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New Ideas in Psychology ■ (■■■) ■■■-■■■

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9 **Reconsidering qualitative and quantitative research
11 approaches: A cognitive developmental perspective**

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17
19 **Abstract**



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23
25 **1. Introduction**

27 Both Westerman (2006) and Yanchar (2006) frame their discussions of quantitative
29 methods by considering the question of whether there is a place for quantitative methods in
31 a post-positivist reconstruction of psychology. Their arguments move toward a view that
33 integrates qualitative and quantitative research in a new synthesis. Underlying the
35 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.

37 Interestingly, however, rather than embracing the notion that contextualism requires
39 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
41 cognitive developmental perspective, we see this as a move toward a new level of

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1 integration in psychology. Whereas reactive shifts between positivist quantification and
 2 radical contextualism exemplify the kind of pendulum swing we see in individual
 3 development immediately before the emergence of a new developmental level, the moves
 4 suggested by Westerman and Yanchar are in the direction of a qualitative shift—a new
 5 developmental level, a new level of differentiation and integration.

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

21 **2. Developmental transitions: parallels between individual and paradigmatic development**

22
 23 Developmental levels, also referred to here as *complexity levels*, are commonly
 24 understood as a series of hierarchical integrations of knowledge structures. Many
 25 developmental theories employ the notion of hierarchical complexity. In the Piagetian
 26 model, for example, each successive hierarchical integration produces novel under-
 27 standings by employing the operations of the previous order as conceptual elements in its
 28 new constructions. This notion is central to several other developmental theories as well,
 29 including those of Werner (1948), Case (1985), and Fischer (1980), and underlies various
 30 developmental scales, such as the levels and tiers of Fischer's skill theory, the complexity
 31 orders of the General Stage Model (Commons, Trudeau, Stein, Richards, & Krause, 1998),
 32 and the complexity levels of the Lectical™ Assessment System (LAS) (Dawson, 2006).

A number of researchers have focused on the nature of developmental transitions. These
 35 are variously characterized in terms of disequibration (Piaget, 1985), movement toward
 36 dominance of higher order structures (Walker, Gustafson, & Hennig, 2001), vacillation
 37 between competing structures (Granott & Parziale, 2002), periods of relatively rapid
 38 change (Dawson-Tunik, Commons, Wilson, & Fischer, 2005), or catastrophes (van der
 39 Maas & Molenaar, 1995). Common to all these characterizations is agreement that
 40 transitions are unstable relative to periods of consolidation at a new modal level. In our
 41 research on transitions we have observed that during the consolidation phase of a
 42 complexity level individuals follow a regular progression: (1) They extend the structures of
 43 the new level to an ever wider range of content, developing strategies that are bounded by
 44 these structures. As knowledge is increasingly elaborated at this new complexity level,
 45 however, individuals are likely to (2) come up against the limitations of particular
 46 strategies; (3) reject them; and (4) devise alternative strategies—at the same complexity
 47 level—that overcome the limitations of the original strategies. They will then (5) exercise

1 the new strategies; and, ultimately, (6) come up against the limitations of these strategies.
 2 At this point, they may (7) notice that some of the limitations of the new strategies can be
 3 addressed by the original strategies. If so, individuals may (8a) begin to vacillate between
 4 strategies and/or (8b) attempt to integrate aspects of the original strategies into the newer
 5 strategies. From a cognitive developmental point-of-view, steps (8a) and (8b) mark a
 6 fundamental transition process, which we call *co-occurrence* or *shift of focus* between
 7 strategies or skills and which have been described by various developmental researchers
 8 (Fischer, 1980; Goldin-Meadow, Alibali, & Church, 1993; Gottlieb, Gottlieb, Taylor, &
 9 Ruderman, 1977; Granott & Parziale, 2002; Roberts, 1981; van Geert, 2000).

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

21 In one government agency, most individuals who were performing at the level we call
 22 *elaborated* abstract mappings (not yet highly elaborated) focused almost exclusively on the
 23 needs of their organization. Individuals performing at *highly* elaborated abstract mappings
 24 showed a different pattern. Having experienced the limitations of taking the perspective of
 25 the organization, they often took the perspective of the individual. Those performing in the
 26 transition between abstract mappings and abstract systems either vacillated between these
 27 two positions or began to assert that a better solution would allow them to take both
 28 perspectives into account. For example, one respondent declared that there had to be some
 29 way to figure out how to support people and the organization at the same time, and
 30 provided a solution in which the protagonist of a workplace dilemma could get some of her
 31 personal needs met without disrupting the organization. The more fully integrated
 32 argument, indicating how a good leader can generally find solutions that balance the needs
 33 of individuals with those of the organization, was not seen until the qualitative movement
 34 to the subsequent level, which we call abstract systems.

35 The preceding discussion highlights ubiquitous developmental patterns: (1) the deep-
 36 structural pattern of *hierarchical integration*, and (2) the oscillations and shifts of focus
 37 between competing conceptions and strategies that occur during transitions between levels.
 38 These phenomena have been demonstrated to exist in individuals. We think it is reasonable
 39 to hypothesize that analogous patterns occur in the development of discourses. Of course,
 40 we do not claim that the positivist and post positivist discourses are at abstract mappings.
 41 In fact, we do not attempt to identify the developmental level of these discourses. Such an
 42 endeavor, given the heterogeneity of discourses of this kind, would be complex, involving
 43 multiple levels and conceptual strands; and any brief treatment would be simplistic. What
 44 we are claiming here is that the development of theoretical discourses appears to follow
 45 developmental patterns that are similar to those observed in cognition. Baldwin (1906/
 46 1975), Piaget and Garcia (1989), and Habermas (1984), among others, have made similar
 47 claims regarding the development of worldviews, theoretical discourses, and methodolo-

1 gical approaches; all pointing to a process of differentiation and integration like the one
 2 described above. To cite a more recent example, Nersessian (2002) has applied a cognitive
 3 developmental lens to understanding major conceptual shifts in physics.

4 Fig. 1 portrays a schematic representation of the view we are suggesting. It helps clarify
 5 the shifts of focus and vacillations between strategies that signify transitions between levels
 6 and the hierarchical integrations that signify the emergence of new levels. This schematic
 7 should help to clarify the type of integration we are espousing when talking about a new
 8 level of integration. It also helps to make explicit in what direction we feel the progress of
 9 psychology lies. In what follows, we will use this developmental perspective to assess the
 10 methodological integrations suggested by Westerman and Yanchar. During this
 11 discussion, we will offer examples of research efforts that carry out a program of
 12 integration that builds on and, we propose, goes beyond the one outlined by Westerman
 13

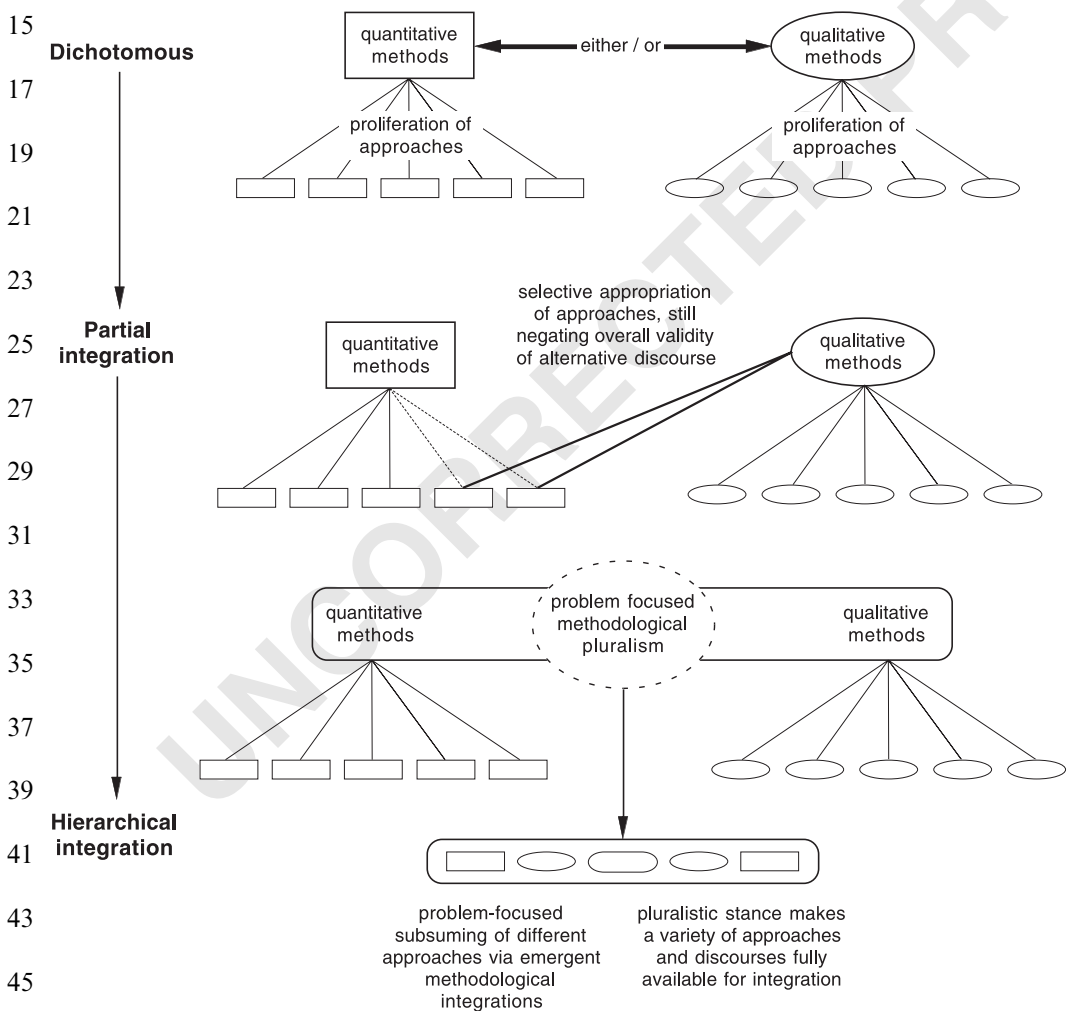


Fig. 1.

1 and Yanchar.

3 3. The integration suggested by Westerman and Yanchar

5 In light of this developmental perspective, the integration of quantitative methods into
the post-positivist contextualist paradigm, as proposed by Westerman and Yanchar,
7 exemplifies a transitional phenomenon. Both authors embrace the post-modernist critique
of psychological positivism. Both authors reject the search for abstract universals,
9 decontextualized experimental designs, and classical definitions of measurement—all of
which are mainstays of positivist psychology. Westerman suggests that we discard
11 conventional approaches to quantification and develop theories and research designs that
intentionally embed interpretation in quantification. Yanchar suggests that we consider
13 moving from thinking about self-contained variables to dynamic modes, from measure-
ment to interpretation, from internal validity to trustworthiness, from generalizability to
15 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
17 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
19 quantitative methods into their interpretive frameworks, but they still broadly reject many
quantitative methods that have legitimate strengths for particular questions. Neither
21 qualitative nor quantitative methods should be privileged a priori.

In general, methodological approaches can be characterized in terms of the scope of the
23 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
25 only legitimate approach to psychological science. A radical post-positivist thinks that
ethnography is the only legitimate approach. No doubt, Westerman and Yanchar pose
27 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
29 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
31 and Yanchar.

First, both authors advocate using only those quantitative methods that are compatible
33 with contextually sensitive theories and research models. Such a methodological constraint
appears to truncate the scope of quantitative methods by demanding they be closely
35 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
37 often emerges from the convergence of evidence gleaned from very different research
methods—methods that may, on ideological grounds, seem incompatible. For example,
39 the specification of developmental levels came initially from qualitative analyses of big
changes, then quantitative assessments of discontinuities. Eventually, the convergence of
41 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
43 about development has incorporated a number of qualitative and quantitative methods,
including everything from naturalistic observations (Piaget, 1926; Vygotsky, 1986) to brain
45 studies (Saxe, Carey, & Kanwisher, 2004; Stauder, Molenaar, & Van der Molen, 1999).
Just as importantly, the researchers who have contributed to building this knowledge have
47 examined development from a number of different frames of reference. Progress resulted

1 from an integration of results from research informed by *fully differentiated* methodol-
 2 ogies. Had approaches such as naturalistic observations and studies of brain functioning
 3 been deemed irrelevant or been constrained a priori, the complex perspective that results
 4 from their integration would not have emerged. Partial integrations necessarily create
 5 partial pictures—pictures that are one-dimensional, less convincing, and consequently,
 6 have less practical bearing. Of course, they also set the groundwork for the fuller
 7 integrations that must ultimately be constructed.

8 Note that integrating fully differentiated methodologies does not entail accepting pre-
 9 given approaches uncritically. The nature of the problem shapes the manner in which
 10 various methodologies are to be adopted. For example, we have shown how the
 11 quantitative techniques of Rasch scaling can be used not only to calibrate test items (their
 12 usual use) but to test the stage-like quality of developmental transitions (Dawson-Tunik,
 13 2004, in press). Such problem-focused assimilation of methodologies differs from
 14 paradigm-focused assimilation, which fits quantitative methods into qualitative frame-
 15 works or vice versa independent of the nature of particular problems and questions.

16 Second, both Westerman and Yanchar appear to have little use for psychological
 17 universals, but we suggest that some psychological universals might be identified and
 18 employed to enrich our understanding of human psychology in important ways. Again
 19 what is at issue is allowing for a variety of approaches to be fully differentiated before
 20 integrations are attempted. We are suggesting that methodologies should not constrain one
 21 another, with some being unduly marginalized. Instead, we suggest that in order to take
 22 full advantage of each approach its proper scope should be determined by the context of its
 23 application (e.g. the problem at hand, and the other methodologies being brought to bear).
 24 It seems clear that psychological universals have a role to play, even in research that is
 25 context-sensitive. For instance, Fischer (1980) describes a developmental sequence of
 26 increasingly complex skills that characterizes development in a range of cognitive domains.
 27 This sequence, which lies at the core of *skill theory*, provides useful tools for analyzing
 28 developmental processes, learning, teaching, and child–environment interactions (Fischer
 29 & Bidell, 2006). The sequence is simultaneously qualitative and quantitative as well as
 30 universal and context-specific. It specifies qualitative changes in the organization of action
 31 in development and learning in specific contexts—changes that simultaneously can be
 32 ordered along a quantitative scale. Furthermore, that scale applies universally—to all
 33 kinds of learning and skill development—and at the same time it is context-specific, always
 34 realized in a particular context with skills specific to that context. That is, it provides a
 35 ruler for analyzing and assessing qualitative changes in development and learning in any
 36 domain, and each actual development or learning sequence is context-specific,
 37 characterized by skills that the person constructs for a particular context.

38 Dawson's methodology, *developmental maieutics* (Dawson-Tunik, 2004, in press),
 39 represents a deliberate marriage of universal with contextual and qualitative with
 40 quantitative. She and her colleagues subject texts to multiple forms of analysis, some of
 41 which lead to quantification, others of which lead to rich qualitative descriptions of
 42 pathways of conceptual development. Employing a context-independent developmental
 43 ruler based on skill theory (Fischer, 1980) and the general stage model (Commons et al.,
 44 1998), Dawson and her colleagues score texts (interviews, essays, speeches, spontaneous
 45 utterances, etc.) representing a range of developmental levels for their complexity (skill)
 46 level. She also submits these texts to fine-grained conceptual analyses, designed to identify
 47 all of the relevant conceptual elements embedded in each text. Identified concepts are then

1 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.
 3 Dawson and her colleagues have repeatedly demonstrated that the developmental ruler
 taps a universal and quantifiable developmental sequence (Dawson-Tunik et al., 2005), and
 5 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
 7 cultural differences.

A second example of the interplay between the contextual and the universal comes from
 9 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 &
 11 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
 13 avoided and undifferentiated emotion in Western culture (Li, Wang, & Fischer, 2004;
 Menon & Shweder, 1994; Tangney & Fischer, 1995). An emotion like shame can thus be
 15 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
 17 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;
 19 Fischer, Shaver, & Carnochan, 1990), making it clear that an adequate account of
 emotions must integrate universal, contextual, and developmental dimensions.

21 Third, both authors prefer “soft” forms of measurement to “strong” forms that align
 themselves with the classical, mathematical view of measurement as unidimensional,
 23 calibrated, and having interval properties. This methodological constraint, like the
 previous ones, recoils from a fully elaborated methodological pluralism. Although we
 25 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
 27 strong measures can also be employed to meaningfully address many important
 psychological questions. Dawson and colleagues (Dawson, 2003, 2004; Dawson &
 29 Gabrielian, 2003) have demonstrated that a well-calibrated developmental “ruler” can be
 employed to describe richer and more informative accounts of conceptual development
 31 than those described with strictly qualitative methods. In early developmental research,
 sequences were constructed through an entirely qualitative “bootstrapping” process that
 33 integrated developmental theory with longitudinal observation (Armon, 1984; Colby &
 Kohlberg, 1987; Fischer & Bullock, 1981). The resulting developmental sequences
 35 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
 37 which the descriptions were drawn. Moreover, particular conceptions tended to become
 reified as “stage” definitions. Four major problems emerged. First, it became possible to
 39 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
 41 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,
 43 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
 45 differences in concept development without developing a new scale in each culture.

A content-independent, universal measure of developmental level, like the skill hierarchy
 47 (Fischer, 1980) and the closely related LecticalTM 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 research¹. 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™ 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 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

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

1 these traditions. It uses nuanced, contextualized accounts of psychological processes and
enriches these accounts by employing tools (both qualitative and quantitative) that are
3 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
5 understand psychological phenomena in context. Universals are used to expose the
contextual, and contextual analyses are used to illuminate and delimit universals,
7 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
9 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
11 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.

13 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
15 approach that better characterizes a qualitatively new level of psychological investiga-
tion—one transcending but including previously differentiated methodological ap-
17 proaches. Realization of this pluralism requires careful, critical analysis of methods in
relation to research questions. It can function only when methodologies are critiqued,
19 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
21 positivism we rightfully mistrust overly simple empirical foundations and “views from
nowhere” that neglect the importance of viewpoint. Simultaneously we also reject the
23 opposite extreme of “hermeneutic idealism,” which at its worst amounts to a counter-
hegemony. Fortunately Westerman and Yanchar also reject these one-sided perspectives,
25 but unfortunately many other researchers remain caught in them. Beyond these pseudo-
certainties lies the pursuit of usable knowledge.

27 The kind of problem-focused methodological pluralism we espouse is far from both
methodological eclecticism and grand synthesis. We argue only that problem-focused
29 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
31 problem-focused adoption of various methodological approaches takes place *in medias res*.
All such integrations are contingent. Aligning methods with problems insures that these
33 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
35 problems. Relating and sometimes merging methods requires teasing apart the essential
from the arbitrary or erroneous.

37 Going beyond the dichotomy between qualitative and quantitative demands a broader
discourse concerning what constitutes good methods. Instead of asking whether
39 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
41 knowledge. Problem-focused methodological pluralism requires assimilating a wide range
of methodological approaches, critiquing them, and adapting them in light of the problems
43 we seek to solve. This problemfocused orientation in effect contextualizes contextualism
and universalism.

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