for the various

presentations so there will be no overlap of presentations of similar views.

- Ticketing issues with regard to names arrangement should be taken into consideration to avoid immigration issues with LOC.
- All technical infrastructure should be properly organized. Especially, the video aspect of presentations should be considered and the various tools acquired.
- Networking should be initiated using Facebook or WhatsApp and uploading the presentations and posters for participants.

Appreciation

The University of Education, and the Winneba Local organizing committee, wish to acknowledge the International Society for the Study of Behavioural Development, the Jacobs Foundation, The HFC Bank, and the NAATOA Microfinance Services Ltd for their generous financial assistance and support for the 2nd ISSBD African Workshop. We also wish to thank the resource persons, facilitators and event assistants for their invaluable contribution towards the success of the workshop.

25th ISSBD Biennial Meeting Update

Melanie Zimmer-Gembeck and Bonnie Barber

ISSBD 2018 Conference Organizers
School of Applied Psychology,
Griffith University,
Southport, Australia

The ISSBD Biennial Meeting is an occasion for ISSBD members, and those interested in behavioral development from around the world, to meet, network and collaborate with other researchers of human development. The aim is to foster research, education and scholarly collaboration. Delegates are given the opportunity to present their own research on behavioral development, while also learning more about human development research in the areas of developmental science, health, education, psychology, sociology and related fields.

ISSBD will be hosting the 25th Biennial Meeting on the Gold Coast, Queensland, Australia July 15-19, 2018, including preconference workshops.

The conference will be held at The Star (https://www.star.com.au/goldcoast/) in Broadbeach, Gold Coast, Queensland. The conference program is now available on the conference website (www.issbd2018.org) and includes more than 900 presenters from almost 70 countries. Highlights are five Keynote Addresses from leading scholars in the areas of education and social context (Prof Jacquelynne Eccles, USA); anxiety disorders and application of theory to practice (Prof Ron Rapee, Australia); translational research and human rights in Latin America (Prof Silvia Koller, Brazil), positive youth development and social justice (Prof Richard Lerner, USA), and youth crime and peers (Prof Wayne Osgood, USA). There are also 5 invited addresses from other distinguished colleagues on topics of parenting, violent extremism, economic disparities, immigrant and refugee youth, and research-practice partnerships. This does not even include the more than 100 other invited and submitted symposia!

ISSBD 2018 is committed to early career scholars networking and opportunities, also. There will be a series of events specifically for early career scholars, on topics from publishing to statistics. The preconference events on the first day (15th July) are also designed specifically for early career scholars.

The Broadbeach area of the Gold Coast is right on the Pacific Ocean, close by some of the best surf in the world, great restaurants, rainforest hiking, and visiting the native koalas, wallabies and kangaroos - in nature parks or in the wild. In addition to the conference venue, The Star, affordable hotels in the area are numerous, including backpackers (Surfers Paradise Backpackers Resort) and apartment hotels (Meriton Suites Broadbeach, Meriton Suites Southport). All are within easy walking distance to The Star or via the new G: link light rail system (http://ridetheg.com.au/).

Finally, don't forget to register for the Gala Dinner and Dance to be held at The Star on Wednesday 17 July 2018. As you might expect to find in Australia, the home of AC/DC and classic pubs and clubs in every city and town, we have a classic rock band booked to make this a great time to relax and celebrate with old and new friends after a day of research and networking.

Key sponsors of ISSBD 2018 are Gold Coast Tourism, Tourism and Events Queensland, Griffith University, and Queensland Health. We thank them for their enormous support.

Academic Homage to Professor Augustine Bame Nsamenang

By Emeritus Professor Therese Mungah Shalo Tchombe
Director Centre for Research in Child and Family Development & Education Limbe, Cameroon

The Minister of Higher Education
The Pro-Chancellor, University of Bamenda
The Vice-Chancellor, University of Bamenda
Dear Members of the Nsamenang's Family
Dignitaries
The President Elect of the Cameroon Psychological Association
Colleagues and Students

Today, we are deeply troubled and shaken by the reality of the passing on, of Professor Augustine Bame Nsamenang, a renowned Professor of psychology and counseling, a colossus of Africentric epistemology and developmental psychology, a man who demonstrated resiliency and more importantly, supported resilience in others. Professor Nsamenang, the fourth out of five children, was born on the 23rd of August 1951 to the late Pa Bame Joseph and Ma Adela Shwemyar in Kitiwum, Nso in Northwest Region of Cameroon. He got married at the age of 31 to Yeh Bridget Tar, now a retired Social Worker of the Cameroon Civil Service, on 15th April 1982 after obtaining his Master's degree in Guidance and Counseling. He continued his education while establishing a family. They were blessed with five beautiful children he adored: Kila Diyla (Physician Assistant), Agatha Sheri (Clinical Psychologist), Vitavi (Computer Engineer), Rita Sanyuy (4th year Medical Student in UBa) and Yurinyuy (Computer Engineer, HTTTC, UBa). He was also blessed with three grandchildren (Delanie, Katelynne, and Nolan). He retired on 23rd August 2016 and on died 14th February 2018.

The Paradox in Mourning and Celebrating

Yes, we are in deep mourning but as we mourn, permit me to share some reflections and views to remind ourselves of who Professor Augustine Bame Nsamenang was to all of us, his family and the world at large. In this painful moment of the realization of his transition which we consider untimely, let us also create some space to celebrate his great and countless achievements in academia, research, administration, and services he offered various communities, nationally and internationally, and the overall contributions he made in higher education in Cameroon and abroad. Bame, as we fondly called him, was unique in his persistent and consistent pursuit of the integration of a culturally appropriate and contextually sensitive knowledge system in education and development policy, research and practice, a course which earned him great admiration from the international community, evident in their reactions to his passing on.

International Reactions to the Announcement of his Demise

Professor Saths Cooper, President of the International Union of Psychological Science (IUPsyS) and President of Pan-African Psychology Union (PAPU) says this of the passing on of his Vice President and President-Elect Bame, "This is a great loss to psychology in our continent and the world."

Professor Zelma Mokobane from South Africa said, "An African Giant has fallen. He will always be remembered."

Professor Elias Mpofu from Australia added as he wrote to Professor Phasha of Pretoria, "What a loss to the profession and to humanity. He has been quite inspirational."

Professor Ziphora from South Africa said, "I lack words to express my shock to this sad news. Some people come into one's life once but their shadows leave a trail of footprints never to be erased from one's memory; that was Prof. Bame as you introduced me to him."

Professor Anne Petersen, Former President of the International Society for the Study of Behavioural Development (ISSBD) wrote: "Human Development scholarship has just suffered an enormous loss with the death of Bame Nsamenang. He has been a leader in African human development research, bringing cultural knowledge to all of us about African Human Development, and bringing basic knowledge of human development theories and concepts to Africans. His books and writings are classic. We must do something to remember him at ISSBD 2018." Of course, the decision has already been taken. The memorial session in your honor, "Bame" will be on Tuesday July 17, 2018 from 6:30 to 7:30 pm during the 2018 ISSBD Biennial Meeting in Gold Coast, Australia. I am sure "You" will be present.

Alan Pence of Early Childhood Development and Virtual University (ECDVU) exclaimed, "I am stunned. I have had nothing but admiration for Bame since I first read his book *'Human Development in Context'* shortly after its release in 1992. His friend and mine, Michael Lamb, introduced us to each other's writings back in the 1980s, and we became fast friends and 'co-conspirators' to have African voices be heard in child development and ECD globally. Bame was "truly one of a kind—an inspired thinker, a fierce and unflagging advocate, a man who knew his roots." He

continued: "Bame was one of the bravest academics I have ever known. His ability to speak Truth to Power was unexcelled! I can hardly take in this news—it stuns my heart and my soul. For all of us who knew him, we are honored and all the better and stronger for his having passed our way. Rest in peace brave and inspired soul!"

Professor Robert Serpell (University of Zambia) was with Bame at the recent ISSBD Africa Regional workshop in Winneba, Ghana in November 2017 and both continued together to a great conference held by Aga Khan University in Dar es Salaam, Tanzania. Professor Serpell's comments are resounding: "His voice and presence were an inspiration at both meetings to many upcoming African developmental scholars (see tributes). And his writings, including the co-edited Handbook and the Africentric Perspective book will continue to spur generations to come to continue the movement of which he has been a leader, affirming the importance of African cultures for understanding and supporting human development in Africa and elsewhere in the Majority World. He concluded by saying "Your words will continue to fire up critical scholarship!"

Professor Nsamenang: A Celebrated African Academic Giant

Bame attended Sacred Heart Primary School, Kitiwum (1957-1964) Nso, North West, Cameroon. At an early age like most Cameroonian children, he faced enormous challenges, yet developed resilient skills and ingenuity to forge on against all odds. For secondary education at both first and second cycles, he attended Saint Augustine's College Kumbo, Nso, Cameroon. Here, he demonstrated great leadership qualities filled with creativity, imagination and endurance. After his secondary education, he proceeded to the National School of Nursing and Midwifery, Bamenda (1970- 1973) where he obtained a State Diploma in Nursing. He then moved on to Nigeria in 1976, where he pursued his tertiary education in the prestigious University of Ibadan in Nursing. In 1979, he obtained an Honours Bachelor of Science degree in Nursing at the University of Ibadan, Nigeria. He continued and obtained a Master of Education degree in Guidance and Counseling in 1980, and later the Doctor of Philosophy degree in Clinical Child Psychology in 1984. Entering Psychology with a nursing background was very strategic and a great asset that became the backbone of his future research in developmental psychology.

After his doctoral studies, from 1987 to 1990, he was a Fogarty Fellow at National Institute of Child Health and Human Development, Bethesda, MD, USA for an Advanced Training in Developmental Research. During these three very fruitful years, working in Professor Michael Lamb's laboratory, he socialized and established strong links and created networks with top developmental and cross-cultural psychologists who accompanied him all through the rest of his academic and professional life. By the time he left the NIH, his famous 1992 book, *Human development in cultural context: A Third World perspective,* was completed with great promise because of his theory of Social Ontogenesis which is widely cited in developmental science across the globe including its eco-cultural message. In 2002-2003, he was a resident scholar (Psychology) at Stanford University Center for Advanced Study of Behavioral Development (CASBS).

The Crossing of Our Paths and the Start of an Academic Journey Together

As you can see from the above, Bame was well connected very early to global scientific and professional networks. But he also needed to establish a home-based psychology niche to achieve his vision and I believe, his mission. I was introduced to that mission by accident. In 1992, Bame was the convener for the International Society for The Study of Behavioural Development (ISSBD)'s first international conference held in Yaoundé, Cameroon and on the African soil. This was the occasion of my first encounter with Bame as he searched for developmental psychologists in Yaounde. He stumbled on Dr. Yinka Njikam, who told him about me. Of course, he came to the Higher Teacher Training College (ENS) Yaounde and found me. Speaking in his usual manner, as I came to understand, he said, "did you not see the announcement pasted up for this conference?" I retorted by asking him if I had to. He was with Professor Serpell and some of the other international scholars, so I tried to be civil and responsible. Then he said to me "please prepare something for tomorrow" which was a Tuesday. I asked, "for such a big conference?" I saw his frustration over a non-response from his own home community to such a big conference. I saw his effort in trying to make something happen, not necessarily for himself. So I agreed. I then went on to see what I could prepare for the next day. He had many big international developmental scholars from Europe, America and Africa. The next day at 2 pm, feeling the challenge for me was enormous, I said to him but why? Very persuasive, he said just go on. At the same time, I wondered if my academic strength in developmental psychology was being put to the test. That notwithstanding, I made a presentation on "Human Development and Pedagogy." It went down well. As if that was not enough he then said to me "can you organize dinner in your house for them?" I asked him, on whose account? However, I did and that too was a great success. Note that Bame and I were meeting for the first time. So you can begin to imagine the nature and characteristics of our academic journey. During this first encounter with him, I observed his capacity not only to make things happen but also his determination to change the Eurocentric perception of human development in Africa. His desire to achieve this great academic plan and zeal to engage others was enormous. My presentation illustrated that we were on the same page. Little did I know that I would be roped into his big plans and we would become partners in this journey for two and a half decades, agreeing and disagreeing, quarreling and making it up on many issues, yet influencing and being influenced by each other in a mutually reciprocal manner.

Without hesitation, I became a member of ISSBD. We journeyed together to all the international conferences making scientific presentations in our areas of interest. As Dean of the Faculty of Education at the University of Buea, I invited him to journey with me so together we could closely nurture the pioneering PhD Students of Educational Psychology (EPY). We gave this group in particular the best visibility with our international contacts, getting ISSBD to sponsor them to conferences and workshops, where their projects were presented and evaluated. We connected them to individual professors for mentorship. Our international scholars highly appreciated that their studies attained

international standards. Our postgraduate students and staff are still benefitting from Bame's contacts. This was also the case with the International Association for Cross Psychology (IACCP). We created another network with this group that benefitted our students through access to funded conference participations, presentations and publications. In hosting the Biennial Conference of IACCP in Buea for which I was the Convener and him as with Bame as co-convener in August 2009, we agreed that the outcomes would be published under our control and I was able to source for funding from IDRC. We insisted on contributions that were Africentric, with the publication to be done in Cameroon with good international editing by reputable African scholars. This was a great success! As you can see, we both enjoyed this relationship, which was observed and appreciated by our international colleagues and students. He passed away so unceremoniously with no signal, engaged until the last in consultations, and handing over notes the same way as he engaged me in his plans in 1992. It's been difficult to believe, as we were together from the 3rd to the 6th of February 2018 and held lengthy discussions; I did not foresee him leaving this earth so soon. During these last moments we shared, he urged that I collect the letter signed by the VC of UBa for the Cameroon-Brazil research project.

Bame, I dropped the letter and gave you the mesage from the Secretary. Did you call her as promised? What did you agree on as the way forward? I have not had the courage to call her. I am sure they do not know you have left for good. They will find out somehow; perhaps Professor Josafa will tell them. I will not do that for you this time!

Professional Growth, Activities and Services Offered

Prior to his university studies in Nigeria, Professor Nsamenang served in 1969 as a Catholic School teacher at Saint Augustine's College, Nso, Cameroon; as a career nurse (Nurse Practitioner) from 1973-1976 at the Provincial Hospital, Bamenda, Cameroon. Upon his return from Nigeria in 1984, he served as Nurse Tutor in Psychiatric Nursing at the National School for Senior Health Personnel, Bamenda from 1984 to 1987.

He grew steadily in his university teaching and research career. From 1985 to 1993 he worked as *Chargé de Recherche* at the Institute of Human Sciences, Yaoundé, Cameroon; Institute of Human Sciences, Bamenda, Cameroon; and the Ministry of Higher Education and Scientific Research, Yaoundé, Cameroon. He was recruited as Assistant Lecturer (Psychology) in 1993 at the University of Yaoundé 1, Bambili Campus, promoted to the rank of Lecturer in 1998, and Associate Professor in 2004. In 2011, he was promoted to the rank of full Professor of Psychology and Counselling.

In 2004 he was co-acting Director Delegate, ENSAB with Professor Ghanfogbe as two-man transition team that administered ENS Annex Bambili after the untimely death of Prof. Victor Mbong Amazee until the appointment of a Director. In 2011, he was appointed Head of Division for University Cooperation in The University of Bamenda, and pioneer Head of Department of Guidance and Counselling in HTTC Bambili. His demonstration of effective administrative and management skills and innovations earned him the appointment as the Director of the Higher Teacher Training College, HTTC Bambili of the University of Bamenda where he galvanized all efforts towards the improvement of teacher education in Cameroon before his retirement in June 2017. In actual fact, Prof. Nsamenang served as a seasoned administrator with immeasurable dedication, enthusiasm and success.

It is noteworthy that Professor Nsamenang, also operated a service facility in Bamenda as the founding Director of the Human Development Resource Centre (HDRC), where he made giant strides in establishing community counselling, development, research and publication. The Centre (www.thehdrc.org) hosts an Africentric international initiative for research and publishing of literature and educative tools that are sensitive to African child development and teacher education.

Professor Nsamenang's contributions as a classroom teacher at the university level have been invaluable to his students in both the national and international arenas, which benefitted from his experience and proficiency. At the national level, he served as Professor of Psychology & Counselling in The University of Bamenda; visiting Professor to the Faculties of Education and Health Sciences in the University of Buea; Professor at the Department of Sciences of Education, E.N.S. Yaoundé and the Bamenda University of Science and Technology (BUST). In BUST Bame went beyond teaching to the extent of mortgaging his house to raise funds for the construction of that institution. For those of you who knew him, when Bame believes in something there is no limit to how far he can go. He was also a lecturer of human development in the School for Senior Health Personnel in Bamenda, Cameroon.

Bame did so many things in so many places in his professional life. Ultimately, in ; September 2015, he was norminated the President-Elect for Pan African Psychology Union (PAPU), Durban, South Africa. In March 2014 he was appointed PhD examiner to the Applied Developmental Psychology Programme of the Addis Ababa University, Ethiopia. Furthermore, in February 2014 he was appointed a Visiting Professor of Early Years Care & Education for the Aga Khan University Institute of Educational Development, Dar es Salam, Tanzania. In July 2012, he was in the team of founding members of the Pan-African Psychology Union in Cape Town, South Africa. From October 27 to November 24, 2011, he was a Resident Scholar at the Rockefeller Foundation Bellagio Center (to complete a developmental science textbook manuscript). From August to November 2010, he was EU Visiting Scholar in the Erasmus Mundus International Master in Early Childhood Education and Care (IMEC) program, Oslo University College, Norway. In 2009 till his passing on he was an Adjunct Professor of Early Childhood Care and Education, University of Victoria, Canada.

Awards

In March, 2008, he was also an Inaugural International Fellow, Society for Research on Adolescence [SRA] in recognition of his "accomplished record of outstanding theory, research, and service among African children and youth".

In May 2007 he became a Paul Harris Fellow "in appreciation of tangible and significant assistance given for the furtherance of better understanding and friendly relations among peoples of the world."

The Researcher

Prof. Nsamenang's contribution to Higher Education transcend teaching and administration and embraces research. He WAS arguably one of the best psychology researchers in Africa and beyond. His research focused on human development in a lifespan perspective, with special attention to Africa's knowledge system and next generations–children and youth. Thus, his primary research was on early childhood and adolescent development. Bame was one of the prominent leaders who championed an indigenous African psychology and was also an advocate for a culturally appropriate and contextually sensitive knowledge base that was consistent with the African Union's vision of an "integrated, peaceful, prosperous Africa, driven by its own people to take its rightful place in the global community and the knowledge economy."

Professor Nsamenang's theoretical position anchors on interactive contextualism and biological embedding, as the foundational determinants of human development, health, and social competencies. Bame's lifetime commitment was to contribute to international psychological scholarship. In pursuit of these purposes, Bame was engaged in extensive local, national and international scientific as well as civil society networks. He is arguably one of Africa's most visible scholars in developmental science and a well published, influential and prolific academic writer (see website). Bame's scientific networking extended to academic mentoring of graduate academic work, as he guided graduate research / internships and sat on thesis defense panels across his national borders.

Scientific Contributions

The most outstanding features of Bame's distinguished academic contributions are classified in three groups:

(1) An Africentric theorization of human development in his Social Ontogenetic Theory, grounded in primary local research, enriched by reflection on personal experience, critical reading of contemporary Western psychology and wide-ranging review of African culture, philosophy, history and politics;
(2) A critical engagement with policy proposals and practices by applied social scientists, policymakers and educators regarding appropriate ways of designing ECDCE services in Africa; and
(3) A sustained and productive commitment to nurturing African scholarship on child development and education.

Websites: 1. www.thehdrc.org,
2. http://www.unige.ch/fapse/SSE/teachers/dasen/Nsamenang.htm
3. http://pipl.com/directory/people/Bame/Nsamenang

Research and Intervention Grants

Over the years, Prof. Nsamenang was awarded multiple research grants to support his research objectives and priorities. In 2009-2010, he was awarded a Jacobs Foundation Grant (100,000 Euros) to develop and publish *African Educational Theories and Practices: A Generative Curriculum Handbook* (Nsamenang, A.B & Tchombe, T.M. Eds.). In 2010-2014 he received an IDRC Grant (5000USD) to publish *Cross-Cultural Psychology-An Africentric Perspective* (Tchombe , TMS, Nsamenang, A.B Keller Hedei & Fulop Marta, Eds). Professor Marta Fulop, co-editor of our Africentric Book says "I have not known him personally, but I know his work and had been working with him on our joint book, so I feel very sorry." She continued: "He is a great loss for Cameroonian psychology and for psychology in Africa and for psychology in the world. My sympathy to his family."

Publications and Conferences

Prof. Nsamenang's reputation as a seasoned researcher is self-evident from the vast list of publications bearing his name. A compressed list of his publications includes 11 books/monographs/briefs; 6 editorial works; 35 book chapters/encyclopedia entries; 40 publications in refereed Journals/newsletters; and a greater number of publications overall than was humanly possible to assemble for the purposes of this discourse.

His huge appetite for intellectual publication was directly proportionate to his high capacity for academic presentations in conferences/seminars/workshops. In order to foster and promote Africentric perspectives in developmental science, Prof. Nsamenang left no stone unturned in six continents of the world as he braved continental boundaries to present his research papers and act as resource person. From 1981 to 2010, Prof. Nsamenang traversed the countries of Africa, Europe, North America, South America, the Middle East, Asia and Australia and presented papers in not less than 70 conferences the world over. This makes an average rate of at least 2 conferences per year in which he actively participated as a resource person. This number can rise into the hundreds if we consider the period between 2011 and 2018.

Besides attending conferences and workshops, Prof Nsamenang was a convener and co-convener of a multitude of workshops, including the Africa Regional International Conference of the IACCP (International Association of Cross-Cultural Psychology), University of Buea, Cameroon, August 1-6, 2009; the Symposium "Adolescents' Worlds: Sharing Lessons from Addressing Dazzling Global Changes in Adolescent Lives in Different Contexts of the Globe"; Biennial Meetings of the ISSBD, Melbourne, Australia, July 2006; the 6th ISSBD International Africa Regional Workshop on HIV/AIDS, Yaounde, 2006; African Youth: Theory, Research and Practice with Youth in Peer Education, Families and Communities, Yaoundé, July 25-31, 2004; the Symposia: Social Cognition and The Socialization of Responsibility in Lifespan Perspective at the VII Biennial Meetings of ISSBD, Ottawa, Canada; and Local Organizing Committee Member, ISSBD Pioneer Workshop for Africa on "Child development and national development in Africa," Yaounde, Cameroon, April 1992.

Consultancies

Professor Nsamenang made invaluable contributions to UNICEF, UNESCO, WHO ERNWACA/ROCARE, and the World Bank ECD as a consultant and in commissioned works, on both national and global platforms. In addition, his expert input enhanced the proficiency of FBOs (faith-based organizations), CBO/CSOs (community-based and civil society organizations) and some local and international NGOs particularly in the arenas of lay counsellor training and HIV/AIDS work with youth. The exhaustive list of his consultative works performed for multinational organizations can be found on his website.

National and International Affiliations and Responsibilities

Cognizant of his role as teacher, researcher and community developer, Prof. Nsamenang did not fail to affiliate himself with both national and international bodies to enable him to accomplish his mission. By 2010, he was already an active member of not less than 20 organizations at both national and international levels.

Furthermore, in 2012, Prof. Nsamenang became the co-founder and pioneer President of the Cameroon Psychological Association (CPA), an organization created for the promotion and application of psychological knowledge and tools for advancement of the science, human welfare and the public good. Bame! In creating this association, you ensured that we made it a member of the Pan African Psychological Union (PAPU) which we attended in Durban in 2016, establishing a landmark for Psychology in Cameroon. Through your networking force, you also ensured that CPA became a member of the International Union of Psychology, another landmark for psychology in your beloved country, Cameroon.

Bame's membership and affiliations at the international scene are enormous. Worthy of note include, Peer Review Role, Membership of Scientific Bodies, Member of editorial boards, and Consulting Editor.

Capacity Building and Service to the Community

With Prof. Nsamenang's commitment to teaching and research in both local and international realms, one could be tempted to think he neglected his service to the community. Paradoxically, he dedicated as much time to capacity building and service to the community as he did to teaching and research. This is evident in multiple social groups and community development projects he engaged himself into. Along with his family commitments, he was also the President of Rotary Club, Bamenda, June 2015 to June 2016, and the President-General of the Kinsaan Development Union (KIDU), Kitiwum village cultural and development forum from 2001 till his departure.

Professor Augustine Bame Nsamenang, the Family Man and A Social Being

Bame's life was not only about work! Even though he worked intensely, he had his fun side. As a simple, religious and an unassuming person, he relaxed well with younger colleagues. He enjoyed spending weekends with friends, sharing some drinks and jokes and conversing in a relaxed mood. He was truly a family man who loved his family and bestowed generous attention on both nuclear and extended family members. He was concerned about his four girls and a boy whom he ensured were well brought up and cared for in boundless ways. He was an endearing father to all. I saw Bame's daring attitude when in one of his fellowship programs he took his girls at a very young age to America to open up their horizons and change the paradigm about girls and education. Bame transformed his "baby sitter" to a category "A" worker in the Cameroon public services and did this for many others. Therefore, as he enlarged understanding of cultural experiences in shaping the psychological growth of children, his attribution system impacted his socialization practices. This to a great extent shaped the development of his children and others who crossed his path. Bame was a family man and a real social being who understood the realities of life and coped with the dynamics of its challenges.

However, Bame also had his downsides as a person. He was highly emotional and temperamental, and in many cases allowed passion to override his reason, a characteristic I must confess landed him in problems with many people, either at home, at work, or in social gatherings. Whenever he demonstrated this around me and I put him on notice, he felt sorry; so I came to know he never really knew when he was hurting others.

So I asked you all, members of his academic, biological and social family communities to pardon him if he did hurt you and you too who may have hurt him, to engage in self-reflection.

My Concluding Thoughts

Professor Bame Nsamenang, may be dead physically, but his intellectual legacy is eternal. If you go through his life plan, it was well strategized; there was a three-year gap in most cases where he worked to raise money for the next leg of his journey. He was shrewd, prudent and wise starting very early. So his life is a testimony of a scholar who never permitted political ideologies and a quest for power to derail him from his professional calling to service as a teacher, researcher and community developer. He has set an example for the rest of us to follow, namely: teach your students well, conduct research and publish, reach out to your community. Bame achieved against all odds. His achievements which we must celebrate are the many connections he has created through his teaching, his numerous unique publications in peer reviewed journals and books that have enlarged the field of appreciation for the uniqueness of the African experience. Let me refer here to Professor Heidi Keller's view. "Professor Bame was an eminent scholar who has contributed enormously to a view of children's development, that is deeply ingrained in culture. I learned a lot from him that influenced my thinking about children's development substantially."

Bame, I want to say your life and its story have been shaped by life circumstances. From our many conversations, I say you are a miracle. I believed as I observed that you lived the gospel of sufferings in your life journey but

because of your deep faith and non-competing spirit, God guided you. For me, your personal immortalization therefore is based on the quality of your life which merits remembrance even by your descendants. Your reputation will continue because of who you were and what you offered.

At this juncture, I join the entire academic and research community to wish you the greatest honors as you rest in peace. We are letting you go, knowing you have transformed us to empower others, being that model of strength, humility, trust, courage, patience, empathy, risk, openness, endurance and perseverance that has contributed to your legacies. The Good Lord will receive you and give you a special place in His kingdom.

Go Well Professor. Go Well Brother, until we meet again!

BOOK REVIEW

Leya Mathew
National Institute of Advanced Studies,
Indian Institute of Science Campus,
Bengaluru, India

Childhoods in India: Traditions, trends, and transformations, Edited by T. S. Saraswathi, Shailaja Menon, and Ankur Madan, Oxon and New York, Routledge, 2018, xxi + 449 pp., ISBN 978-1-138-10636-9

Childhoods in India: Traditions, trends, and transformations is a welcome addition to the scholarship about education in India. Its strength lies in its multi-disciplinary perspective and its recognition of childhoods as situated in socio-cultural contexts and the historic and contemporary political economy. The key tensions of the book emerge from a politics of location: on the one hand, the authors have to persistently reclaim childhood from Euro-centric norms that pass as universal principles, whether it be assumptions undergirding developmental psychology or child rights discourses. On the other hand, they have to address the genuine concerns of differently positioned children in a diverse and unequal country. The book attempts to hold these tensions productively and reflexively (p. 11). The sixteen chapters are organized in four sections: 1) history and politics of childhood; 2) socio-cultural perspectives; 3) education and schooling; and 4) law, practice, and policy.

Situating "India"

The chapters that examine colonial, post-independence, and neoliberal education policies (chapters 1, 3, and 9) situate childhoods in complex, intersecting, international and domestic relations of power mediated by the conditions of statehood. If the colonial state was premised on the notion that citizenship was what could not be granted to natives (Balagopalan, p. 28), the post-independence state was obliged to create citizens (Menon & Banerjee, p. 208), and the neoliberal state grants rights but as an accompaniment to structural adjustments that advance capitalist accumulation and exacerbate inequality (Raman, p. 69). These three chapters reveal how the logic of statehood mediates childhoods.

Examining colonial policies framed to protect and reform juvenile prisoners, children of coolie laborers and peasants, and factory children, Sarada Balagopalan (Chapter 1) argues that policies actively construed these child figures and their parents as different. Her twin analytical moves, historicizing and foregrounding child figures rather than childhoods, show how protection became the method of marginalization. Moving to independent India, Shailaja Menon and Rakhi Banerjee (Chapter 9) examine key policy documents related to primary education to document how dominant educational discourses construct children. They note a steady transition in the direction of romanticized, naturalized notions of child-centrism, which reduces social inequalities to individual differences and locates social change in individual enlightenment. Meanwhile, connecting national policies that address a de-contextualized child with globally circulating neoliberal policies of aid and structural adjustment, Vasanthi Raman (Chapter 3) notes that one, the discourse of child rights is itself a consequence of globalization and neoliberalism and two, neoliberal macroeconomic policies that have generated high growth rates have also exacerbated inequality and concentrated deprivation, and that these are structurally linked. The chapters urge researchers to situate childhoods in "larger and more historical workings of state and capital" (p. 39).

Policy Processes

Three chapters in the book examine specific policy processes (chapters 10, 11, and 16). Jyotsna Jha expands the scope of policy analysis by analyzing policy *through* programs, schemes, and directives of state and national governments. Focusing on two gender-related programs, Mahila Samakhya (MS) and select conditional transfer schemes (CTs), she argues that MS' explicit engagement with patriarchy led to more enduring changes at the individual and social level. However, when adapted within larger schooling structures, its critical feminist perspective was replaced with the narrow goals of measurable learning outcomes and certification (p. 235). Secondly, analyzing CT schemes in various states, she

contends that the success of the scheme depended on how far the scheme was able to take into account other forms of inequality.

R. Maithreyi further expands Jha's notion of policy by incorporating a genealogical analysis and ethnographic methodologies. She examines the contexts in which Life Skills Education (LSE) policy emerged and became popular, the different registers deployed for middle-class and marginalized children, as well as the messy interpretations and incomplete control of LSE programs in actual school settings. Her analysis contends that LSEs reduce "life" to ahistorical, acultural, psychologized and sanitized skills, which the middle-classes can use to market themselves in an increasingly competitive world. When deployed in non-elite contexts, LSE constructed "at risk" children and tied their success to "individual behavior and initiative." However, she also reports how the school space disciplined the LSE program, revealing the need for research to examine "policy-in-context" as much as policies are urged to apprehend "children-in-context."

The interface between policy and research is the focus of Venita Kaul and Meenakshi Dogra's chapter. The authors note that paradigm shifts in research, from developmental to sociological perspectives, from universal to multiple childhoods, and from normative to differentiated conceptions of children pose a new set of challenges for policy development. While policies find generalizable, standardized, quantified data convenient, emerging trends in research interrupt the assumptions and logic of such knowledge and policy production. The authors therefore suggest that policy goals, decisions, and implementations be iteratively guided and informed by rigorous, analytical research. To facilitate this process, Kaul and Dogra argue that research has to be clear and relevant, for instance, that investigators use mixed method designs, deploy culturally appropriate tools, have analytical rather than descriptive research goals, and report findings in accessible language.

Representing Childhoods

One of the unique contributions of the book is its attention to how childhoods are represented in popular culture. Four chapters examine representations of children, in mythology, cinema, and children's literature (chapters 2, 6, 7, and 8). Jane Sahi proposes an alternate and provocative paradigm for childhood based on the dynamic tradition of Bala Krishna (child Krishna) in Hindu tradition. She interrupts the dominant linear, developmental teleology of childhood with a child figure who is simultaneously powerful and playful, wise and mischievous, and extraordinary and ordinary. Noting that adults may find Krishna's transgression of normative childhood both liberating and threatening, she urges carers and educationists to re-orient education from a disciplinary mechanism to a space of delight and imagination.

In contrast to the fullness of Bala Krishna, Uma Chakrvarti and Nidhi Gulati examine the emptiness of non-normative categories. Chakrvarti examines the position of privileged girls in mythological narratives and in the 19th century; she argues that while mythologies erase and silence privileged girls, women narrate their own childhood in terms of violence. Girls were schooled into dominant expectations of womanhood through fasts, household labors, and notions of pollution and honor, with child marriage rupturing whatever childhood was accessible. She notes that lower-caste girls were free from middle-classed norms but were subject to the grief and vulnerability that follow from poverty. She thus questions assumptions of "happy and normal" childhoods evoked in writings of the past, arguing that these normalize upper-caste boys to represent all children. Meanwhile Gulati examines the emptiness of the orphan figure in Hindi cinema and argues that orphans in the cinematic imagination are a category "created to perform . . . acts of rescue, development, and progress" by privileged social actors (p. 174). Thus, on the one hand they become repositories of societal moral panic and on the other hand, they have to be reformed and civilized into hegemonic cultural performances. Rescue becomes the technology for disciplining the deviant.

Devika Mehra complicates the representation narrative by examining how children's literature increasingly uses marginalized childhoods to critique normative middle-classe childhoods. Analyzing four children's books, she notes how school is where marginalized protagonists encounter discourses, practices, and relationships that dehumanize them. Further, politicized childhood is implied as precipitating structural changes. Mehra however points out that the "reading child" targeted by children's literature is predominantly middle-class (p. 197) but stops short of asking how the proliferation of such texts coincides with middle-class requirements for children to display "higher order thinking skills."

Everyday Lives

Two review essays present the intimate and everyday lives of children inside and outside of school (chapters 5 and 12). Ankur Madan, Rajashree Srinivasan, and Kinnari Pandya focus on the interrelated dimensions of care, power, and autonomy that characterize parent-child relations. They point out that in urban, middle-class contexts, mothers' passive, diffused caring is shifting to deliberate, individualized attentiveness. Alongside, fathers are becoming less authoritarian and more involved. They suggest that new formations of care are perhaps also new forms of control as parents display care by producing competitive childhoods. They conclude that urban middle-class parents seem

to be "consciously reinventing the connotations of care and power" as they adapt to larger socio-economic and cultural transitions (p. 125).

Expanding the intersections of care and power beyond the middle classes, Rahul Mukhopadyay and Kamala V. Mukunda examine fear as a dominant affect of school life. They clarify that rather than locating fear in a psychologized, individualized interiority, they try to "understand fear as an *effect* produced in and around the subject, through different mechanisms of power" in both immediate relationships and structural locations (p. 277). Their review shows fear to be mediated and manifested through 1) social inequalities, which become embodied in teachers' indiscriminate authority, corporal punishment, and bullying by peers and seniors along caste, class, or religious differences and 2) curricula. In the hyper-competitive contexts of the middle-classes, fear coheres around failure in high stakes exams. In non-elite contexts, the middle-classed curriculum itself alienates and generates fear. The authors further examine alternate schooling systems for both middle-classes and non-elites, which interestingly, are organized in explicit relation to the cultures of fear discussed earlier. An analysis of what becomes recognized as fear and is designated unacceptable, by whom, and in what contexts, would have been equally instructive, for as the authors note, fear largely remains normalized and acceptable.

Childhoods Beyond Education: Law, Pediatrics, and Nutrition

Though education is often portrayed as the proper domain of research on childhoods, the book makes excursions into law, pediatrics, and nutrition to emphasize that childhood is lived across diverse social institutions (chapters 13, 14, and 15). Asha Bajpai examines the contradictory role of law by examining permissive legal reforms and protective legality. Bajpai notes that the Juvenile Justice Act of 2015 lowered the age at which children can be tried as adults to 16 in response to the Nirbhaya gang rape case even though juvenile crime is only 1.2 per cent of total crimes committed. Similarly, child labor law reforms provided scope for children below the age of 14 years to be employed in non-hazardous industries. Alongside, she describes how legal systems in Delhi, Goa, and Mumbai have set up provisions and practices like in-camera proceedings, prohibition of aggressive questioning, and even rehabilitation to protect child witnesses and child victims. She concludes by observing that child rights become meaningful only when the legal system can deliver substantive justice.

Pratibha Singhi and Arushi Saini present an overview of pediatric practice in both traditional Ayurvedic and modern medicine since parents in India often patronize both systems simultaneously. They distinguish the former as more holistic and social and the latter as specialized and techno-biologized but caution that socio-cultural factors mediate both. For instance, preference for boys can materialize through rituals like *pumsavana* or sex identification technologies. Similarly, situating nutrition in practice, Shreelata Rao Seshadri makes the case that human beings relate to food along biological-cultural, symbolic, and nutritional dimensions as well as along the psychological and social functions of food. However, public health policies intractably reduce food to measurable nutritive elements. She further elaborates the politics of nutrition since large national programs like midday meals in government schools mostly provide vegetarian meals even though over 67 per cent of Indians are non-vegetarian (pp. 361-362). Thus, while public health policy should be sensitive to the cultural context of nutrition, and promote dietary diversity and control over food choice, it operates at the intersections of technologized nutrition and cultural politics. Nandita Chaudhary (chapter 4) suggests that while developments in medicine, pedagogy, and rights discourses may have technologized and brought about improvements in childhood and research on childhood, globalization has largely eroded diversity of childcare practices and amplified control through formal schooling.

Childhoods in India situates children and research about children historically, socio-culturally, and politically across multiple disciplines. The book will be of interest to scholars of educational psychology, public policy, and sociology of education.

MAJOR CONFERENCES OF INTEREST

June 21–June 22, 2018
2018 Singapore Conference on Applied Psychology (SCAP 2018)
Location: Singapore
Web: https://scap.ear.com.sg

June 24–June 27, 2018
International Congress of the Royal College of Psychiatrists - Psychiatry: New Horizons
Location: Birmingham, United Kingdom
Web: http://www.rcpsych.ac.uk/internationalcongress

July 15–July 19, 2018
Biennial Meeting of the International Society for the Study of Behavioural Development
Location: Gold Coast, Queensland, Australia
Web: https://issbd.org/ContentDisplay.aspx?src=upcomingmeeting

July 19–July 22, 2018
4th Bi-annual meeting of the European Society for Cognitive and Affective Neuroscience
Location: Leiden, Netherlands
Web: https://escaneurosci.eu/p/dZ7xbq

August 21–August 25, 2018
32nd Annual Conference of the European Health Psychology Society - EHPS 2018
Location: Galway, Ireland
Web: https://ehps.net/2018/

August 28–August 30, 2018
The British Psychological Society - Social Psychology Section Annual Conference
Location: Keele, Staffordshire, United Kingdom
Web: http://www.bps.org.uk/social2018

September 5–September 7, 2018
2018 International Symposium on Education and Psychology - Fall Session (ISEP-Fall 2018)
Location: Hangzhou, China
Web: https://tw-knowledge.org/isepfall/

October 25–October 26, 2018
20th ICPLR 2018 - International Conference on Psychology & Language Research
Location: Colombo, Sri Lanka
Web: https://www.gplra.org/20th-icplr-2018—international-conference-on-psychology-and-language-research-sri-lanka-25-oct—26-oct-2018-about-65