Toward defining order 16 and describing its performance for the model of hierarchical complexity

Sara Nora Ross[1], Michael Lamport Commons[2], Eva Yujia Li[3], Kristian Stålne[4], and Cory David Barker[1]

1 Antioch University Midwest
2 Harvard Medical School
3 Dare Institute
4 Department of Construction Sciences, Lund University

ABSTRACT

We trace the first four years of the new theoretical discourse on the definition order 16 of hierarchical complexity. Tasks performed at this order are similarly classified as stage 16 performances. Until this current discourse began, the highest order identified using the MHC was order 15, named cross-paradigmatic. In different groupings, several MHC theorists have discussed the properties and definition of this new order. To this point, an explicitly collaborative effort has yet to be undertaken. To reach agreement on definition and properties of order 16 and task performances at that order will likely require us to agree on more complex than usual hierarchical complexity-based scoring criteria and inter-rater standards. To meet these new challenges, these criteria and standards must be precise enough, complex enough, and general enough to apply across the uncommonly disparate and high-level examples proposed thus far as performances at stage 16. Since these methodological foundations have not yet been developed, to date our discourse is comprised of some who consider the process of defining the new order and empirically demonstrating it further along than others do. This theoretical development terrain promise intense and promising work ahead on this breakthrough in applying the MHC, its contributions to behavioral development theory, and the measurement of the most complex human accomplishments recognized thus far.

KEYWORDS: cross-paradigmatic, meta-crossparadigmatic, model of hierarchical complexity, stage, performative-recursive

Fields of study have a social obligation to communicate about their findings as well as their state of evolution *as* areas of study. When areas of study or inventions within them are so new that the publication record does not yet report findings, to publish interim reports on the early discourse helps fulfill that obligation. This brief article falls in that genre of interim reporting. Our purpose is to offer a concise report on the first four years of the new theoretical discourse on the definition of order 16 of hierarchical complexity. In collaborating to report our progress on defining order 16 — including efforts to describe and measure tasks performed at that order—we move the theoretical discourse one step further in its evolution.

We begin by stipulating the meaning of *coordination,* a MHC term that is central for this discussion (other MHC terms are defined elsewhere in this issue). Tasks performed at an order of complexity *n* are actions that *coordinate* lower-order actions *n-1*. To *coordinate* means to *operate on*. These operations may take a range

of forms to: reflect on, compare, contrast, transform, define, and/or synthesize the *properties and behaviors of actions* (Commons, Ross, Miller, Richardson, Crone-Todd, & Miller, 2012; Ross, 2008). Note that "to understand" information is not one of the operations. This is because one can understand information at an order *n*, but could not have created the information nor coordinate it in a higher-order synthesis at *n+1*. In summary, Piaget's *operational* concept is central in this present discussion, as well as axiomatic in MHC theory: tasks of any order of complexity, *n, operate on* tasks performed at the *n-1* order of complexity *by coordinating* them.

» RECOGNIZING AN OCCURRENCE OF ORDER 16

The publicly-marked beginning of the discourse on order 16 was written in 2007 (published in late 2008), in the editors' introduction to the *World Futures* special issue on hierarchical complexity and postformal thought (Commons & Ross, 2008). That introduction traced the history of the MHC's development to that point, with the last entry in the history as follows.

Author note: Correspondence regarding this paper should be addressed to Dr. Sara Nora Ross. E-mail: sara.nora.ross@gmail.com

Table 1. History of orders 14 and 15

Orders	Earlier work and sources	Ross (2008)
Order 14 paradigmatic	Descriptions: » Fit metasystems together to form new paradigms (2007 scoring manual) » Work with the relationship between very large and often disparate bodies of knowledge in order to reflect on, compare, contrast, transform, and synthesize multiple principles and metasystems. (2007 scoring manual & World Futures expansion) » Or show it is impossible to do so, if, in a domain, the highest stage task is showing that metasystems are incomplete and adding to them creates inconsistencies. No further stages in that domain on that sequence are then possible (Sonnert & Commons, 1994). » Definition: A paradigm is a systematized set of relations among metasystems that reflects a coherent set of assumptions (World Futures expansion)	Properties of structure and process (dynamics) that characterize disparate metasystems are seen to apply to or coordinate with one another. E.g., meta-system comparisons that describe paradigmatic relationships (slide 7, emphasis in original)
Order 15 cross-paradigmatic	Descriptions: » Fit paradigms together to form new fields (2007 manual) » Form new fields by crossing paradigms; » Integrate paradigms into a new field or profoundly transform an old one; » A field contains more than one paradigm and cannot be reduced to a single paradigm. » Definition: A cross-paradigm is a systematized set of relations among paradigms that reflects a coherent set of assumptions (World Futures expansion)	Properties of structure and process (dynamics) described by disparate paradigms are seen to apply across and operate on those paradigms (slide 7, emphasis in original)

Sara Ross is the one who pointed out that the model is fractal, since it shows by measuring any tasks that it is self-similar at all scales. She came up with the fractal characteristics of both the transition steps and within the smash sequence that is within the transitions.... Now, we have to come up with a name for the new order 16 in the Model. This is the stage-generator characteristic of the Model's axioms in action: to reflect on the tasks of a given order, one has to be performing at the next highest order. (Commons & Ross, 2008, p. 302)

Throughout this brief report we do not explicate examples or the coordinations that produced conclusions, and we have agreed to exclude mention of all but one or two examples. This is because such a project requires a separate paper, and as we report here, we have further to go before solid analysis can be offered. Thus, we include the foregoing excerpt only as the documented marker for the beginning of the order 16 work, without explaining how the work on the fractal dimensions of the model invokes order 16.

» REVISING ORDERS 14 AND 15

The next public marker was the March 2008 symposium of the Society for Research in Adult Development, where Ross (2008) reported her work to name and describe order 15, and to posit corrections to the MHC's descriptions of orders 14 and 15 (Table 1). Those corrections were necessary because the descriptions are the action building blocks: they represent the order *n* - 1 actions coordinated at the next higher order.

Ross proposed the revised descriptions to orders 14 and 15 to solve the earlier descriptive and definitional problems: "To date, the scoring manual's stage 14 and 15 descriptions (*a*) violate the content-free, scale-independence of hierarchical complexity its mathematical and fractal properties and (*b*) describe the task in terms of the content of social outcomes of performing the task (a field of study is a social outcome)" (2008, slide 6). This means the descriptions must be content-neutral and internally consistent with MHC as a general theory.

The distinction between task descriptions and orders' definitions seems crucial for our collective efforts. Presentations of the MHC have tended to rely on descriptions since the mathematical representation of hierarchical complexity includes no order-specific content. Definitions are qualitatively different from descriptions, of course, and descriptions need to be consistent with the related definitions. The work ahead involves agreed versions to describe the higher orders 14–16 and define their terms. As Barker (Personal Communication, 2012) stressed in one conversation, these will need to meet the test of representing all possible performances of each order *at all different scales* of task domains. This is challenging because of the vast number of task domains across orders. While some of us have looked to only the hard sciences for evidence of the highest orders of complexity, some of us argue such innovative performances are not confined to only that domain of human activity.

» NAMING AND DESCRIBING ORDER 16

Two names have been proposed for order 16. In the discussion below, Commons, Li, and Stålne use the term *Meta-cross-paradigmatic*. Ross proposed *Performative-Recursive* as a meaningful representation of the dynamics she had analyzed for several years, described as follows.

What the task performer is doing while embedded in the performance:

Observes and understands that by virtue of the cross-paradigms that account for their dynamics, disparate entities ranging from the universe, to paradigms, to species, to social metasystems, to individuals, for example, by their nature and/or with volition, perform recursive procession actions upon themselves, which transform them while and by performing each recursion; transformation may be "positive" or "negative." (Ross, 2008, slide 9, emphasis in original)

Subsequently, Ross and Barker became co-thinkers on scoring these dynamics and examples of them. They agree the description merits refinement and definitions need to be developed. To date, the performative-recursive name has held up its "goodness of fit" from their perspective. Commons, Li, and Stålne have not proposed a description for order 16, but instead, report on the process they went through in the attempt to do so.

» SCORING THE TASK OF DESCRIBING ORDER 16

By 2011, we all (Commons, Li, and Stålne) began to understand how string theory in physics might coordinate the two paradigms of quantum mechanics and the general theory of relativity. We reviewed the history of string theory and the task of coordinating these two lower order paradigms of quantum mechanics and relativity. Our description of such coordination from a developmental perspective of the field of physics was taken from string theory itself. We did not write the rules for such coordination explicitly because string theory states them and is too difficult to translate at this time into the MHC. So the performance is transitional to stage 15 at step 4 smash (see Commons & Richards, 2002). While we have had Stage 15 described since 1984, and Commons and Bresette (2000; 2006; Commons, Bresette, & Ross, 2008) have described many such historical examples of Stage 15, we failed to notice that it would take stage 16 (meta-cross-paradigmatic) to compare Stage 15 examples. (Also see the examples of stage 15, cross-paradigmatic in Stålne, Commons, and Li (in press). This last paper on new physics describes the integration of wave and gravity into string theory.) One has to consider whether or not a performance is stage 15 or not. That reflection requires one more stage of higher complexity as Dawn Schrader, (personal communication, 1985) pointed out in the early days of developing the MHC. At the stage 16, by defining and reflecting on the properties of stage 15 action, those actions point to the existence of new order/stage 16. To score material without matching to examples, one has to perform one stage higher than the material to be scored. So the performance to date is transitional to stage 16 at step 4 smash (Commons & Richards, 2002).

» DISCUSSION

While there is a reasonable measure of certainty that Stage 16 is attainable or may have already been attained, there are lingering issues that need to be addressed. One discussion point is in regards to Ross's proposed revised descriptions of the order 14 and 15. It could not have been known for certain that their previous definitions were in need of improvement until an adequate number of examples of such stages across multiple domains were compared. These new revisions improve the definitions to be more encompassing and robust. Similar to the definitions that came before them, these definitions need to be tested against the breadth of task actions across all domains. We might keep in the back of our minds the original definitions while the new definitions are tested individually by the adult development community, while looking towards a future time in which to reevaluate the revised definitions to see if another revision is needed.

Another point of discussion is, as mentioned above, there exist two proposed terms to be used for order/stage 16. For now, either of these terms may be used as placeholders until a final term is decided by participants of this discovery. But until a comparison of order 16 examples shows similar properties of what these magnitudes of task actions share in common, it may be too early to tell what term best fits its properties. Ross's description of order/stage 16 must be followed up by the aforementioned need for a written analysis. Commons and Stålne's careful documentation through the transition to 16 may be expected to result in a written analysis as well. Comparison of these analyses of transition into and attainment of Stage 16 may be joined by other analyses, all of which may lend to a future paper to continue the capture of the state of affairs of this endeavor. Authors of this paper, among others, are taking different approaches towards the transitions to, attainments of, and describing of order 16, which produces a much needed variety of approaches. We hope that individuals, in groups and in a larger collaborative effort, will yield the much needed data required to demonstrate Stage 16, and do so in an empirically testable way. Such an approach allows participants in this discussion and discovery to not only score their own task actions, but for participants' work to be scored by others to corroborate the scores to verify order 16 discovery and performances of tasks at stage 16.

Such checks and balances are especially important when coordinating more complex than usual hierarchical complexity and levels of abstraction. To bring this paper to a conclusion: this theoretical development terrain promises intense and promising work ahead on this breakthrough in the MHC, its contributions to behavioral development theory, and the measurement of the most complex human accomplishments recognized thus far. ∎

REFERENCES

Commons, M. L., & Bresette, L. M. (2000). Major creative innovators as viewed through the lens of the general model of hierarchical complexity and evolution. In M. E. Miller & S. Cook-Greuter (Eds.), *Creativity, spirituality, and transcendence: Paths to integrity and wisdom in the mature self* (pp. 167-187). Stamford, CT: Ablex Publishing Corporation.

Commons, M. L., & Bresette, L. M. (2006). Illuminating major creative innovators with the model of hierarchical complexity. In C. Hoare (Ed.). *Oxford handbook of development and learning*. (pp. 255-280). New York, NY: Oxford.

Commons, M. L., Bresette, L. M., & Ross, S. N. (2008). The connection between postformal thought and major scientific innovations. *World Futures: Journal of General Evolution, 64*, 503-512. doi: 10.1080/02604020802303838

Commons, M. L., & Ross, S. N. (2008). What postformal thought is, and why it matters. *World Futures: Journal of General Evolution. 65*(1-3), 321-329.

Commons, M. L., & Richards, F. A. (1984a). A general model of stage theory. In M. L. Commons, F. A. Richards, & C. Armon (Eds.), *Beyond formal operations: Vol. 1. Late adolescent and adult cognitive development* (pp. 120-140). NY: Praeger.

Commons, M. L., & Richards, F. A. (1984b). Applying the general stage model. In M. L. Commons, F. A. Richards, & C. Armon (Eds.)*, Beyond formal operations: Vol. 1. Late adolescent and adult cognitive development* (pp. 141-157). NY: Praeger.

Commons, M. L., & Richards, F. A. (2002). Organizing components into combinations: How stage transition works. *Journal of Adult Development, 9*(3), 159-177.

Commons, M. L. & Ross, S. N. (2008). Editors' introduction to the special issue on postformal thought and hierarchical complexity. *World Futures: The Journal of General Evolution, 64*(5-7), 297-320.

Commons, M. L., Ross, S. R., Miller, P. M., Richardson, A. M., Crone-Todd, D. Miller, J. G. (2012). *Applying the model of hierarchical complexity: Scoring moral narratives and constructing moral development instruments* Unpublished manuscript available from commons@tiac.net.

Sonnert, G. & Commons, M. L. (1994). Society and the highest stages of moral development. *Politics and the Individual 4*(1), 31-55.

Stålne, K., Commons, M. L., & Li, E. Y. (In press). Hierarchical complexity in physics. *Journal of Adult Development.*

Ross, S. N. (2008). *Toward describing new order 15 in the model of hierarchical complexity and refining descriptions of paradigmatic order 13 and cross-paradigmatic order 14.* Paper presented at The Annual meeting of the Society for Research in Adult Development. March, 2008. Boston, MA.