Designing for Development: Across the Scales of Time

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This essay traces the history of an activity designed to promote the intellectual and social development of elementary-age schoolchildren during the afterschool hours. Following in the footsteps of Urie Bronfenbrenner, I highlight his argument that just as all human development occurs in contexts of varying levels of inclusiveness and mutual interchange, human development occurs at intersecting scales of time that themselves vary in character and duration. The task of exploring Bronfenbrenner’s idea confronts scholars interested in person-context coconstitutive processes with a difficult methodological requirement; they must study simultaneously the history of persons (at the microgenetic and ontogenetic time scales) as well as the history of “the contexts of development” in which the persons participate. A project implementing such a study focused on the life course of the system of activity is described, followed by a discussion of the lessons to be learned from a temporally extensive study of persons developing in contexts that are themselves changing.

Keywords: Bronfenbrenner, context, design experimentation, mesogenetic methodology

Over the decades, developmental researchers have been carrying on a clandestine affair with Clio, the muse of history. . . . I suggest that after so many years, the developmental researcher’s illicit liaison with Clio is no longer a tenable arrangement; it is time we embraced her as a legitimate partner in our creative scientific efforts.

(Urie Bronfenbrenner, 1983, p. 176)

This essay is based on remarks that were prepared to honor the scientific legacy of Urie Bronfenbrenner, a treasured colleague who had a profound effect upon my own professional development. My goal here is to honor his memory by focusing our attention on his long time flirtation with Clio—the temporal characteristics of the person-process-context systems that were the frequent focus of his attention—The T in his well known “PPCT model” (Bronfenbrenner, 2005). In particular, I want to highlight his notion that just as all human development occurs in contexts of varying levels of inclusiveness and mutual interchange, human development occurs at intersecting scales of time that themselves vary in character and duration (Bronfenbrenner & Morris, 1998; cf., Lemke, 2000).

To the extent that this way of thinking about time and context in development is correct, it suggests that scholars interested in person-context coconstitutive processes are confronted with a difficult methodological requirement; they are committed to studying simultaneously the history of the person (at the microgenetic and ontogenetic time scales) and the history of “the contexts of development” in which the persons participate. How else, given that both person and context are coconstituting the process of change, could one study the core theoretical principles of the theory? Easy to say, difficult to study properly.

Putting Time Into Context

Urie’s use of the metaphor of Russian matrochki (embedded dolls) to represent contexts of human development as a set of nested scales has become so ubiquitous, that it is rarely remembered that his seminal monograph on the ecology of human development carried the subtitle: “Experiment by nature and design.” The distinction between “nature” and “design” in this formulation is an important one for many reasons, one of which is that time enters differently into the two forms of experimentation.

Experiments of Nature

By experiments of nature, Urie referred to sudden changes in the ecology of development resulting from large scale events such as revolutions or depressions. He illustrated this approach by referring to Glen Elder’s (1974) work on the great Depression of the 1930s and Alexander Luria’s study of cognitive-psychological changes associated with the rapid industrialization of Central Asian nomads (Luria, 1976). He strongly endorsed Elder’s “life course” approach to the study of ontogeny, which ineluctably led to the study of the influence of sociohistorical circumstances on the developing person and studies of the linkages among people in
time and space. The massive growth of the life course movement in the past several decades certainly justifies his judgment concerning this important methodological tool (Mortimer & Shanahan, 2003; Nelson, Fox, & Zeanah, 2014; Overton, 2014). Similarly, following in the tradition illustrated by Luria’s studies in Central Asia, several cross-cultural researchers have greatly advanced the study of psychological change during periods of rapid sociocultural change (Greenfield, 2004; Rogoff, 2003, 2011; Saxe, 2012), combining ethnographic and psychological methods in a manner appropriate to the people and cultural practices upon which they focused.

The value of this work is well appreciated. But here my focus will be on the second strategy, “experiment by design.” How do temporal issues play out when we are studying changes we ourselves have brought about by implementing our designs for development?

Experimenting by Design

When he first wrote about experimentation based on design, Urie took as his model a Vygotskian-inspired mode of designing development-enhancing practices that he referred to as “transformational experiments.” He reports a conversation with A.N. Leontiev, then dean of Soviet psychology, which concludes with the following summary judgment by Leontiev:

It seems to me that American researchers are constantly seeking to explain how the child came to be what he is; we in the U.S.S.R. are striving to discover not how the child came to be what he is, but how he can become what he not yet is. (Bronfenbrenner, 1979, p. 40)

From his colleagues at the Institute of Psychology at the time (the early 1960s), Bronfenbrenner encountered the idea of a transformative experiment. He describes his views on this form of design experimentation as follows:

Soviet psychologists often speak of what they call the “transforming experiment.” By this they mean an experiment that radically restructures the environment, producing a new configuration that activates previously unrealized behavioral potentials of the subject. Russian developmental psychologists have indeed been ingenious in devising clever experiments that evoke new patterns of response, primarily in the sphere of psychomotor and perceptual development (Cole & Maltzman, 1969). But once Soviet research moves out of the laboratory, the control group disappears, systematic data yield to anecdotal accounts, and the transforming experiment all too often degenerates into dutiful demonstration of ideologically prescribed processes and outcomes. (1979, p. 40)

I believe that the problems of design experimentation that “moves out of the laboratory” are endemic to the scientific challenges involved and are not restricted to conditions of strong ideological constraint. I also believe that Davydov and Markova, who conducted a number of such efforts in Soviet schools, made an important and overlooked point when they emphasized that in addition to studying processes of transforming the environment in order to create new forms of the psychological functioning, it is also important to study “the conditions of occurrence of specific mental phenomena, and experimental reproduction of the conditions necessary for all of this to occur” (Davydov & Markova, 1982, p. 63). This latter concern is central in our own work.

In recent decades the idea of experiment by design has emerged from the margins of developmental science under a variety of names, most prominently design-based research (Brown, 1992; Collins, 1992; Collins, Joseph, & Bielaczyc, 2004; Penuel, 2014) and formative intervention (Engeström, Saminno, & Virkkunen, 2014). Our own work fits under this very broad umbrella (Brown & Cole, 2001).

Consistent with other experiments by design, we began our inquiry by conceiving a new form of activity. Then we developed a prototype, tested it out, and finally implemented it for evaluation, critique, and iteration. But consistent with Urie’s identification of a Life Course methodology as central to developmental-ecological thinking, we believed that the logic of a “person-process-context” approach requires us to trace the history of the designed activity as well as the development of the persons within it over time.

With similar concerns in mind, Bronfenbrenner and Morris (2006) emphasized the need to trace time with respect to each of the hypothetical levels of context associated with their persons-in-context approach. They referred to “mesotime” as the system of periodicity of various “microsystem” episodes (bed time story, mealtime, etc., all microgenetic events that occur in the mesosystem of family life). My colleagues and I have used the term “mesogenetic method” in a similar fashion. In our case, mesogenesis refers to the time scale of the implementation of the designed intervention and the institutional partnership that constitutes its exosystem. Such an approach, I argue, is of special relevance to those developmentalists whose theories lead them to create new cultural practices designed to promote development. Applied in this fashion, a mesogenetic methodology might be considered a study of the lifecourse of the activity, within which promoting “behavioral potential” is the overall goal.

Phase 1: Designing the Fifth Dimension

Our project began in 1982 when a prototype of the Fifth Dimension (5thD) was created as part of a hastily organized after-school program. The activity was designed to promote the development of literacy among struggling students whose parents and teachers agreed with policymakers that the children needed “extra time on task” if they were to achieve high school graduation (Denham & Lieberman, 1980; Laboratory of Comparative Human Cognition [LCHC], 1982).

A number of design features, many of them derived from the work of Vygotsky and his followers, served as the principles for implementing 5thD activities (for more detailed discussion, see Cole, 1996; Cole & the Distributed Literacy Consortium, 2006; LCHC, 1982). These included:

1. An emphasis on context. Here several points were crucial. First and foremost, we were designing for the afternoon hours, which, as Halpern (2002) pointed out, emerged historically as “discretionary time, a counterpoint to the rigid schedule and adult agenda of the

1 “The exosystem encompasses linkages and processes taking place between two or more settings, at least one of which does not ordinarily contain the developing person, but in which events occur that indirectly influence processes within settings that does contain the person” (Bronfenbrenner, 2005).
schools” (p. 180). By virtue of the fact that participation is discretionary, it is essential that the children find the activities attractive.

2. The deliberate mixture of leading activities, understood as forms of activity that children at a given age find most motivating and that, through their participation, promote their development (Elkonin, 1977). Every 5thD included the broadest possible range of motives for participation inclusive of girls as well as boys, older schoolchildren as well as younger. Of particular importance, in light of the need to attract children who could not be compelled to participate, was the featuring of play, in the form of computer games, board games, arts and crafts, and the like as part of the activity.

3. The strategic organization of intergenerational interaction. The 5thD involved the routine participation of undergraduates and children ranging in age roughly from 6 to 12 as well as staff. Undergraduates played the role of older “buddies,” not authority figures. Here the design goal was to reduce imbalances in power and encourage active engagement by all, while maximizing the conditions for creating effective zones of proximal development.

4. Maximal exploitation of varied mediational means to create rich opportunities for communication via spoken and written language and other forms of inscription on computer screens, paper, and digital media. This feature was designed to put into practice Vygotsky’s (1987) idea that “the thought is completed in the word.”

As reported in LCHC (1982) the first implementation of a 5thD was deemed a success. The teachers and parents viewed the activities as useful for the children, and we were able to document many successful learning episodes in which the children read, wrote, reasoned, argued, and had fun. Routines for providing ample access to all the children who wanted to participate became a welcome challenge.

Phase 2: Implementing the 5thD Beyond the Conditions of Its Design: The Birth of a Mesogenetic Methodology

As attractive as it appeared to be, there was no way to assess the effectiveness of the 5thD as a stand-alone activity because it was so bound up with the other afterschool activities of which it was a part. Moreover, our contextualist approach urged us the need to implement the design in a variety of institutional settings in order to determine how the 5thD and its institutional context shaped each other. It was 5 years before we got a second chance.

A design experiment that focused on the nature, effectiveness, and sustainability of 5thDs began in 1986 with a year during which members of the LCHC research team visited local institutions where children participated afterschool to determine if they might be interested in developing new activities for children involving desktop computers and computer networks. Workshops throughout the year focused on a variety of computer-mediated activities that people could choose among. Four institutions signed on to the 5thD as appropriate for their institution: the elementary school, a Youth Club catering to K-12 children after school, the local public library, and a city-run Day Care Center, and an elementary after-school program (this phase of the work is described in greater detail in various publications, including Cole, 1996 and Nicolopoulos & Cole, 1993).

We conceived of each 5thD in terms of Urie’s model of context imagined as concentric circles (see Figure 1). In each 5thD, children engaged in spoken and written interactions in small groups mediated by computers, board games, and a set of rules for their use. Play, learning, and presence of friendly college students, mixed together in each setting, but in configurations unique to each. Each level of context is documented according to its own appropriate methods.

Each implementation, in turn, was conceived of as a three-part system involving a partnership between a University or College and a local Community Organization involved with children in the afterschool hours. Viewed theoretically, a 5thD mediates the joint activity of two institutions that share a common objective—the healthy development of the children and their undergraduate buddies. It is this ensemble of relations that constitutes the exosystem of the 5thD (see Figure 2).

The first central task of design-based research, to claim that the design has succeeded, is to implement it, at least to the degree that it attracts participants, attains an accepted local name and identity, and occurs on a regular basis. Does it “take hold”? It is essential to know whether the designed activity generates forms of interaction more or less the way that theoretical expectations had led us to expect when the experiment is formally at an end. In the study of this “taking hold” phase of the work, qualitative data dominate the research process (Bremme et al., 2006).

Figure 1. A “nested context” representation of the 5th Dimension. Note that each level of context is associated with its own appropriate sources of data.
The “Exosystem” of the 5thD

UNIVERSITY

COMMUNITY

5thD

University students participate in 5th D as “Practicum” course, Community Org Provides kids and space and staff time, researchers participate in implementation of activity and documentation

Figure 2. The basic structure of a university–community partnership for implementing a 5th Dimension.

The second central task, of course, is the need to determine whether the activity in fact produces the cognitive and social changes for which it was designed: Do the children acquire the valued knowledge, skills, and social dispositions that served as the criteria of success? Is their developmental potential made visible and encouraged there? Here a mountain of methodological difficulties enter the picture. Moreover, such difficulties have to be addressed anew for each implementation, since each represents “a different 5thD in its exosystemic context.” As will become clear, evaluation in quantitative terms that satisfy the logic of random assignment and experimental control was a difficult, only partially successful, but always time consuming part of the implementation.

Having established that the activity is in fact implemented in a way that the embodies the theoretical principles and attracts participants, it becomes possible and necessary to understand the process by which the designed activity does or does not succeed in continuing to attract the resources needed to “maintain itself,” once the external support that gave birth to it has been withdrawn. In Larry Cuban’s terms, we need to assess the extent to which the activity has accrued a constituency, people who are prepared to constitute it through their joint supportive efforts (Cuban, 2001, cited in Nocon, 2004). That is, we had to study the sustainability of the activity over its lifetime.

In our case, because conduct of the activity required the cooperation and support of both University and Community institutional partners, we set as our criterion for continuing the partnership a 50–50 division of the costs and responsibilities necessary to run the program after the period of full funding ended.

To maximize the time for implementation and evaluation we arranged for the first three years of the implementations to be conducted as a more or less standard experiment-by-design. UCSD faculty and their students took the lead in organizing the activities at the site alongside local staff to implement program in an agreed-upon manner and to keep the undergraduate’s need for a good education firmly in mind.

We university folk agreed that so long as the community organization met its half of the bargain, the university would continue to provide an appropriate course and the participation of supervised undergraduates, as well as ongoing support in training local staff, implementation, and the search for external funds for the local site. We assumed that for all practical purposes, UCSD could hold up its end of the bargain long enough to gather the data it needed.

Death and Re-Generation: Lessons Learned From the First Implementations

As the program was prepared for implementation for the upcoming school year, the school district’s tech coordinator became concerned for his modest supply of computers. Consequently, no program was implemented. After the second 10-week quarter, the Day Care Center ceased participation. The problem was not with the quality of the program. Adults and kids alike were pleased with the activity. The factor that put an end to the Center’s 5thD arose in the macrosystem—the then-current social concern over child abuse at day care centers nationwide, and a well-publicized, regional case. The 5thD may have been a valued addition to the Center’s programming but it was not worth the cost of keeping track of new generations of undergraduates every 10 weeks. The 5thD was toxic to its hosts and was terminated. Both of these cases clearly illustrate that “successful innovations” can fail well before the time when provision of external resources is due to run out.

The 5thD at the Library was the most successful of the original implementations, in terms of our indicators of cognitive and social development. Parental demand resulted in doubling of the size of the program for its second year. The setting of the Library with its norm of quiet information seeking afforded (relatively) quiet interaction around intriguing activities. Intense friendships quickly grew among children and undergrads. But despite the offer of adequate funds from the local Library support group, the head librarian judged that it did not align with the county’s evolving strategy of library use of computers, and the activity ceased.

The Youth Club 5thD was also popular with the children and welcomed by the Program Director at the Club. But this 5thD created special difficulties of implementation and evaluation for the researchers. The door to the 5thD room, visible behind a large glass window, was always open and children could come and go as they pleased. It was voluntary with a capital V! A great deal of energy and attention focused on holding together enough structure to make possible the appearance of the forms of interaction for which the 5thD was designed. There was evidence that this effort was at least partially successful and that the children did in fact learn and develop through their participation in this 5thD. But success in implementing the designed activity and in evaluating it according to ordinary experimental logic was an ongoing challenge.

Despite its relatively modest accomplishments from our perspective, the Youth Club forced us to rethink the methodological requirements for conducting design experiments in Bronfenbrenner’s PPPT model. Responsible adults at the Club linked the 5thD and they wanted to continue the partnership. They offered to pay a staff member 10 hours a week to oversee the 5thD and offered to collaborate with UCSD to raise funds for new equipment, maintenance, and supplies. It was not yet the 50–50 arrangement that was our goal, but it was progress and we committed to cover the class and provide supervision of students for the coming year.

This unexpected outcome created a paradox: the Library 5thD, the closest approximation to our ideal of an activity with the transforming potentials we had set out to design, had ceased to exist. By contrast, the Youth Club program, for all of its challenges of implementation, was a living, valued, social entity, a recognizable meso-level system where learning and development were
clearly in evidence. This outcome induced us to realize that what constitutes a successful implementation at one level of context may not coincide with what counts at success at another.

The continued life of the Youth Club forced us to take seriously the obvious point that long-term sustainability could be no less a problem at the University than it was in the Youth Club. At the outset we were terribly university-centric, despite our good intentions and the symmetry of our triangles. We had treated the need to worry about sustainability at the University as a distant and unlikely problem. When that unlikely problem became a reality, we feared that at best we could arrange continued support of the University to continue the program at the Youth Club for another year. After that we were pretty sure that keeping the UCSD course going each quarter, finding someone to teach course, and the cost of maintaining a small practicum course would become too burdensome from the University’s perspective. Consequently, in the absence of external funding, the 5thD project had a lease on life, but was headed for termination, this time precipitated by difficulties of reorganization at the University.

It was in the course of absorbing these lessons that we began to conceive of a mesogenetic methodology for design experimentation; as noted above, such a methodology must be capable of linking the dynamics of development “within” the designed activity that gives it value (evidence that children and undergraduates are learning and developing) with the fate of the activity itself in the form of an institutional-level constituency that can provide the required resources. Bronfenbrenner and Morris (1998) suggested that “mesotime” regulates the frequency with which the activity takes place and is therefore also constitutive of the proximal environment of development. They imagined mesotime processes that extend for days and weeks. We had come to view ourselves as studying developmental change in an exosystem that had already extended for years. Now three levels of temporal scale were involved: the Microsystemic processes of the living interactions in the 5thD, the Mesosystem that constituted to the institutional “proximal context of development,” and the Exosystem of a university community collaboration.

Phase 3: Expanding Variety, Expanding Time

Critical to the continuation of the 5thD was the emergence, unplanned for, of new implementations of the 5thD in the suburban region. Seeing the system expand as if spontaneously was not part of our design! Two of these second generation spinoffs involved other branches of the Youth Club and they died away when recessionary times hit the Club and UCSD was maxed out in terms of its ability to provide more support. One, however, was begun in a Church located in the Latino barrio not far from the University to continue the program at the Youth Club for another year. After that we were pretty sure that keeping the UCSD course going each quarter, finding someone to teach course, and the cost of maintaining a small practicum course would become too burdensome from the University’s perspective. Consequently, in the absence of external funding, the 5thD project had a lease on life, but was headed for termination, this time precipitated by difficulties of reorganization at the University.

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Just as local fiscal support for the 5thD seemed to be waning, interest in the 5thD continued to grow in educational and academic circles. Hype around the potential of digital technologies to promote literacy and numeracy was intense, and no one had a clear idea about the variety of their potential uses. As a consequence we were given the opportunity to take a next step in the research program and add additional cases to see whether we could better specify the process of design experimentation involving study of the life course of the activity as well as evidence of “designed for” changes in the children.

In our next round of research, we set out to ask some seemingly obvious questions about the institutional and sociocultural factors associated with creating effective and durable 5thDs. For this purpose we recruited a number of colleagues who held faculty positions in different institutions of higher education and an interest in seeing for themselves if the 5thD was a developmentally productive form of activity or a unique event. The resulting research partners represented different kinds of institutions of higher education (college, teaching university, research university), different departmental affiliations (psychology, education, communication, human development) different kinds of community sites (youth clubs, churches, afterschool programs at schools) and children differing in social class, ethnic, and age ranges. A total of 10 sites participated in a collaboration, each its own version of a “5thD in its context.”

Over the next six years, this round of research allowed us to continue tracking 5thDs that had already come into existence while adding a variety of new systems representing a broad range of institutional arrangements, that were then tracked over the subsequent several years (see Cole & the Distributed Literacy Consortium, 2006). Special teams, each drawing members from several of the sites, were organized to focus on key issues of evaluation, keeping in mind that the most effective forms of assessment would differ from site to site. Documentation ranged from ethnographic field notes, specially designed quantitative assessments, analysis of videotaped interactions, interviews, annual reports, and publications.

At the time of this writing (June, 2015), four of the ten 5thDs that began the Mellon Project in 1990 remain in operation, each recognizable as a local variation on the initial design. Another lasted 18 years, but closed when its host institution closed for a two-year-long remodeling hiatus and changed its programming so that the 5thD was no longer relevant. We will examine this case in detail below.

Most of the remaining 5thD systems that were a part of this project lasted from 2 to 4 years. In two cases critical design features of the 5thD turned out to be toxic to the people in the community institution. For example, in a small college town, local staff Youth Club staff objected to the mixing of genders and the horizontal social relations that were central to the 5thD’s design for maximizing children’s agency.

In three cases, failure occurred because the hybrid form of activity was toxic in the university setting. In two examples, the PI’s research and the value of their practicum classes were devalued by faculty psychologists for their lack of laboratory control procedures of the kind that they demanded of their faculty and wished their students to learn. Symmetrically, the work of those with positions in education departments was devalued because the activity did not provide experience in existing school classrooms.

2 Made possible by a grant from the Mellon Foundation.

3 These institutions included: Appalachian State University, CSU San Marcos, Elon College, Erikson Institute of Early Childhood Education, Michigan State University, UC Santa Barbara, UC San Diego, University of New Orleans, and Whittier College.
the setting for which they were preparing their students and conducting their own research. The consequence for the 5thD in such cases was that the requisite practicum course was marginalized within the curriculum, making it impossible to provide the requisite conditions at the community site. Nor did it help matters that faculty were discouraged from conducting research there. In Urie’s terminology, exosystem support failed to be sustainable.

With several sites in operation as this round of external funding came to an end, the time scale of the research became a real issue, both theoretically and as a practical matter for the researchers. As matters turned out, yet another period of expansive growth both contributed to the survival of those several systems in existence and this continued development posed a new set of concerns about how to continue a design experiment that was entering its second decade.

History Re-Enters the Design Experimentation Process: The Birth and Development of UCLinks

I noted earlier that the design experimentation on the 5thD began in the early 1980s at a time when several social forces converged (a push for using afterschool hours to improve academic performance, particularly for children performing poorly in school, intense interest in the power and promise of new digital media, etc.). These circumstances made 5thD-like forms of activity appear attractive not only to many colleagues interested in the study of learning and development, but to many local community organizations as well. With the provision of renewed resources for both implementation and documentation, several of the 5thDs thrived. However, by the middle of the 1990s there came a point when the patient support of the sponsoring foundation came to an end and all but one or two of the ten 5thD systems which were a part of the project began to experience serious difficulties.

Then, owing to what Urie might have termed an experiment of nature, the initial design experiment underwent another round of expansion. Responding to ongoing political and legal debates roiling higher education, the Regents of the University of California voted to end affirmative action as a part of the admissions process. The Los Angeles Times reported that the regents’ vote signaled “the end of an era in which the state made special efforts to open its prestigious university campuses to minorities and set a standard for diversity in higher education in America” (Wallace & Lesher, 1995).

This decision did not sit well with members of the research consortium who had grown up around the 5thD; they were seeking methods to decrease educational failure and increase inclusion of marginalized peoples. As a group we felt we had demonstrated that we could create afterschool activities that promote learning and social development for historically marginalized children in addition to providing an exemplary educational experience for undergraduates. At the political level, it was clear to any informed observer that the University needed to make some gesture toward diversity to ward off adverse public criticism that it had abandoned its mission. The California members of the research consortium chose to treat this crisis as an opportunity. We proposed to the UC administration that it create a statewide, University of California version of the 5thD-style afterschool programs, calling upon the committed presence of interested research faculty on the University’s many campuses.

This proposal immediately resonated with the incoming President of the University, Richard Atkinson, and in the fall of 1996 provisional resources were provided for the creation of university-community partnerships on each UC campus.

Clearly this iteration of the original design experiment entailed a quantum leap in the complexity and variety of activities included. No longer was it reasonable to assume the 5thD as a model activity; subject populations ranged in age from K–12, whereas the 5thD was designed for middle and upper elementary school-age children. Moreover, each site was organized and directed by its own, involved faculty and they in turn created UCLinks within which each local system adhered to the university-community collaboration model focused on a jointly run activity, while using intellectual and institutional resources that best suited the nexus of their professional interests and local possibilities. Each had his or her own way of thinking about computers, kids, afterschool, and development. Each faced a unique set of challenges given their position both within the university and unique relations with their partnering community organizations.

Under these circumstances, some sites in fact used the 5thD as a design tool for their activities, whereas others adopted its general pedagogical commitments and entered into joint activity with a community organization, but organized the activities of the children, youth undergraduate, and graduate students according to local concerns and interests. All of the questions I raised concerning the 5thD as an example design experiment clearly apply to the UCLinks effort as well (there are roughly 40 projects currently receiving support from UCLinks in California; see uclinks.berkeley.edu). However, this large and growing body of data has yet to be extensively analyzed. So, for present purposes of illustrating a life course approach to design I focus on the original survivor of the first phase of the research—a key, long-lasting site for which we collected data at several relevant sociocological scales—The 5thD at the Youth Club. After examining the fate of this program in some detail, I will return to consider what, at this juncture in the 5thD design experiment, we have learned and what appear to be the challenges ahead.

By analyzing this case I intend to emphasize three values of studying an initially successful, designed activity such as the 5thD over long periods of time.

1. It is possible to collect meaningful data at several levels of analysis within the set of relations that constitutes a 5thD. Hence, temporal change at micro-, meso-, and exo-systemic levels is reachable, at least in principle.

2. Given the right circumstances, experiments by nature and experiments by design may be observed as they intersect; when this occurs, data collected at the micro level can reflect events originating several levels of context away.

3. Documentation of the day-to-day life of interinstitutional communication and collaboration over long periods, including times when there are significant stresses in the “successful, business as usual” life of the system, provides critical data about points of difficulty in maintaining a jointly valued activity.

4. Joint mediated activity requires ongoing interaction among the collaborating institutions. In Nocon’s terms, sustainability is a process, one requiring sufficient communication,
collaboration, and creativity to be able to continue (Nocon, 2004). The coordination of two institutions to conduct a joint project of this kind requires a process of constant adjustment and a fine command of the art of workarounds.

The Extended Life and Eventual Demise of the Youth Club 5thD

As I noted earlier, at the end of the first round of project in 1991, the Youth Club began to support a staff member 10 hours a week to oversee production of effective 5thD sessions in collaboration with staff from UCSD. We knew that this commitment of salary was not enough of a contribution to reach parity, but it seemed a promising beginning from which to evolve. An collaborative arrangement for seeking the needed resources locally began and continued in an amicable and mutually supporting fashion throughout the project.

Over time it became clear that although the search for resources to purchase computers and means for their upkeep proved to be adequate if not elegant, the problem of staffing at the Club remained a continuing worry. Small improvements were made in staff pay and arrangements for training, but when one goes through the archive of fieldnotes written over the subsequent decade and a half by the UCSD staff who filled the role of 5thD cocordinator at the Youth Club, a constant pattern of tension emerges, even as the activities continue and are valued. The pattern was the following: in those cases when the Club hired a former UCSD graduate with both theoretical background and prior experience of the 5th D to be their Club 5thD staff member, the program ran with a minimum of unexpected problems. By contrast, when the Club assigned an existing staff member, or hired a new staff member for this position, the result repeatedly left UCSD staff feeling that they were having to carry well more than half of the load of performing a successful 5thD session.

The problems persisted year after year. Rapid turnover of part time staff was nothing new to the Youth Club, but finding qualified part time staff who could work with people from the local University seemed to pose ongoing monetary and organizational problems with only temporary solutions.

At the same time, the fieldnotes that signaled ongoing tensions over responsibility for maintaining the 5thD also revealed an important internal dynamic operating in the system; LCHC staff people who began their fieldnotes by complaining that their Club counterpart was not working up to agreed standards almost invariably ended those same fieldnotes with descriptions of successful, satisfying interactions. Sessions that started in repair mode were routinely reported as, and remembered as, “another good day at the 5thD” despite the difficulties.

This pattern points to a clear discrepancy between the success of the 5thD as it was experienced by those who participated in it and its failure to achieve its agreed division of responsibility and foundational support. The two realities lived side by side, even in the fieldnotes written in the middle of the process.

It was not until 15 years after its birth that the problem of Club staffing of the 5thD rose to the level of a systemic crisis. In so doing, the 5thD provided a rare empirical illustration of how seemingly remote events in the macrosystem can have a dramatic effect on the quality of interaction at the microlevel of an after-school activity, for better and for worse. The sequence of those events, in turn, revealed an overlooked source of historical change in the regional ecology of the 5thD that eventually led to its eventual demise.

How the Iraq War Saves the 5thD: A True Story

During the summer of 2002 the Club hired a new 5thD coordinator, a young community college graduate who had taken a course on computers, but had no familiarity with the 5thD. We arranged as usual for the staff member to work with us to learn what was needed to run the 5thD, but this new staff member failed to turn up for the scheduled meetings, even meetings called by the Youth Club itself to address issues of training and coordination. After the first month of the fall quarter of 2002, the inadequate performance of the 5thD coordinator became a constant topic in the fieldnotes of LCHC staff members. After repeated efforts to remedy the situation through proposals for extra training that went unfulfilled, it was concluded that the overall situation with the Club was not likely to change. However good things were for the kids and the undergrads, the division of responsibilities was simply not getting better. We were still not splitting the work 50–50, we were not making progress, and this was our 15th year of seeking to get a stable, quality program running at a sustainable level of cost and effort. Reluctantly the decision was made to tough out the year, reduce our own contributions to the activity to a level commensurate with that provided by the Club, and document the anticipated demise of the 5thD.

These plans were interrupted in late November when the Club’s 5thD staff member was called up by the National Guard for two weeks of training. As a stopgap measure, the Club assigned a local part time employee (“John”) who had been supervising the Club’s homework activities in the Club’s library room to become the supervisor of the 5thD as well as homework activities. John had grown up in the neighborhood, gone to a local high school, and graduated from San Diego State University. At the time of these events he was a stay-at-home father with a 5-year-old daughter. He lived across the street from the Club. To make room for the change, the large 5thD room was divided so that homework took place in one half, the 5thD in the other, and the activity continued.

LCHC staff anticipated even more difficulty conducting the site, given John’s unfamiliarity with the 5th D as well as the challenge of putting the 5th D and homework help into the same room, even if the space was partially divided by bookshelves to mark off the two activity spaces. But to our surprise, during the two weeks when John was running the 5thD, the activities ran at what intuitively felt like a very satisfactory level. John seemed to enjoy the 5thD, engaging both children and undergraduates in what seemed to LCHC staff to be an inviting and appropriate way. However, when the Club’s regular 5thD coordinator returned from training, the old patterns of behavior immediately reemerged and our count-down to closing continued.

Then in March of 2003, the United States went to war in Iraq. The regular 5thD coordinator was called up to active duty. John’s position as temporary supervisor of both the homework activities and the 5thD became permanent.

Data linking the quality of interaction at a micro level within the 5thD to the change in staff as a consequence of the Iraq war were obtained from student fieldnotes, written after each 5thD session. We used as our baseline data the corpus of fieldnotes written by undergraduates during the fall quarter when the problems with the
program seemed so acute that we had decided to abandon the program. We compared these fall quarter notes with those in the spring at which time John had established himself as the Club’s 5thD coordinator. These fieldnotes were then mined for every interaction that mentioned Club 5thD staff member in charge and any of three UCSD researchers who collectively fulfilled UCSD’s contractual 50% role in conducting the program.

Illustrative results of this analysis are shown in Figures 3. The top half of Figure 3 is a pie chart illustrating the percentage of fieldnotes in which a Club or UCSD staff person is noted interacting with children in the fall and the spring quarters. The data in the top pie chart show clearly that in the fall quarter the Club 5thD staff person interacts with the children only 1/3 as much as the UCSD staff. In the spring quarter this percentage was reversed. John took the lead in interacting directly with the children.

The same pattern of results, in which approximately two thirds of the essential functions of supervision fell to LCHC staff during the fall but then two thirds were carried out by John were found for such indicators as interacting with the undergraduates, taking action to support maintenance of the local 5thD culture, and making suggestions for improvement of the activities.

Subsequently, John became the permanent 5thD staff person at the Youth Club. The 5thD not only survived, but seemed to thrive. For the first time since we had undertaken our collaboration, and for the next three years, the 5thD seemed fulfill the goals we had set for it at the outset. On any given day, 40% of the children attending the Youth Club participated for at least part of their time in the 5thD which itself became better integrated with other activities organized for the children at the Club.

Stealth Wealth Kills the Fifth Dimension

In 2005, by which time the 5thD was operating in what we considered an exemplary manner, a completely different, unattended, source of change resulted in the termination the program at the Youth Club. This time, the crisis arose in the relation between the Youth Club and its Community context. Socioeconomic changes over the past two decades in the San Diego region had changed the composition of the local city’s population and hence the constituency of the Youth Club. When the 5thD was first introduced into the town, prices of single family homes in this seaside suburb averaged $200,000. Over the next decade these prices doubled, and when the Club’s directorship decided to replace its existing facilities and close the 5thD, single family house prices had reached approximately $800,000 (in 2015 the average price of a single family home is $1,040,000; Sandicor, n.d.).

With this change in the wealth of the community, there came a shift in community support for the Club. Upper-middle class and wealthy parents saw little value in the afterschool program, including the 5thD at the Club; they had no difficulty supplying their children with computers and tutors. The once-successful educational innovation of 1987 was still successful as judged at the micro level of the daily activities, but it had lost its relevance for the average household in that community context. At a cost of several millions of dollars, the Club was rebuilt, this time with a proper Olympic-size pool to complement its aquatic, fee-bearing programs.

Concluding Thoughts

My goal in this paper has been to contribute to Urie Bronfenbrenner’s contextualist approach to human development by investigating what it means to study human development not only as it occurs at varying “levels of context,” and in different institutional settings, but over time scales that are appropriate to each contextual level.

I linked this inquiry to two methods that Urie proposed for including time in the study of persons developing in context: experiments by nature (periods of rapid, pervasive, social change such as those associated with technological change or government policies regulating college admissions) and experiments by design, in which the investigator seeks to understand development by changing the conditions under which it can occur and observing the consequences.

The 5thD began as a design experiment in this second sense. In its initial phase, it focused on creating a prototype activity based upon a set of theoretical principles derived from Vygotskian-inspired psychology regarding the conditions for promoting learning and development, taking into account the historical role of afterschool time in the lives of elementary school-age children. The apparent success of that prototype then resulted in an exploration of the viability of designs inspired by it when implemented in conditions where their effectiveness might be properly evaluated. Did it work?

In the early stages of the research, the 5thD differed from other design experiments of that early era (such as Brown and Campi-
one’s [1990] “community of learners”) only in so far as it made exploration of multiple contexts for implementation of the designed activity a part of the design from the start. Consistent with our contextualist, activity centered approach, we were not looking for uniformity of implementation. We assumed that every 5thD would differ in how the basic design principles were realized. It was precisely the (necessarily variable!) process of coconstructing of the “text” (the 5thD activity) and its con-texts (clubs, libraries, churches, schools after school, etc.) that we wanted to study.

During this phase of the research, time entered into our analysis of the process primarily at the microgenetic scale of human interactions, episodes that lasted from a few minutes to a half hour or more. This is the scale appropriate to recording and evaluating the various problem-solving activities of young children and undergraduates engaging each other in culturally organized, playful problem solving. This is also the time scale appropriate for administering developmental assessment tools, in the form of specially designed tasks that served as tests for assessing the efficacy of the 5thD. Although the possibilities and adequacy of such evaluations varied from site to site, the data consistently supported our intuitive impression that the activities were in fact successful in achieving the goal of restructuring the environment, producing a new configuration of activities, and enhancing children’s after-school learning (Cole & The Distributed Literacy Consortium, 2006, in particular chapters 5 and 6).

Despite the passage of only 3 years in this phase, the fragility of the 5thD was a documented fact that had to be confronted. We had established pretty clearly that a valued activity did not have to lose funding to be abandoned. An experiment by nature (national panic over child abuse) terminated the Childcare Center’s short implementation. The demise of the Library 5thD, despite its technical superiority in terms of professional assessment, forced us to confront the fact that for some plausible institutions, the implementation of the activities runs afoul of a thicket of bureaucratic rules that implicate questions such as child safety and accountability that can devalue the activity from the perspective of local staff and administrators. And while we initially had to adjust to the shock of continuing the activity at UCSD after the initial research monies ended, the Youth Club provided a valuable “home base” in which to develop both our theory and our practice. The Club provided the time, space, and freedom of action, that enabled us figure out how to develop both our theory and our practice. The Club provided the youth with the opportunity to participate in the activities outside of the school setting. The Club provided the youth with the opportunity to participate in the activities outside of the school setting.

During this phase of the research, which greatly expanded the number of investigators in different locales recreating their local version of the 5thD, all using the Youth Club 5thD as a working prototype for local modification, there was a continuing focus on the microgenetic processes occurring within the local activities, complemented by active efforts to work with community partners to assess the factors that promoted or impeded the development of the meso and exosystems.

This expansion of activity/institutional context combinations revealed both potentials for growth and life-threatening complexities in our design that were not in evidence during the first round of implementations. To begin with, we now encountered implementations that started out with great enthusiasm, were successful in the researchers’ terms as developmental psychologists, but were rejected by the host institution because the practices of the 5thD, such as encouraging mixed gender groups, informal child-adult interactions, and active sharing of information, were antithetical to their ideas about culturally acceptable behavior. Homologically, in one university that initially encouraged faculty participation in a local 5thD project and gave the program an outstanding achievement award, senior faculty began actively to discourage junior faculty involvement because the work was so difficult to implement as a randomized experiment. Junior faculty were encouraged to abandon the project to save their own careers. These experiences drove home the oft-forgotten point that when designing for development, the activities are infused with cultural values which are not always widely shared across different parts of the U.S. population.

The added number of cases now made it possible to discern an arc in the development of 5thD projects akin to the arc of a human life, as our initial idea of studying the life course of designed activities had indeed assumed. Many potential U-C Links programs which share the same underlying design structure as the 5thD have failed to get to the point of actually implementing the program (as was the case with the school system in our initial implementation). Others go through an initial period of hard work and joint planning, which, if it does not lead to immediate failure upon implementation, is followed by a period of enthusiasm about the success of the system. (Years later Seymour Sarason noted this phase of creating a setting when he remarked that during its period of success, the project “was for everyone in it a personal, intellectual, and professional joyride, and it was so regarded by others in the nascent field of community psychology.” Sarason, 2010, p. 176).

Once it is in place and working, however, implementers begin to experience strains arising from different parts of the system: The university, the community host institution, and the relationships between the two institutions begin to weigh heavily on the implementers, forcing unanticipated adjustments both to the way the activity is conducted and to how (and whether) coordination of resources for its continuation is worked out among the partners.

This phase of the experiment provided evidence that forces that operate as “experiments by nature” with respect to one system may have much more muted effects with respect to others. For example, several of the systems that lasted 4–5 years, especially those that were located on school grounds, were devastated by the No Child Left Behind Law of 2001, whereas others, such as the Youth Club, experienced only moderate levels of pressure to increase academic content. (Nocon & Cole, 2006).

The third phase of the project, which began when UC Links became its institutionalized umbrella and it still in progress, raised entirely new questions about how best to conceive of sustainability. When the 5thD became the inspiration for a greatly expanded number of similarly conceived and implemented afterschool university-community partnerships, the resulting programs were of such diversity with respect to the age, social class, and ethnic backgrounds of the communities involved that one could no longer speak of “sustaining the 5th Dimension.” Rather, what have been sustained and elaborated upon are the following:

1. A form of activity based on a common set of basic psycho-educational, social sciences principles (e.g., emphasis on local culture and context, rich and varied sources of motivation, an intergenerational participation structure that en-
courage engaged participation, and an emphasis on multiple, varied modes of communication) and;

2. Institutional mechanisms for coordinating interorganizational (University-Community Institution) collaboration that can support the routine implementation of the activity.

How long this larger, more institutionalized and coordinated structure of afterschool activities will last is, of course, as uncertain as the history I have just recounted. Contextual, cultural-historical factors, we can be certain, will play a significant role in all future development(s).

Because it existed for so long, and because we were dedicated to keeping track not only of interactions that occurred within the 5thD but also of significant events in the organization of its mesosystems and exosystems, the Youth Club 5thD permitted us to experience and document the ebb and flow of the activity over extended periods of time. It was our direct involvement in the process of design and implementation as it was buffeted by the "large contextual factors" that drew our attention to those factors were. We tried to implement Sarason's injunction that researchers should be held responsible for what the "predictable problems would be." But, like the parents of children who have grown and moved far from home, we were encountering the challenges of a long lasting 5thD for the first time.

There is irony in the fact that it was I who decided that the quality of the 5thD and the ongoing strains to staff at both the Youth Club and LCHC were sufficiently unfavorable to warrant discontinuing the experiment. And there is irony, too, in the fact that the hugely destructive Iraq war should lead unexpectedly to the fulfillment of our partnership’s initial plans for a fully functioning 5thD at the Club with 50–50 responsibility and a working inclusion of the 5thD in the Club’s administrative functioning. Factors were at work that are visible only in retrospect. However, the pie charts representing the observations of the undergraduates reveal that such far distant macrosystemic events were evident in the time at the quality of interactions in the 5thD microsystem.

The historical changes provoking the closing of the Youth Club 5thD illustrate the importance of tracing the process of its development over its entire life span, including its demise. This case illustrates a general methodological problem that faces all design research: contextual factors that are of central importance to maintaining the designed activity go undetected because they are changing on different time scales than the focal activity. The rising housing prices were experienced by the adult implementers, both at the Club and at LCHC, like the warming of the water to a frog that doesn’t recognize that it is about to be boiled.

Preoccupied with the daily business of partnering with Club staff to implement the 5thD, adjusting schedules of the University and Community organizations, creating new activities for the 5thD to keep up with rapidly changing digital technologies, the researchers were blind to systemic threats that became evident retrospectively. Only when what is later identified as a contextual factor (changing housing prices) breaks into the routine of the daily activity does it suddenly, as if from nowhere, become visible.

For example, we failed to keep track of the strains the Youth Club itself was undergoing in terms of its ability to attract local children and sustain its own funding base. Nor did we properly appreciate the fact that as the years went by new people moved into positions of responsibility in the Club. Once full partners, the upper administration of the Club had moved to a newly built facility nearby. Consequently, once-solid connections among people with a shared history of mutual aid were replaced by more formal relations and memoranda of understanding. These people did not have to become involved with the 5thD precisely because it was running so well.

From follow-up interviews with staff and administrators several years after the Club had begun to function in its new form, it became clear that when the Administration of the regional Clubs decided to remodel the Club, they considered the 5thD part of "the old way of doing things" that was focused on drop-in programming for which only nominal fees were required. The parents arriving in the community no longer wanted such drop-in programming. They could well afford college tutors if they thought their children needed academic enrichment, and there were plenty of sports programs around to keep their children busy after school. However, they could not afford an Olympic-sized swimming pool, although they could pay the fees needed to support the Club to provide one in its new mode of operation.

Moreover, the Club could use the profits from their successful swimming program to sponsor a new branch in the Latino barrio of the town, thereby reaching a part of the local population among whom drop-in programs and homework assistance were a welcome addition. The 5thD had become irrelevant.

Although perhaps regrettable for those under the illusion that designed activities, unlike humans, can live forever, the 18-year life span in the Youth Club provided us with a rare opportunity to trace out the implications of Urie Bronfenbrenner’s ideas about a contextualist approach to experiment by design.

Having placed ourselves at the center of Urie’s iconic matrochki we were able to experience first-hand a great many of the time scales of development which we could identify as the cause of wear and tear on our own development. We experienced the development of a designed activity, and we lived the process of its development in contexts which were themselves changing.

To end this account on an upbeat note, the progeny of the 5thD have continued to multiply in the years since its demise at its site of origin a decade ago. The statewide UClinks program continues to grow in a number of sites, undergraduates continue to be involved in afterschool programs based on the general principles of the activity’s original design. In the past decade, some 40,000 elementary schoolchildren and youth have benefited from such participation. This still-developing program is now a multigenerational cultural practice, one that is becoming part of the history within which it was created.

References


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