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## Promoting Positive Youth Development: Relational Data Analysis (RDA)

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# Promoting Positive Youth Development

## Relational Data Analysis (RDA)

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This article provides an overview of the origins and use of relational data analysis (RDA). RDA is a multidimensional, multiphasic framework for unifying data analytic strategies across dimensions (quantitative/qualitative, causal/structural, observation/interpretation, etc.) and phases of analyses (conceptual, theoretical, and research analyses). RDA was developed within a relational metatheoretical methodological framework for overcoming the splits that have historically characterized methodological metatheory. The aim was to formulate a practical, ready-at-hand framework that the developmental scientist could use to unify the analysis of developmental change in real life “applied” settings as well as clinic and laboratory settings.

**Keywords:** *promoting positive youth development; relational data analysis (RDA); mixed quantitative/qualitative research; qualitative methods*

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**A** growing efficacy-outcome research literature using quantitative measures and variable-oriented data analytic strategies has provided evidence for a relation between participation in youth development interventions and positive change (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 1999; Lerner, 2005). Although accumulating efficacy research in support of such interventions has advanced the field, a primary reliance on the use of efficacy-outcome research places limits on the types of questions that can be asked and the types of answers that can be obtained. In this context, a call has been made to move in new research directions that expand our capacity to generate useful knowledge (Jensen, Hoagwood, & Trickett, 1999; Lerner, Fisher, & Weinberg, 2000). The evolution of the Miami Youth Development Project (YDP), a model of a successful and enduring university-community partnership, represents a response to this call (see Arnett, Kurtines & Montgomery, 2008, this issue, as well as Kurtines, Ferrer-Wreder, Berman, Lorente, et al., 2008, this issue).

This response has involved exploring new directions at the intersection of developmental (Lerner et al., 2000) and intervention (Seligman & Csikszentmihalyi, 2000) theories of positive change (i.e., theories of *what* changes and *how* it changes and *what* to change and *how* to change it) in our efforts to create community-supported positive youth development programs. In exploring new directions in theories for promoting positive change, it was our experience that at an even broader level, the theoretical questions that we had to address were inextricably interrelated with and inseparable from the methodological questions that arose in the evaluation of these programs (i.e., *what* to measure and *how* to measure it), and here we faced some of our most difficult challenges. Our strategy, consequently, was to move forward in all areas simultaneously, but with methodological issues in the foreground. It was also in this arena that we found it most useful to draw on (and extend) emerging relational methodological metatheory (Overton, 1998, 2006). Moreover, because of the nature of our population and problem, we sought to articulate a practical, ready-at-hand framework that the developmental scientist could use to address complex issues of documenting life-course change in real-life “applied” settings as well as clinic and laboratory settings (see Kurtines, Ferrer-Wreder, Berman, Lorente, et al., 2008, this issue).

## **Relational Data Analysis**

This context provided the background for the development of what we have termed *Relational Data Analysis* (RDA), a multidimensional, multi-phasic framework for unifying data analytic strategies across dimensions of

analysis (quantitative/qualitative, causal/structural, etc.) and phases of analyses (conceptual, theoretical, and research analyses). In developing RDA, our goal was to develop a data analytic framework drawn from a metatheoretical perspective that provided an alternative to the split metatheory framework—specifically, the relational developmental metatheory articulated by Overton (1998, 2006). As such, RDA is an embodied person-centered approach to psychological inquiry that provides a framework that approximates the relational ideal of overcoming the splits that have historically characterized methodological metatheory (Overton, 1998, 2006).

Developed as part of the Miami YDP, RDA was intended to provide a unified framework in which we, as developmental scientists, could use relational data analysis in the service of our intervention goals, including those of identifying patterns of qualitative change in the meaning and significance of life-course experiences of the multiproblem youth who participate in our programs. By qualitative change, we mean a specific type of change, that is, change in an essential or distinguishing quality or property. Change in an essential property is also referred to by terms such as *morphological* or *transformational* change to distinguish it from quantitative, variational, or dimensional change. In this context, our use of RDA focuses on unifying the qualitative-quantitative split as it has historically characterized developmental research domains. In addressing the issue of type of change, however, we also touch on core features of the split such as the origin of change (causal vs. structural) and the content of change (subjective vs. objective, observed vs. interpreted). RDA is thus intended to approximate the relational ideal of “fusing” the split by providing a framework that makes available to the developmental scientist an array of research methods and procedures that can be relationally employed as needed across the full range of splits that have historically characterized developmental research domains (e.g., causal-structural, quantitative-qualitative, interpretation-observation, variation-transformation, etc.).

## The Relational Circle

Figure 1a depicts the RDA framework visually. As can be seen from Figure 1, this framework depicts the analysis of individual/developmental change (whether induced by processes that were institutional/historical, naturally occurring/experimentally manipulated, self-directed/other directed, etc.) in the form of a circle, with the movement of the analyses being characterized as cyclical. The relational circle and the concept of cyclical movement through the circle provide a useful way for representing the

unification of analytical issues that have often historically been portrayed as split (Overton, 1998). An examination of Figure 1a further reveals that the application of RDA comprises three analytic phases (conceptual, theoretical, and research analyses). Depending upon the research goal, an investigator may begin analysis at any of the three phases. The framework then provides a suggested direction of movement.

The relational circle and the concept of cyclical movement through the circle provide a useful way for representing the unification of analytical issues that have historically been portrayed as split, but they do not address the critical need for the development of analytically refined and consensually agreed upon methodological procedures and practices for resolving conflicting validity claims and eliminating rival or competing hypotheses. As Overton (1998) notes, some progress has been made, but the need exists to have ready-at-hand data analytic strategies for conducting structural analysis that can be broadly applied in a wide range of settings with diverse types of data. Further examination of Figure 1, for example, reveals that when applied to unstructured open-ended verbal response data, the three phases of RDA (conceptual, theoretical, research) can be used in the analysis of qualitative change in all types of narrative data (expressive, instrumental, etc.) and that cyclical movement through the core cycle alternates between two basic levels of analysis (theory and data). Figure 1a also depicts that for each of the three phases of analyses, the two parallel types of analyses, qualitative and quantitative, may be conducted during each phase. It also illustrates how a relational framework facilitates switching back and forth between poles of the splits (qualitative → quantitative → qualitative; structural → causal → structural . . . , etc.) based on findings obtained at any phase of analysis (conceptual, theoretical, research) or level of analysis (theory or data).

Figure 1a also shows, consistent with its multiphasic unified analytic framework, that the three analytic phases of the core cycle of RDA form a relational circle that is cyclical *and* reversible. This feature of RDA, the cyclical and reversible movement between conceptual, theoretical, and research analysis phases, insures that the relational circle remains a non-vicious circle, because in the process of completing each full turn of the circle, each cycle is open to diverse types of modification (i.e., conceptual, theoretical, or empirical), any (or all) of which are capable of transforming the movement of the next new cycle of the circle into a directional spiral.

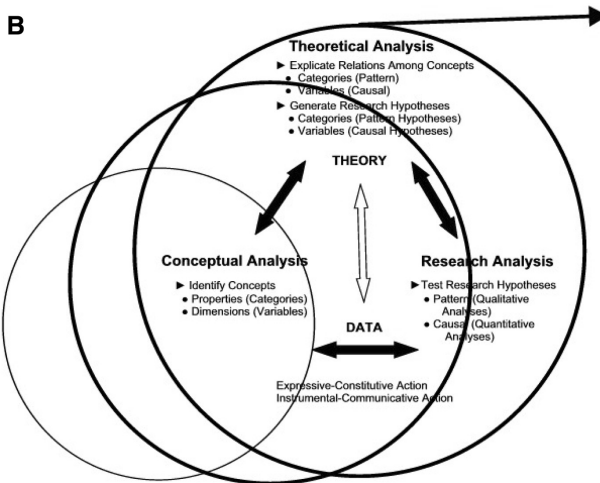
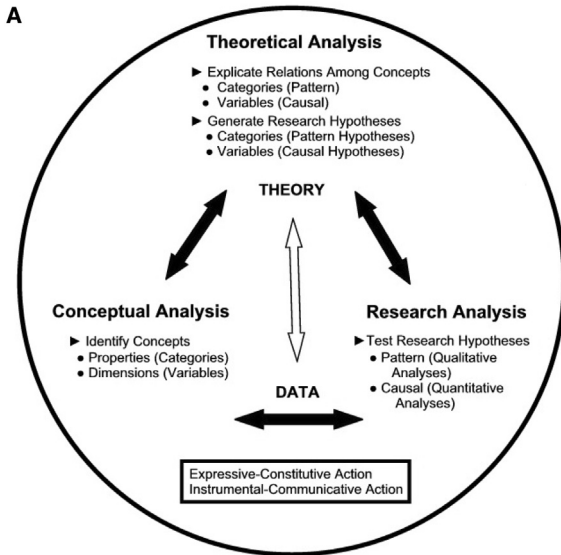
## **Transforming the Relational Circle into a Directional Spiral**

Figure 1b illustrates this process. As shown, after a developmental scientist has collected data consistent with her or his research questions and

**Figure 1**

**1a: Relational Data Analysis (RDA): Core Cycle**  
**1b: Transforming the Circle Movement Through the Phases of the Core Cycle Enables Transforming the Relational Circle Into a Directional Spiral**

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goals and begins the conceptual analysis, the forward movement through the RDA cycle can transform the relational circle into a directional spiral. For example, if the conceptual analysis of the data yields new categories or variables, the cycle moves forward to the theoretical analysis phase. Findings or results from the theoretical analysis of the data involve theory construction that may result in the articulation of structural or causal hypotheses and move the cycle forward to the next phase, the research analysis. Alternatively, a lack of findings at the conceptual analysis (e.g., no new meaningful or relevant categories or variables) may result in the need to collect new data, altering the direction of the circle. Similarly, a lack of findings from the theoretical analysis (i.e., no relevant theoretical or research hypotheses identified) may result in no theory construction and movement back to conceptual analysis or even back to new data collection. In turn, findings from this re-analysis (possibly including new data or the construction of new theory) may propel movement along a new track spiraling outward from the previous cycle.

Forward and/or backward movement through each of the remaining phases of the cycle allows a similar possibility of altering the direction of the circle or transforming it into a spiral. The cycle ends when either (a) the null findings resulting from the hypothesis tested answer the research question or questions that initiated the cycle, or (b) the confirmatory findings resulting from the hypothesis tested answer the research question or questions. Alternatively, results from a hypothesis tested during the research analysis phase may prompt an entirely new cycle by raising new research question or questions and providing a new track for the next RDA cycle.

### *Qualitative Methodological Framework: Grounded Theory*

The methodological procedures and practices that we use as part of RDA for identifying and investigating structural/pattern hypotheses about transformational change in the type of narrative expressions of the subjective meaning and significances of participants' experiences of self and identity draw primarily on grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1998) as adapted for use in our research program (see Table 1). Within the qualitative research tradition, grounded theory is a well-established approach and one of the most widely used qualitative research methods, particularly among researchers who identify with the postpositivist tradition in the philosophy of science (Denzin & Lincoln, 2000). Grounded theory (Strauss & Corbin, 1998) has historically been identified with the sociological/anthropological tradition in the human sciences, a perspective that has challenged epistemological assumptions and methods of inquiry that privilege observation and experimentation over interpretation, and the explanatory power of reduction, induction, and causality over the



**Table 1**  
**Extending the Grounded Theory Concept of Open Coding:**  
**Sequential Tasks of Relational Data Analysis Data Coding**

Task	Data	Coders	Goal
Conceptual (content) open coding	Raw free-response data (e.g., unstructured interview response data)	First set of theory- <i>neutral</i> coders	Identify the unique properties that define the basic pool of conceptual categories. Use properties to identify <i>all</i> qualitatively different (nonoverlapping) content categories in a particular data set. Formulate explicit descriptions of unique properties that responses classified together <i>share</i> with each other (similarity), but <i>do not share</i> with any other categories (difference).
Theoretical open coding	Second-order data generated by the content coders (i.e., the content categories)	Theory- <i>laden</i> coders	Organize content categories into the smallest number of qualitatively different (nonoverlapping), theoretically meaningful categories and identify properties that uniquely define each category. Construct a structural tree chart representing the relation among categories. Hypothesize theoretically meaningful (and relevant) change mechanisms.
Theoretical classification coding	Raw free-response data (e.g., new unstructured interview response data)	Second set of theory- <i>neutral</i> coders	Reliably classify data using previously identified properties of theoretically meaningful categories

Note: We extended the grounded theory concept of open coding by breaking it down into a set of three sequential and distinct tasks, each conducted by independent coders with a specific and distinct set of goals and outcomes. We also extended it to classification coding that uses previously identified properties of theoretically categories.

explanatory power of structure, pattern, or organization. Emerging out of a field research tradition rather than a laboratory research tradition, grounded theory evolved in response to the need to identify, analyze, and evaluate hypotheses concerning the subjective meaning and significance of participants' narrative

response data collected in relatively unstructured nonexperimental field observational and interview methods. This stands in contrast to methods designed to identify, analyze, and evaluate hypotheses concerning causal/functional relations between quantitative variables derived from behavioral observations in experimentally controlled lab or clinic settings.

In this frame, we note that although grounded theory is linked to key metatheoretical assumptions of the positivist tradition, it is not synonymous with the radical critique of the positivism associated with the postmodern perspective. In particular, the postpositivists argue for the significance of a real world of commonsense objects and events as the starting point for the development of a coherent empirical science. On the other hand, postpositivists argue against the postmodern position that science is little more than split-off discourse, an ungrounded, historically situated conversation no more privileged than any other discourse on knowledge (Gergen, 1992). In this frame, grounded theory is used to construct theory from data or, if relevant theories exist, to modify these theories as new data is gathered. Interviews and field observations are the most common sources of data in grounded theory research, although there is no commonly held theoretical justification for not using other sources (Dey, 1999).

## **The Use of RDA: An Overview**

This section provides a general overview of RDA. It illustrates how we used it to develop qualitative methods for coding the open-ended interview response data that we collect in our program of research. Specifically, in this section we illustrate the application of RDA to relatively small samples of open-ended full-response data that we collect with the Life Course Interview (RDA-LCI; see Kurtines, Ferrer-Wreder, Berman, Lorente, et al., 2008, this issue). The application of RDA to actual RDA-LCI data are described in more detail in the empirical studies reported in this special issue (Lewis Arango, Kurtines, Montgomery, & Ritchie, 2008, this issue; Kortsch, Kurtines, & Montgomery, 2008, this issue).

In the illustration reported here, we describe how we used RDA to analyze LCI data for capturing transformational change in the subjective meaning and significance of participants' life-course experiences of the multiproblem youth in our programs. In doing so, we illustrate the basic forward movement through the RDA phases of conceptual, theoretical, and research analysis outlined previously (see Figure 1).

As described below, RDA draws on grounded theory data analytic strategies (Strauss & Corbin, 1998) for the qualitative methods as they are modified for use during each of RDA's three analytic phases. Specifically, the conceptual analysis phase involved conceptual open coding (COC), which includes open coding and constant comparison by the first set of "theory *neutral*" coders, to identify *all* qualitatively different conceptually meaningful content categories/variables in a particular data set. The theoretical analysis phase involves two processes; the first is theoretical open coding (TOC), which involves open coding and constant comparison by "theory *laden*" coders to identify the *smallest set* of theoretically meaningful (and qualitatively different) categories/variables; the second is theoretical classification coding (TCC), which involves the application of standardized RDA procedures, by a second set of "theory *neutral*" coders, to reverse the open-coding process and use properties identified in the previous TOC phase to reliably classify (code, score) new ("raw") uncoded free-response data into previously identified theoretically meaningful categories and subcategories. Finally, the research analysis phase involves constructing theoretically meaningful and/or relevant/plausible theoretical and/or research hypotheses for evaluation (see Kurtines, Lewis Arango, & Richie, 2006, for coding details).

#### *RDA Conceptual Analysis*

This section provides an overview of the RDA procedures for using COC in the identification of conceptual content categories. Consistent with grounded theory, RDA considers concepts the basic elements of a theory, and theory itself as comprising the hypothesized (and presumed actual) relations among theoretically relevant concepts (categories/variables). Because grounded theory considers it important that theory be data driven, the first phase of analysis utilizes open coding to identify concepts (categories) in data relevant to the theory we use in our program (see Table 2). This phase of the analysis thus involves the use of person-centered qualitative methods in the analysis of the raw data to identify the basic building blocks used in the construction and/or refinement/evaluation of theory in general, as well as within the specific theoretical framework that we use in our intervention. The use of two separate open-coding phases (conceptual, theoretical) and two independent sets of open coders (theory neutral, theory laden) requires more resources than conducting a single open coding. However, the resulting possibilities for making new discoveries that result from the use of sequential tasks, each conducted by independent coders with a specific and distinct set of objectives, justified the additional effort.

**Table 2**  
**Categories and Variables**

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A *category* comprises response content that shares one (unique) property.

A *property* is a distinguishing attribute, quality, or characteristic of a specific unit of response content.

A *conceptual content category* comprises response content that shares one nonoverlapping (unique) conceptually meaningful content property.

A *nonoverlapping category* comprises response content that shares at least one unique property that occurs in the data set undergoing analysis. Nonoverlapping categories are *not* necessarily mutually exclusive, they are only nonoverlapping in the data being analyzed.

*Mutually exclusive categories* comprise response content that shares at least one unique property the occurrence of which excludes some other unique property (masculine or feminine, tall or short, self or other, etc.). Mutually exclusive categories are necessarily nonoverlapping (i.e., not dependent upon the data being analyzed).

A *variable* is an attribute of a property and can be either:

A dimensional attribute of a property of a category that can be ordered along that dimension  
or

A category that consists of a single unique property with a single dimensional attribute that can be ordered along that dimension.

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This is so because breaking the open-coding process into two distinct phases ensures that the basic building blocks we use in the construction/refinement/evaluation of theory are rooted in the actual reality of the language-using, culture-bearing, meaning-making community of participants from which the data are drawn, rather than in theoretical perspective that the investigator brings into the research context. The use of theory-neutral coders for the first phase of open coding thus helps to ensure that the theory under construction by the theoretical coders in the second phase is a theory about concepts, constructs, and categories that reflect the actual experiences of the research participants rather than about concepts, constructs, and categories predefined by the theoretical lens of the developmental scientist and the theoretical coders. The aim of the procedure, however, is not antitheoretical in intent. On the contrary, in keeping with the goals of grounded theory, the idea behind splitting the open coding is to conduct research that is bottom-up and data driven (i.e., grounded in data) rather than top-down and theory driven, although, paradoxically, the final aim is to generate better, more useful theories (i.e., theories grounded in relevant data).

During the conceptual analysis phase of RDA, the developmental scientist assembles a set of theoretically neutral conceptual coders (coders systematically selected to represent no particular theoretical perspective but with multiple variegated implicit theoretical perspectives). In our research, theory-neutral coders typically consist of between 5 and 10 undergraduate student

volunteers recruited from a psychology lab course. The theory-neutral coders are asked to work collaboratively on three tasks, each of which generates a particular type of outcome. Specifically, we ask the conceptual coders to use the grounded theory concept of open coding and the method of constant comparison to identify similarities and differences (i.e., they compare properties of participant response data in order to create and eliminate conceptual categories). Strauss and Corbin (1998) define open coding as “the analytic process through which concepts are identified and their properties and dimensions are discovered in data” (p. 101). In using this procedure for category identification, conceptual coders classify/sort participants’ interview response data (e.g. their descriptions of incidents, examples, events, ideas, things, actions/interactions, etc.) into qualitatively different (i.e., mutually exclusive or nonoverlapping) categories/variables on the basis on the similarities and differences of their content properties. They are asked to complete the following three tasks: (1) identify the unique content properties that define the basic pool of conceptually meaningful categories in the raw response data, (2) use those properties to identify all qualitatively different (nonoverlapping) conceptual categories in the data set, and (3) formulate and document an explicit description of the unique-content property that the response data of each conceptual category share in common (similarity) and that they do not share with any other categories (difference).

In our research project with troubled youth, the main focus of the conceptual analysis phase of RDA, when used with the open-ended interview response data such as obtained with the RDA version of the Life Course Interview (Clausen, 1998), is on identifying the content properties of the participants’ narrative expressions of subjective meaning and significance of the life-course experiences elicited by the RDA-LCI. The results of the COC, including the identified content properties, provide the building blocks for the theoretical analysis phase that follows.

## **RDA: Theoretical Analysis**

Consistent with grounded theory, as noted, RDA considers concepts the basic elements of a theory. Also consistent with grounded theory, the theoretical analysis phase of RDA focuses on using theoretical coding for the construction and evaluation of theory when no theory exists, or the refinement and investigation of theory when theory already exists. Theoretical coding is a form of open coding. As used in RDA, it is a second-order form of open coding used for coding (and recoding) conceptually meaningful

content categories and properties into theoretically meaningful theoretical categories and properties. Theoretical coding also includes constructing a theoretically meaningful structural organization of the identified theoretical categories and properties.

During the theoretical analysis phase of RDA, the developmental scientist assembles a set of theoretically committed coders (coders systematically selected to be representative of a particular theoretical perspective) to work collaboratively on three tasks, each of which generates a particular type of outcome. In contrast to the analysis of each participant's raw interview response data during the conceptual analysis phase, theoretical coders are asked to use the method of constant comparison to review and discuss the conceptual content categories identified in the previous phase from the perspective of the guiding theory and consensually generate the required three outcomes.

During TOC, the conceptual content categories identified in the previous phase provide the basic data used to identify the smallest number of qualitatively different (nonoverlapping) theoretically meaningful categories (and associated subcategories) in a particular data set. Theoretical coders also formulate and document an explicit description of the specific content and structural/organizational properties that makes each theoretical category in the response data theoretically meaningful and unique (qualitatively different from all other theoretical categories).

Thus, like a content category, a theoretical category is a coding group that shares a meaningful property—but in this case it is a theoretically meaningful property. A theoretically meaningful property differs from a conceptually meaningful property in that it is not only a property whose content has conceptual meaning, but it is also a property that the theoretical coders agree has additional meaning and significance over and above its content meaning, at least from the perspective of their particular theory. Theoretical meaningfulness is thus not only defined relative to a particular theory but also relative to a particular set of theoretical coders selected to be representative of that theory. Indeed, this is one of the strengths of RDA—as a methodological metatheory, it not only allows for differences between theoretical approaches, it also accommodates differences between schools of thought within theoretical perspectives. More important for research purposes, it provides a ready-at-hand method for capturing those differences and constructing theoretical formulations for testing hypotheses derived from them by the most representative group of theoretical coders ready at hand to the developmental scientist. Thus, the identification of the theoretical meaning and significance of the content properties and, as discussed next, of the construction of a structural organization for the

identified theoretical categories and their properties is one of the primary tasks of the theoretical analysis phase of RDA.

Within RDA, a conceptual content category comprises response content whose content share only one nonoverlapping (unique) content property. The conceptual categories generated by the conceptual analysis, consequently, serve as the most basic elements or building blocks of the theory under construction/refinement/evaluation during the theoretical analysis. Because each content category identified during the COC has only a single unique property, the conceptual coders effectively break down the raw data to its most basic or elementary conceptual properties that are then made available to the theoretical coders to analyze, organize, combine, recombine, add to, or eliminate in ways that are theoretically meaningful.

Equally important, having theory-neutral conceptual coders break down the raw data renders the theoretical analysis phase more likely to uncover new or novel variations in participant response data. That is, the use of theoretically neutral coders at the level of the raw data helps to ensure that the conceptual categories identified by the process are solidly anchored in the ever evolving experiences of ordinary life. The result is that new or novel categories of life-course experience identified by the conceptual coders serve as the leading edge of the knowledge development process at this phase. New or novel categories of life-course experience captured by open coding at the conceptual analysis phase are subsequently passed on to the theoretical analysis phase, where the theoretical coders then take the leading edge of the knowledge development process as they analyze the new conceptual categories and construct, as needed and/or relevant, a theoretical account. At this point, the task of the theoretically committed coders is to test and evaluate their theoretical perspective against the evolving socio-cultural reality revealed by the properties of the participants' response data found to be unique by the antecedent and independent analysis of conceptual coders representing no particular theoretical perspective. Thus, the task for the theoretically committed coders is to evaluate critically which, if any, of the identified concepts, constructs, and categories have theoretical utility within the particular population under study at the particular and specific intersection of the developmental and historical moment the data were collected. If necessary, their task also includes the construction of new theory relevant to new concepts or constructs that emerged from the response data. Most important, in RDA this test is built into the method itself, ensuring that the initial conceptual analysis will uncover any new or novel concepts, constructs, and categories. The new or novel constructs found during conceptual analysis are not obscured or overlooked, as they might likely be

when data analysis begins at a point where it is already infused with pre-existing theoretical constructs.

The TOC analysis is thus expected to generate three outcomes: (1) From the pool of categories identified during COC, identify the *smallest* set of theoretically meaningful categories and subcategories along with descriptions of the properties that uniquely define each of them; (2) construct a theoretically hypothesized structural organization between the identified theoretical categories and subcategories (flat, nested, hierarchical, etc.) and a structural tree chart (STC) that visually represents the structural organization among the categories, subcategories, and their properties; and (3) construct hypotheses about mechanisms that provide a theoretically meaningful and plausible explanation of change over time (causal/functional, structural/transformational, etc.) in the theoretical categories. This third outcome is generated only when the theoretical analysis involves an analysis of change (e.g., developmental analysis, historical analysis) and is not necessarily needed for non-temporal designs (e.g., cross-sectional).

## **RDA Research Analysis**

The transition to the research analysis phase usually takes place seamlessly as theoretical *coders* move from that role into the role of being theoretical *researchers*. In this role, they address the challenge of testing what they consider to be the most theoretically meaningful and significant research questions within the context of the goals/purpose of the guiding theoretical framework (e.g., analyzing developmental change, analyzing cohort differences, etc.), the research design under which the data was collected (e.g., descriptive, longitudinal, experimental, quasi-experimental, etc.), and the type of measures used (e.g., qualitative, quantitative).

During this phase, the theoretical coders assembled by the developmental scientist now function as an advisory board of theoretical researchers whose expertise falls within the domain of the guiding theory. They work collaboratively with the developmental scientist to generate initial research hypotheses that are refined, elaborated, and subjected to appropriate research analysis (drawn from qualitative and/or quantitative research traditions) within the context of the study's research design, population, and measures. The initial research hypotheses are then refined and extended as informed by findings generated during the research analysis phase.

The first two phases of RDA (open coding for conceptual and theoretical analysis) mainly involve theory construction/refinement; the third phase



(research analysis) involves evaluation of the constructed/refined theory. In our research, the first task in the research analysis phase of RDA is a preliminary analysis of identified theoretical categories using procedures that draw on well-established quantitative psychometric methods; the second is to conduct quantitative evaluation of qualitative research hypotheses where relevant/appropriate (Lewis Arango et al., 2008, this issue; Kortsch et al., 2008, this issue).

### *Research Analysis Task 1: Psychometric Analysis Using TCC*

The first research analysis task as we apply RDA in our research is to conduct psychometric analysis (PA; reliability and validity estimates) using TCC. TCC is coding that uses previously identified properties of theoretically meaningful categories for making the decisions needed to classify reliably raw, uncoded, free-response data into the theoretically meaningful categories and subcategories identified in a previous RDA (see Kurtines et al., 2006).

Within RDA, the three-step PA serves two analytic functions; the first is methodological and the second theoretical. The first step of the PA, which is primarily methodological, involves using traditional PAs to evaluate the reliability of the coding categories, that is, the theoretical coders' descriptions of the unique properties that have been identified as defining each of the identified theoretical categories. The second and third steps of the PA-TCC, which are primarily theoretical, similarly involve the use of traditional psychometric analyses, only in this case in conjunction with widely used qualitative methods to provide a preliminary evaluation of the construct and criterion-related (construct) validity of the identified theoretical categories.

### *Research Analysis Task 2: Quantitative Evaluation of Qualitative Research Hypotheses*

If the PA (reliability and validity estimates) using TCC yields moderate to high estimates for the reliability of the coding categories and preliminary evidence for their convergent and concurrent (external) validity, the research analysis phase moves on to Task 2, the quantitative evaluation of qualitative research hypotheses. The theoretical researchers begin to address relevant research questions for those identified categories with appropriate psychometric properties. Research hypotheses are generated, refined, and subjected to appropriate research analysis within the project's research design, population, measures, and so forth. Evaluating both quantitative and qualitative research hypotheses serves to extend and refine RDA as a

framework to approximate more closely the relational ideal of unifying quantitative and qualitative methods in the analysis of change.

If a researcher or researchers' initial research questions/goals and/or all subsequent research questions/hypotheses (and modifications) that emerge from the ongoing flow of the research analyses are appropriately addressed (with either positive *or* null results), the research analysis phase of RDA is anticipated to bring the core cycle of RDA full circle and to a close. Consistent with the cyclical *and* reversible nature of the core cycle, however, findings of the ongoing research analyses flow may result in modifications that include not only forward movement to the completion of the research analysis phase but also, as discussed next, backward movement through earlier phases of analysis depending on the nature of the obtained results.

## Discussion

This article provided an overview of RDA and the basic forward movement through three analytic phases of the core cycle of RDA (conceptual, theoretical, and research analysis). We conclude by extending our previous observation that in its implementation, movement through the core cycle of RDA is usually reversible as well as cyclical, with conceptual, theoretical, and empirical finding/results generating new iterations of analysis and/or recycling through previous analytic phases in a dialectical fashion. Thus, for example, an RDA cycle that begins at the conceptual analysis phase with an open coding of qualitative data may identify a set of categories/variables that during the subsequent theoretical analysis may *not* provide enough theoretically meaningful and/or relevant information to identify plausible theoretical hypotheses about structural organizational patterns within or between identified categories *or* theoretically meaningful hypotheses about the causal (i.e., functional, etc.) relations among the identified variables to continue the theory construction process. In this case, the result may be the need to collect additional data of the same type or additional data of an alternative type and to return the conceptual analysis phase to identify a new set of categories/variables.

Alternatively, the open coding may identify a set of categories/variables that during the subsequent theoretical analysis provides enough theoretically meaningful and/or relevant information to generate plausible theoretical and/or research hypotheses about the structural relations among the identified categories *or* theoretical and/or research hypotheses about the causal relations among the identified variables, resulting in movement to the next phase of the cycle, the research analysis phase. The hypothesis testing that takes place during the research analysis phases, in turn, may fail to support the

research hypotheses, resulting in the need to return to a previous conceptual or theoretical analysis phase (or even data collection) to identify new categories and/or generate theoretical and/or research hypotheses resulting in a new directional spiral.

In this way, the research hypotheses generated by the research analysis phase of RDA provides the opportunity to draw on open-ended measures, methods, and data analytic strategies that have evolved in qualitative/field tradition for rendering intelligible the meaning and significance of individual and institutional change and fuse the results of the use these qualitative methods with the use of methods and data analytic strategies for testing research hypotheses derived from the quantitative/experimental research tradition. Our approach to unifying them involves a proactive infusion of elements from both traditions. It involves efforts to develop practical, ready-at-hand qualitative measures and methods for collecting narrative expressions of subjective experiences that could be coded with a level of reliability and validity that parallel those of quantitative measures and methods and coming up with methods and procedures for analyzing qualitative data that draw on the capability and power of the statistical methods used in the analysis of quantitative data. In this context, the preliminary findings of our program of research (Kurtines, Montgomery, Ferrer-Wreder, et al., 2008, this issue) point to a number of potentially useful methodological directions for facilitating the advances in knowledge of human development.

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