

## Afterward

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The papers in this special issue represent a large step forward in understanding adult development and development in general. There is still a long way to go. There are many obvious question. As Michael F. Mascolo and Kurt W. Fischer (2010) point out, there are domains. Fischer (1980) and myself have argued and shown that development is uneven across domains. I have shown in an unpublished paper that it is even within the mathematical/logical/physical sciences domain. Many of the measures have not been scored using the Model of Hierarchical Complexity (but see Robinett, 2008 for the DIT) and then having performance on those measures Rasch Analyzed. This is essential for internal validity.

There are different kinds of validity, Internal, Cross measure, and Eternal. Internal variety can be established partially by applying Rasch Analyses, and even stronger if one can characterize the items within an instrument with some prior metric. The later fits into the psychophysical rather than just the psychometric analysis. Note that this concentrates on the items. Cross measures validity is usually tested with factor analysis psychometrically or transfer of training experimentally. Again, this has not been done on the proper scale. These concentrated on the participant scores and will be somewhat independent of the item validity because of domain differences. There are no big studies in which most of the well worked out instruments are given in pairs or triplets so that the factor structure of those instruments may be examined. This would help with understanding the domain issue.

There may be method differences in measurement. These have been tested only in a small subgroup of measures such as Rest, Narvaez, Bebeau, and Thoma (1999) DIT and Colby and Kohlberg's Moral Judgment Test (1987a, 1987b). Georg Lind (1978) also has some data. The methods include open ended interviews, structured interview, problems to be solved, preferences of solutions.

Work on important development scales are also missing in this issue. Dawson's (2004) Letical Assessment Scale is one such measurement. Another measurement is Fischer & Bidell's (1998) Cognitive Development Scale. Very little has been touched upon about this scale in this issue.

Even more urgent are studies across periods in the Eriksonian framework. Those results would also have to be Rasch analyzed. As far as I know, there are no generators that characterize the structure or some other aspect of the periods that produce the different periods. There seem to be big cohort and cultural effects.

The dynamic models suggested by Ross (2008, this issue), Commons (This issue), and Boom (this issue) need to be more extensively applied and compared to the mathematic dynamic models of cycles of cognitive and brain development (Fischer, 2008). Van Geert (1998) showed how Piaget and Vygotsky's theories can be transformed into a general dynamic model of development. This model could also be compared to Ross, Commons and Boom's dynamic models. These dynamic models could be especially applied to study acquisition during stage change.

The relationship between how items and domains are valued and how those values are discounted is a new endeavor just getting underway. The exception is Thoma work on stage and action.

Last and most important is External validity. Within stage theories, this has been characterized as the stage and action issue. What we need are multiple regression studies with multiple input variables to see how well we can predict real world behavior. Most of the current studies just examine just one input variable.

## References

- Dawson-Tunik, T. L. (2004b, 11/1/04). The Lectical™ Assessment System. 1. Retrieved December, 2004, from <http://www.lectica.info>
- Fischer, K. W. (1980). A theory of cognitive development: The control and construction of hierarchies of skills. *Psychological Review*, 87(6), 477-531
- Fischer, K. W. (2008). Dynamic cycles of cognitive and brain development: Measuring growth in mind, brain, and education. In A. M. Battro, K. W. Fischer & P. Léna (Eds.), *The educated brain* (pp. 127-150). Cambridge U.K.: Cambridge University Press.
- Fischer, K. W., & Bidell, T. R. (1998). Dynamic development of psychological structures in action and thought. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology: Theoretical models of human development* (pp. 467 – 561). New York, NY: Wiley
- Colby, A., & Kohlberg, L. (1987a). *The measurement of moral judgment: Vol. 1. Theoretical foundations and research validation*. New York: Cambridge University Press.
- Colby, A., & Kohlberg, L. (Eds.) (1987b). *The measurement of moral judgment: Vol. 2. Standard form scoring manuals*. New York: Cambridge University Press.
- Lind, G. (1978). The Moral Judgment Test. Manual for the test's application and revision. In L.H. Eckensberger (Ed), *The development of moral judgment - theory, methods, practice*. (pp. 337-358), Germany: Saarbrücken. University Print
- Mascolo M.F. & Fischer, K. W. (2010) The Dynamic Development of Thinking, Feeling and Acting over the Lifespan. In W. F. Overton (Ed.), *Biology, cognition and methods across the life-span*. Hoboken, NJ: Wiley
- Molenaar, P.C.M. & Lo, L. (2012). Dynamic factor analysis and control of developmental processes. In: B. Laursen, T.D. Little, & N.A. Card (Eds.), *Handbook of developmental research methods*. (pp. 333-349). New York: Guilford Press.
- Molenaar, P.C.M., Smit, D.J.A., Boomsma, D.I., & Nesselroade, J.R. (2012). Estimation of

- subject-specific heritabilities from intra-individual variation: iFACE. *Twin Research and Human Genetics*, 15, 393-400
- Molenaar, P.C.M., & Campbell, C.G. (2009). The new person-specific paradigm in psychology. *Current Directions in Psychology*, 18(2), 112-117.
- Molenaar, P.C.M., Sinclair, K.O., Rovine, M.J., Ram, N., & Corneal, S.E. (2009). Analyzing developmental processes on an individual level using non-stationary time series modeling. *Developmental Psychology*, 45(1), 260-271.
- Rest, J., Narvaez, D., Bebeau, M., and Thoma, S. (1999). A neo-Kohlbergian approach: The DIT and schema theory. *Educational Psychology Review*, 11 (4), 291–324. doi:10.1023/A:1022053215271
- Robinett, T. (2008). A comparison of moral reasoning stages using a Model of Hierarchical Complexity. *World Futures Journal*, 64, 468-479.
- Ross, S. N. (2008). Using developmental theory: When not to play telephone games. *Integral Review*, 4(1), 31-46.
- Ross, S. N. (in press). Fractal model of nonlinear Hierarchical Complexity: Measuring transition dynamics as fractals of themselves. *Journal of Adult Development*.
- Van Geert, P. (1998). A dynamic systems model of basic development mechanisms: Piaget, Vygotsky and beyond. *Psychological Review*, 5(4), 634–677