Reconsidering qualitative and quantitative research approaches: A cognitive developmental perspective

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Abstract

Rather than embracing the notion that contextualism requires purely qualitative methodologies, Westerman and Yanchar argue that there is a place for quantification in post-positivist research. Both authors provide compelling arguments for this position. From our cognitive developmental perspective, we see this as a move toward a new level of integration in psychology. Whereas reactive shifts between positivist quantification and radical contextualism exemplify the kind of pendulum swing we see in individual development immediately before the emergence of a new developmental level, the moves suggested by Westerman and Yanchar are in the direction of a qualitative shift—a new level of differentiation and integration. We argue that the arguments put forward by Westerman and Yanchar do not quite achieve consolidation at this new level, because they remain embedded in a post-positivist contextualism that demands an *a priori* rejection of psychological universals and strong forms of quantification. In our view, consolidation at this new level requires a shift to a *problem-focused methodological pluralism* that assimilates a wide range of methodological approaches, critiques them, and adapts them in light of the problems researchers seek to solve.
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1. Introduction

Both Westerman (2006) and Yanchar (2006) frame their discussions of quantitative methods by considering the question of whether there is a place for quantitative methods in a post-positivist reconstruction of psychology. Their arguments move toward a view that integrates qualitative and quantitative research in a new synthesis. Underlying the perspectives of both authors is the assumption that positivist approaches to psychological inquiry are fundamentally reductionistic, universalizing, and empty, and therefore offer little of value. The post-positivists, on the other hand, are viewed as properly embracing contextualism as the solution to the fatal limitations of the positivist agenda, replacing quantitative methods with rich, contextualized, qualitative accounts of psychological phenomena.

Interestingly, however, rather than embracing the notion that contextualism requires purely qualitative methodologies, Westerman and Yanchar argue that there is a place for quantification in post-positivist research. Both authors provide compelling arguments for this position and suggest a number of means for achieving this marriage. From our cognitive developmental perspective, we see this as a move toward a new level of integration in psychology. Whereas reactive shifts between positivist quantification and radical contextualism exemplify the kind of pendulum swing we see in individual development immediately before the emergence of a new developmental level, the moves suggested by Westerman and Yanchar are in the direction of a qualitative shift—a new developmental level, a new level of differentiation and integration.

In this response, we: (1) elaborate our argument that Westerman and Yanchar are moving toward a new level of differentiation and integration in psychology. This involves suggesting that there are parallels between individual and paradigmatic developmental processes. Then we: (2) suggest that the approaches of Westerman and Yanchar do not fully achieve the higher level of integration they aim for. This involves examining the form of the integrations they propose and finding that, much of the time, some methodological approaches are unduly marginalized, while others are incorporated only after being truncated. Along the way we: (3) offer a somewhat different perspective on what a new psychology might look like—one that strives for a complete integration of what researchers have learned from both positivist and post-positivist perspectives. We suggest that researchers should adopt a *problem-focused methodological pluralism* in which divisive theoretical alliances are overcome in the quest for usable knowledge. Instead of privileging qualitative or quantitative methods a priori, researchers need to carefully fit the questions they pose to the most appropriate methods for addressing them—sometimes qualitative, sometimes quantitative, often a combination of qualitative and quantitative.

2. Developmental transitions: parallels between individual and paradigmatic development

Developmental levels, also referred to here as *complexity levels,* are commonly understood as a series of hierarchical integrations of knowledge structures. Many developmental theories employ the notion of hierarchical complexity. In the Piagetian model, for example, each successive hierarchical integration produces novel understandings by employing the operations of the previous order as conceptual elements in its new constructions. This notion is central to several other developmental theories as well, including those of Werner (1948), Case (1985), and Fischer (1980), and underlies various developmental scales, such as the levels and tiers of Fischer's skill theory, the complexity

orders of the General Stage Model (Commons, Trudeau, Stein, Richards, & Krause, 1998), and the complexity levels of the Lectical[TM] Assessment System (LAS) (Dawson, 2006).

A number of researchers have focused on the nature of developmental transitions. These are variously characterized in terms of disequilibration (Piaget, 1985), movement toward dominance of higher order structures (Walker, Gustafson, & Hennig, 2001), vacillation between competing structures (Granott & Parziale, 2002), periods of relatively rapid change (Dawson-Tunik, Commons, Wilson, & Fischer, 2005), or catastrophes (van der Maas & Molenaar, 1995). Common to all these characterizations is agreement that transitions are unstable relative to periods of consolidation at a new modal level. In our research on transitions we have observed that during the consolidation phase of a complexity level individuals follow a regular progression: (1) They extend the structures of the new level to an ever wider range of content, developing strategies that are bounded by these structures. As knowledge is increasingly elaborated at this new complexity level, however, individuals are likely to (2) come up against the limitations of particular strategies; (3) reject them; and (4) devise alternative strategies—at the same complexity level—that overcome the limitations of the original strategies. They will then (5) exercise the new strategies; and, ultimately, (6) come up against the limitations of these strategies. At this point, they may (7) notice that some of the limitations of the new strategies can be addressed by the original strategies. If so, individuals may (8a) begin to vacillate between strategies and/or (8b) attempt to integrate aspects of the original strategies into the newer strategies. From a cognitive developmental point-of-view, steps (8a) and (8b) mark a fundamental transition process, which we call *co-occurrence* or *shift of focus* between strategies or skills and which have been described by various developmental researchers (Fischer, 1980; Goldin-Meadow, Alibali, & Church, 1993; Gottlieb, Gottlieb, Taylor, & Ruderman, 1977; Granott & Parziale, 2002; Roberts, 1981; van Geert, 2000).

A concrete example from our leadership research should make this process clearer (Dawson-Tunik & Stein, 2004; Dawson-Tunik & Stein, manuscript submitted for publication). In adolescence, most people begin to construct what we call abstract mappings, in which they at first coordinate abstract concepts in simple linear logical relations. As adolescents and adults develop, they move from simple abstract mappings to more complex abstract mappings, creating multiple mappings and elaborating them, eventually to a highly elaborated state, until finally they move to a qualitatively new level called abstract systems. This progression results in interesting developmental patterns. For example, at the abstract mappings level, individuals often respond to workplace dilemmas that involve the competing claims of their organization and an individual within their organization by focusing on either the needs of the individual or the organization.

In one government agency, most individuals who were performing at the level we call *elaborated* abstract mappings (not yet highly elaborated) focused almost exclusively on the needs of their organization. Individuals performing at *highly* elaborated abstract mappings showed a different pattern. Having experienced the limitations of taking the perspective of the organization, they often took the perspective of the individual. Those performing in the transition between abstract mappings and abstract systems either vacillated between these two positions or began to assert that a better solution would allow them to take both perspectives into account. For example, one respondent declared that there had to be some way to figure out how to support people and the organization at the same time, and provided a solution in which the protagonist of a workplace dilemma could get some of her personal needs met without disrupting the organization. The more fully integrated

argument, indicating how a good leader can generally find solutions that balance the needs of individuals with those of the organization, was not seen until the qualitative movement to the subsequent level, which we call abstract systems.

The preceding discussion highlights ubiquitous developmental patterns: (1) the deep-structural pattern of *hierarchical integration*, and (2) the oscillations and shifts of focus between competing conceptions and strategies that occur during transitions between levels. These phenomena have been demonstrated to exist in individuals. We think it is reasonable to hypothesize that analogous patterns occur in the development of discourses. Of course, we do not claim that the positivist and post-positivist discourses are at abstract mappings. In fact, we do not attempt to identify the developmental level of these discourses. Such an endeavor, given the heterogeneity of discourses of this kind, would be complex, involving multiple levels and conceptual strands; and any brief treatment would be simplistic. What
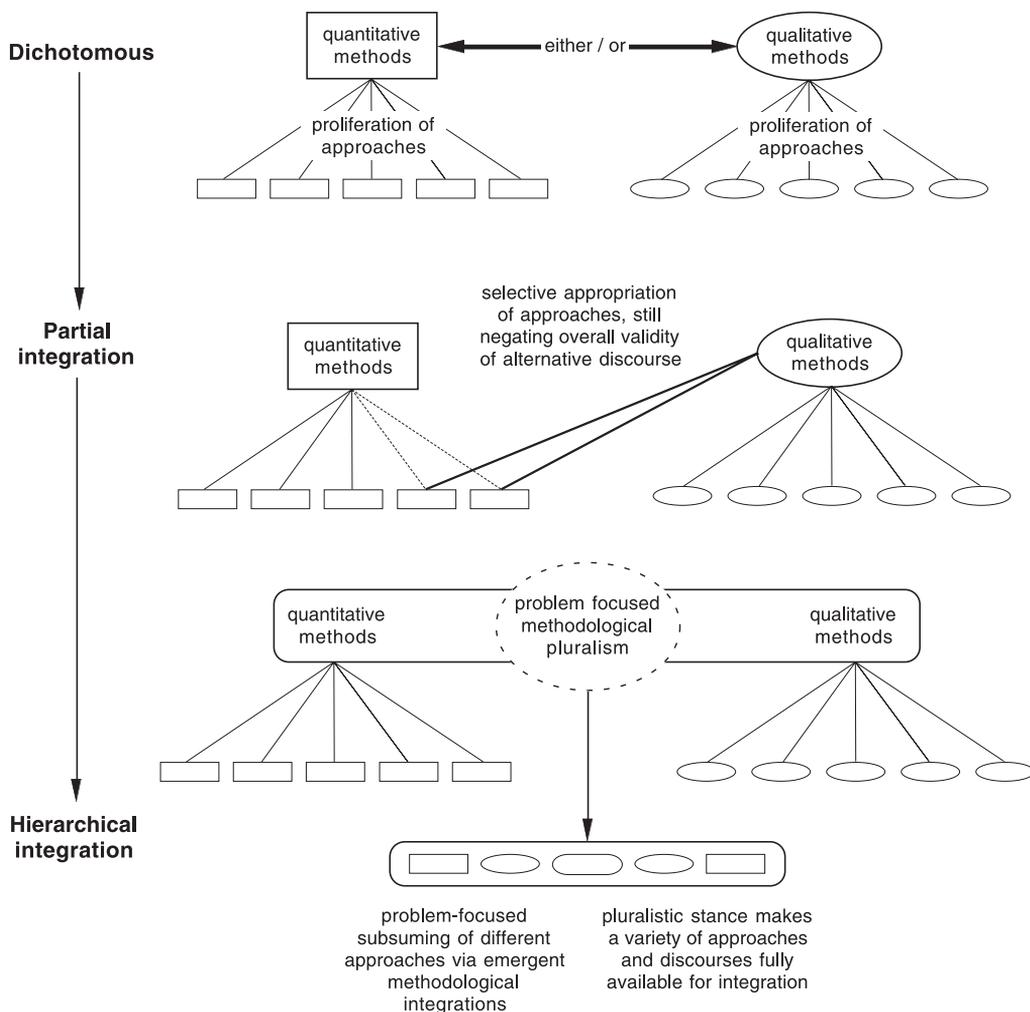

Fig. 1.

we are claiming here is that the development of theoretical discourses appears to follow developmental patterns that are similar to those observed in cognition. Baldwin (1906/ 1975), Piaget and Garcia (1989), and Habermas (1984), among others, have made similar claims regarding the development of worldviews, theoretical discourses, and methodological approaches; all pointing to a process of differentiation and integration like the one described above. To cite a more recent example, Nersessian (2002) has applied a cognitive developmental lens to understanding major conceptual shifts in physics.

Fig. 1 portrays a schematic representation of the view we are suggesting. It helps clarify the shifts of focus and vacillations between strategies that signify transitions between levels and the hierarchical integrations that signify the emergence of new levels. This schematic should help to clarify the type of integration we are espousing when talking about *a new level of integration*. It also helps to make explicit in what direction we feel the progress of psychology lies. In what follows, we will use this developmental perspective to assess the methodological integrations suggested by Westerman and Yanchar. During this discussion, we will offer examples of research efforts that carry out a program of integration that builds on and, we propose, goes beyond the one outlined by Westerman and Yanchar.

3. The integration suggested by Westerman and Yanchar

In light of this developmental perspective, the integration of quantitative methods into the post-positivist contextualist paradigm, as proposed by Westerman and Yanchar, exemplifies a transitional phenomenon. Both authors embrace the post-modernist critique of psychological positivism. Both authors reject the search for abstract universals, decontextualized experimental designs, and classical definitions of measurement—all of which are mainstays of positivist psychology. Westerman suggests that we discard conventional approaches to quantification and develop theories and research designs that intentionally embed interpretation in quantification. Yanchar suggests that we consider moving from thinking about self-contained variables to dynamic modes, from measurement to interpretation, from internal validity to trustworthiness, from generalizability to transfer. We applaud most of these specific proposals, but suggest that a broader approach is required in which qualitative and quantitative methods are more fully integrated, with choices depending upon the match between research questions and the strengths and limitations of each method. Both Westerman and Yanchar are willing to accept some quantitative methods into their interpretive frameworks, but they still broadly reject many quantitative methods that have legitimate strengths for particular questions. Neither qualitative nor quantitative methods should be privileged a priori.

In general, methodological approaches can be characterized in terms of the scope of the questions they address. In any paradigm there are constraints on the types of research questions that are deemed legitimate. A radical positivist thinks of hypothesis testing as the only legitimate approach to psychological science. A radical post-positivist thinks that ethnography is the only legitimate approach. No doubt, Westerman and Yanchar pose fewer methodological constraints than radical proponents of either side. However, the question is: do the constraints suggested by Westerman and Yanchar lead to a higher-level integration of qualitative and quantitative approaches as portrayed in Fig. 1? To address this question, we examine some of the methodological constraints suggested by Westerman and Yanchar.

First, both authors advocate using only those quantitative methods that are compatible with contextually sensitive theories and research models. Such a methodological constraint appears to truncate the scope of quantitative methods by demanding they be closely aligned with qualitative ones, revealing a lack of real differentiation between the two kinds of methods (see level 2 of Fig. 1.) It is evident to us that usable knowledge in psychology often emerges from the convergence of evidence gleaned from very different research methods—methods that may, on ideological grounds, seem incompatible. For example, the specification of developmental levels came initially from qualitative analyses of big changes, then quantitative assessments of discontinuities. Eventually, the convergence of methods showed parallel patterns of change in scales, behavior quality, and brain function (Fischer & Bidell, 2006). The methods required to achieve our current state of knowledge about development has incorporated a number of qualitative and quantitative methods, including everything from naturalistic observations (Piaget, 1926; Vygotsky, 1986) to brain studies (Saxe, Carey, & Kanwisher, 2004; Stauder, Molenaar, & Van der Molen, 1999). Just as importantly, the researchers who have contributed to building this knowledge have examined development from a number of different frames of reference. Progress resulted from an integration of results from research informed by *fully differentiated* methodologies. Had approaches such as naturalistic observations and studies of brain functioning been deemed irrelevant or been constrained a priori, the complex perspective that results from their integration would not have emerged. Partial integrations necessarily create partial pictures—pictures that are one-dimensional, less convincing, and consequently, have less practical bearing. Of course, they also set the groundwork for the fuller integrations that must ultimately be constructed.

Note that integrating fully differentiated methodologies does not entail accepting pre-given approaches uncritically. The nature of the problem shapes the manner in which various methodologies are to be adopted. For example, we have shown how the quantitative techniques of Rasch scaling can be used not only to calibrate test items (their usual use) but to test the stage-like quality of developmental transitions (Dawson-Tunik, 2004, in press). Such problem-focused assimilation of methodologies differs from paradigm-focused assimilation, which fits quantitative methods into qualitative frameworks or vice versa independent of the nature of particular problems and questions.

Second, both Westerman and Yanchar appear to have little use for psychological universals, but we suggest that some psychological universals might be identified and employed to enrich our understanding of human psychology in important ways. Again what is at issue is allowing a variety of approaches to be fully differentiated before integrations are attempted. We are suggesting that methodologies should not constrain one another, with some being unduly marginalized. Instead, we suggest that in order to take full advantage of each approach its proper scope should be determined by the context of its application (e.g. the problem at hand, and the other methodologies being brought to bear). It seems clear that psychological universals have a role to play, even in research that is context-sensitive. For instance, Fischer (1980) describes a developmental sequence of increasingly complex skills that characterizes development in a range of cognitive domains. This sequence, which lies at the core of *skill theory*, provides useful tools for analyzing developmental processes, learning, teaching, and child–environment interactions (Fischer & Bidell, 2006). The sequence is simultaneously qualitative and quantitative as well as universal and context-specific. It specifies qualitative changes in the organization of action in development and learning in specific contexts—changes that can be ordered along

a quantitative scale. Furthermore, the scale applies universally—to all kinds of learning and skill development—and at the same time it is context-specific, always realized in a particular context with skills specific to that context. That is, it provides a ruler for analyzing and assessing qualitative changes in development and learning in any domain, and each actual development or learning sequence is context-specific, characterized by skills that the person constructs for a particular context.

Dawson's methodology, *developmental maieutics* (Dawson-Tunik, 2004, in press), represents a deliberate marriage of universal with contextual and qualitative with quantitative. She and her colleagues subject texts to multiple forms of analysis, some of which lead to quantification, others of which lead to rich qualitative descriptions of pathways of conceptual development. Employing a context-independent developmental ruler based on skill theory (Fischer, 1980) and the general stage model (Commons et al., 1998), Dawson and her colleagues score texts (interviews, essays, speeches, spontaneous utterances, etc.) representing a range of developmental levels for their complexity (skill) level. She also submits these texts to fine-grained conceptual analyses, designed to identify all of the relevant conceptual elements embedded in each text. Identified concepts are then arranged in a matrix by the developmental levels at which they appear, and this matrix is employed along with the original texts to construct an account of conceptual development. Dawson and her colleagues have repeatedly demonstrated that the developmental ruler taps a universal and quantifiable developmental sequence (Dawson-Tunik et al., 2005), and at the same time the accounts of conceptual development they produce—accounts that could not be constructed without the ruler—reveal important individual, contextual, and cultural differences.

A second example of the interplay between the contextual and the universal comes from research in emotional development. Basic emotions, such as anger, shame, sadness, or love, are mostly universal, but they are shaped by culture in important ways (Tangney & Fischer, 1995). For example, cultures can suppress or enhance whole families of emotions, as in the case of shame—a valued and differentiated emotion in Chinese culture, an avoided and undifferentiated emotion in Western culture (Li, Wang, & Fischer, 2004; Menon & Shweder, 1994; Tangney & Fischer, 1995). An emotion like shame can thus be simultaneously universal and culture specific. It is universal in that it is characteristic of the emotional life of human beings as members of the species *Homo sapiens*, and at the same time it is shaped powerfully by the individual person's culture and experience. Interestingly, emotions also have been shown to change with development (Case, 1988; Fischer, Shaver, & Carnochan, 1990), making it clear that an adequate account of emotions must integrate universal, contextual, and developmental dimensions.

Third, both authors prefer "soft" forms of measurement to "strong" forms that align themselves with the classical, mathematical view of measurement as unidimensional, calibrated, and having interval properties. This methodological constraint, like the previous ones, recoils from a fully elaborated methodological pluralism. Although we agree that soft forms of measurement are useful for addressing some psychological questions, as in the early work specifying developmental sequences and levels, we think strong measures can also be employed to meaningfully address many important psychological questions. Dawson and colleagues (Dawson, 2003, 2004; Dawson & Gabrielian, 2003) have demonstrated that a well-calibrated developmental "ruler" can be employed to describe richer and more informative accounts of conceptual development than those described with strictly qualitative methods. In early developmental research, sequences were constructed

through an entirely qualitative "bootstrapping" process that integrated developmental theory with longitudinal observation (Armon, 1984; Colby & Kohlberg, 1987; Fischer & Bullock, 1981). The resulting developmental sequences consisted of descriptions of reasoning within a given domain at different developmental levels. These were necessarily constrained by the make-up of the longitudinal samples from which the descriptions were drawn. Moreover, particular conceptions tended to become reified as "stage" definitions. Four major problems emerged. First, it became possible to argue that a person was at a stage because he or she expressed a particular concept while simultaneously holding that the person was able to express the concept because they were at a particular stage— a problematic circular argument. Second, concepts that were not incorporated in stage descriptions were not easily assigned to developmental levels. Third, the small, often homogeneous sample sizes that were commonly selected for longitudinal study led to accusations of bias. Finally, these scales made it impossible to study cultural differences in concept development without developing a new scale in each culture.

A content-independent, universal measure of developmental level, like the skill hierarchy (Fischer, 1980) and the closely related Lectical[TM] Assessment System (LAS) (Dawson, 2006), solves all of these problems, by making it possible simultaneously to measure the developmental level of a performance on the one hand and to study its conceptual content on the other. The results are rich, contextually specific *descriptions* of reasoning at different developmental levels in a range of knowledge domains that can reasonably be compared with one another—without begging the question of the relation between the developmental level of performances and their content. Thus, a strong measure, coupled with qualitative analysis, out-performs a purely qualitative approach (or a purely quantitative one) to examining developmental differences.

Fourth, and finally, both Westerman and Yanchar eschew decontextualized experimental designs, but we wonder if this might not be a case of throwing out the baby with the bathwater. Certainly, social scientists have learned much of value from this kind of research[1]. For example, Piaget's (1954) original naturalistic observations of his children's emerging knowledge of object permanence was followed up with extensive clinical observations in experimental conditions that led to a much more nuanced account of the development of object permanence (Uzgiris & Hunt, 1987), providing psychologists with useful diagnostics for infant development, and parents with important insights into their children's developing minds. On a more general level, experimental and quasi-experimental studies like these contributed to the description of the general developmental scales (Case, 1991; Commons et al., 1998; Fischer, 1980) that formed the basis for content-independent scoring systems like the Lectical[TM] Assessment System.

In general this discussion has demonstrated how the integrations suggested by Westerman and Yanchar take some steps toward the *hierarchical integrations* that would lead to more adequate methodologies, but ultimately fall short. As mentioned above, their suggestions do overcome strict dichotomies (see level 1 of Fig. 1), and they have moved beyond the radical pendulum swings that occur before integrations can be considered. Indeed, Westerman and Yanchar propose a response indicative of the beginnings of a real developmental transition period, characterized by an awareness that we need to move past either/or choices. However, they do not fully elaborate and differentiate the approaches

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[1]One could argue that contextualism would not have emerged without extensive attempts to apply a strict version of the scientific method in psychology.

they intend to bring together. Instead of constraining methodological approaches in light of the demands of problems, they constrain quantitative approaches in light of de facto commitments to qualitative ones (see level 2 of Fig. 1). Because of this they truncate the potential contributions of universalistic, quantitative, and de-contextualized methodological approaches. This marginalization of valid perspectives seems to contradict their integrative intentions. As a foil to their suggestions we have reviewed some research efforts that subsume diverse approaches by critically integrating them in light of the context of their use (e.g. a problem at hand, and the use of several methodologies to address it; see level 3 of Fig. 1).

4. Moving to the next level

All the research examples in the previous section have one thing in common: They exemplify *problem-focused methodological pluralism*, blending methods from the positivist and post-positivist traditions in creative ways to address important research questions that have produced usable knowledge. This research moves beyond the ideologies that underlie these traditions. It uses nuanced, contextualized accounts of psychological processes and enriches these accounts by employing tools (both qualitative and quantitative) that are constrained by only one thing—the value of those tools for addressing the research questions. Moreover, there is no conflict between the search for universals and the need to understand psychological phenomena in context. Universals are used to expose the contextual, and contextual analyses are used to illuminate and delimit universals, producing richer and more useful knowledge than otherwise would be possible. The research shifts contexts to test the validity of universals, sharpening measures to tease out the effects of contexts. Perhaps, most importantly, one type of research is not privileged over another, except to the extent that one method allows researchers to address a question head on and another does not. In the best situation of all, researchers use several different methods that can address the same question, resulting in a convergence of perspectives.

We argue that this kind of problem-focused methodological pluralism more fully carries out the integrative intentions suggested by Westerman and Yanchar. And so it is this approach that better characterizes a qualitatively new level of psychological investigation—one transcending but including previously differentiated methodological approaches. Realization of this pluralism requires careful, critical analysis of methods in relation to research questions. It can function only when methodologies are critiqued, revised, and sometimes discarded. Which methodologies deserve what treatment is decided in the practice of using them to attempt to address questions. Since the decline of positivism we rightfully mistrust overly simple empirical foundations and "views from nowhere" that neglect the importance of viewpoint. Simultaneously we also reject the opposite extreme of "hermeneutic idealism," which at its worst amounts to a counter-hegemony. Fortunately Westerman and Yanchar also reject these one-sided perspectives, but unfortunately many other researchers remain caught in them. Beyond these pseudo-certainties lies the pursuit of usable knowledge.

The kind of problem-focused methodological pluralism we espouse is far from both methodological eclecticism and grand synthesis. We argue only that problem-focused research efforts can catalyze creative methodological integrations, and the success of these integrations can be evaluated in light of the interests that generated them. No doubt, the problem-focused adoption of various methodological approaches takes place *in medias res*.

All such integrations are contingent. Aligning methods with problems insures that these integrations are not arbitrary, because the focus on addressing specific problems with a method leads to critical examination of its strengths and limitations for the specific problems. Relating and sometimes merging methods requires teasing apart the essential from the arbitrary or erroneous.

Going beyond the dichotomy between qualitative and quantitative demands a broader discourse concerning what constitutes good methods. Instead of asking whether quantitative methods are to be preferred over qualitative ones (or vice versa) we ask which methods have something to offer in light of the general goal of building usable knowledge. Problem-focused methodological pluralism requires assimilating a wide range of methodological approaches, critiquing them, and adapting them in light of the problems we seek to solve. This problem-focused orientation in effect contextualizes contextualism and universalism.

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