Return-path: <jhayman@uvaix2e1.comp.UVic.CA>
Date: Thu, 06 Nov 1997 14:12:26 -0800 (PST)
From: "J. G. Hayman" <jhayman@UVic.CA>
Subject: Re: Address of John Hayman
To: David Hanson <dhanson@selu.edu>

My postal address is: 4902 Lochside Drive, Victoria, B.C. Canada, V8Y 2E4.
(John Hayman)

MSS IA, VIII

542-6160

TABLE 1

ACCOUNT OF A TOUR OF THE CONTINENT:
ORDER OF SECTIONS OF POEM, BY MANUSCRIPT*

MS VIII Draft	MSS IA,† VII	Ruskin's ~~MS~~ Line Numbering	MS IX Fair Copy	MS VIII Endpaper List of Proposed Topics	Library Edition	Actual Tour Itinerary
	"Calais" (poem, MS IA)	1-24	Drawing (*Works*, 2:341 n. 1); "Calais" (poem); drawing (*Works*, 2:341 n. 3)		"Calais" (poem; *Works*, 2:341)	
	"Calais" (prose, MS IA)	Unnumbered	Drawing (*Works*, 2:341 n. 4); [Calais] (prose); drawing (*Works*, 2:342 n. 2)		[Calais] (prose; *Works*, 2:341-42)	
	[Cassel] (poem, MS IA)	25-62	Drawing (*Works*, 2:342 n. 3); "Cassel" (poem); drawing (*Works*, 2:343 n. 1)		"Cassel" (poem; *Works*, 2:342-43)	
			Drawing (*Works*, 2:343 n. 2); [Cassel] (prose); drawing (*Works*, 2:344 n. 1)		[Cassel] (prose; *Works*, 2:343-44)	
	"Lille" (poem, MS IA)	63-112	Drawing (*Works*, 2:344 n. 2); "Lille" (poem); no drawing at end of poem		"Lille" (poem; *Works*, 2:344-45)	

ADOLESCENTS WHO KILL: ARE THERE MORE MEDICAL RISKS?

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RUNNING HEAD: ADOLESCENTS WHO KILL: MEDICAL RISKS

P355 (top): WW echo. Drawing on WW for mountain scenery. Is there an association w/ Byron w/ water in "Tour"?
— Here, too, is the passage that Stephen notes sounds like the London sonnet

Voice for the prose different from that for the poetry. The prose "I" often jesting, somewhat Dickensian at times + often captious. The poetry seeks sublime/picturesque effects at odds sometimes w/ the surrounding prose. E.g. "Cologne" (poem) is looking at hills that are

first sighted in the Andernacht prose & the Cologne poem has nothing to do w/ the disappointments recorded in its prose.
The Calais, Meuse, + Brussels poems/prose are maybe better matched.

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boys and 14 girls, mean age = 10-5, SD = 6 months). The Japanese sample consisted of 21 6-year-olds (10 boys and 11 girls, mean age = 6-5, SD = 1 month), 26 8-year-olds (13 boys and 13 girls, mean age = 8-5, SD = 2 months), and 20 10-year-olds (10 boys and 10 girls, mean age = 10-5, SD = 2 months). For reasons of scheduling, the test of mathematics achievement was administered to a different group of children in the same schools. For this comparison we used 34 U.S. fifth graders (20 boys and 14 girls, mean age = 10-11, SD = 5 months) and 29 Japanese fifth graders (17 boys and 12 girls, mean age = 11-2, SD = 4 months).

Measures

The test of Number Knowledge and the Balance Beam task—two of the measures used in the study—are described in Chapters II and III. Data on the Number Knowledge test were obtained at all ages. Unfortunately, the data on the Balance Beam were obtained only from children at the 6- and 10-year-old levels. Japanese 8-year-olds could not be tested.

Mathematics achievement.—The test that we used to measure children's scholastic achievement was an abbreviated version of the fifth grade assessment device that had been constructed by Stevenson and his colleagues for their comparisons of mathematics learning in the United States, Japan, and Taiwan (Stevenson et al., 1986; Stigler et al., 1982). The primary reason for using this index was to measure achievement on the topics that are actually taught to children in all three countries, and the Stevenson et al. test was constructed on the basis of a thorough analysis of the mathematics curricula used in these countries. Moreover, it had already been used in cross-cultural comparisons and shown to differentiate the performance of U.S. and Japanese children. The subset of items that we selected from the Stevenson et al. test consisted of 36 problems; 23 of these assessed children's computational skills in addition, subtraction, multiplication, and division, seven were geometry problems of a simple nature, and six were word problems (the complete set of problems is available on request).

Procedures

All three tests were originally constructed in English and then translated by researchers fluent in Japanese. The Japanese children's schoolteachers were also consulted on the appropriateness of translation. For the Number Knowledge and Balance Beam tests, children were seen individually and interviewed in their native language. These interviews took place in a quiet room provided by each school and were conducted by research assistants (native speakers) trained to administer these tasks. The achieve-

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TABLE 1

ACCOUNT OF A TOUR OF THE CONTINENT:
ORDER OF SECTIONS OF POEM, BY MANUSCRIPT[*]

MS VIII Draft	MSS IA,[†] VII	Ruskin's Line Numbering, MSS IA, VIII	MS IX Fair Copy	MS VIII Endpaper List of Proposed Topics	Library Edition	Actual Tour Itinerary
	"Calais" (poem, MS IA)	1-24	Drawing (*Works*, 2:341 n. 1); "Calais" (poem); drawing (*Works*, 2:341 n. 3)		"Calais" (poem; *Works*, 2:341)	Calais
	"Calais" (prose, MS IA)	Unnumbered	Drawing (*Works*, 2:341 n. 4); [Calais] (prose); drawing (*Works*, 2:342 n. 2)		[Calais] (prose; *Works*, 2:341-42)	Saint ~~St~~ Omer
	[Cassel] (poem, MS IA)	25-62	Drawing (*Works*, 2:342 n. 3); "Cassel" (poem); drawing (*Works*, 2:343 n. 1)		"Cassel" (poem; *Works*, 2:342-43)	Cassel ?
			Drawing (*Works*, 2:343 n. 2); [Cassel] (prose); drawing (*Works*, 2:344 n. 1)		[Cassel] (prose; *Works*, 2:343-44)	
	"Lille" (poem, MS IA)	63-112	Drawing (*Works*, 2:344 n. 2); "Lille" (poem); no drawing at end of poem		"Lille" (poem; *Works*, 2:344-45)	Lille

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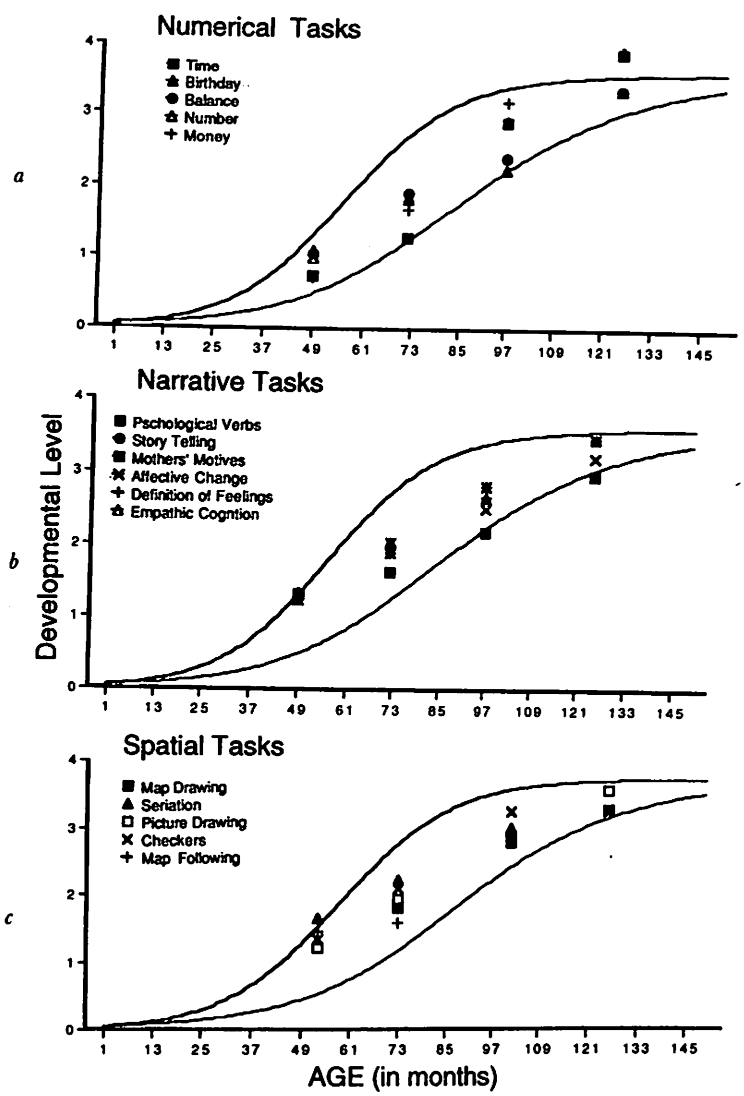

FIG. 34.—Empirical data from the three test batteries, plotted on the same graph as the fastest- and slowest-growing theoretical curves from Fig. 33 above. Note that most of the means fall in the predicted range. *a*, Numerical tasks. *b*, Narrative tasks. *c*, Spatial tasks.

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MS VIII Draft	MSS IA,[†] VII	Ruskin's Line Numbering, MSS IA, VIII	MS IX Fair Copy	MS VIII Endpaper List of Proposed Topics	Library Edition	Actual Tour Itinerary
			Drawing (*Works*, 2:345 n. 2, a drawing heading the prose, not closing the preceding poem, as implied in *Works*); [Lille] (prose); no drawing at end of prose		[Lille] (prose; *Works*, 2:345)	Tournai (340)
	"Brussels" (poem, MS IA)	113-73	Blank space for drawing; "Brussels" (poem); drawing (*Works*, 2:347 n. 2)		"Brussels" (poem; *Works*, 2:346-47)	~~Brussels~~ Bruxelles + Waterloo
			Drawing (*Works*, 2:347 n. 2); [Brussels] (prose); no drawing at end of prose		[Brussels] (prose; *Works*, 2:347-48)	
	"The Meuse" (poem, MS IA)	Unnumbered	Blank space for drawing; "The Meuse" (poem); drawing (*Works*, 2:349 n. 1)		"The Meuse" (poem; *Works*, 2:348-49)	
			[Meuse] (prose); drawing, broadside on whole of recto following prose (*Works*, 2:350 n. 2)		[Meuse] (prose; *Works*, 2:349-50)	~~Namur~~ Namur (340) Liège Spa

mentioned

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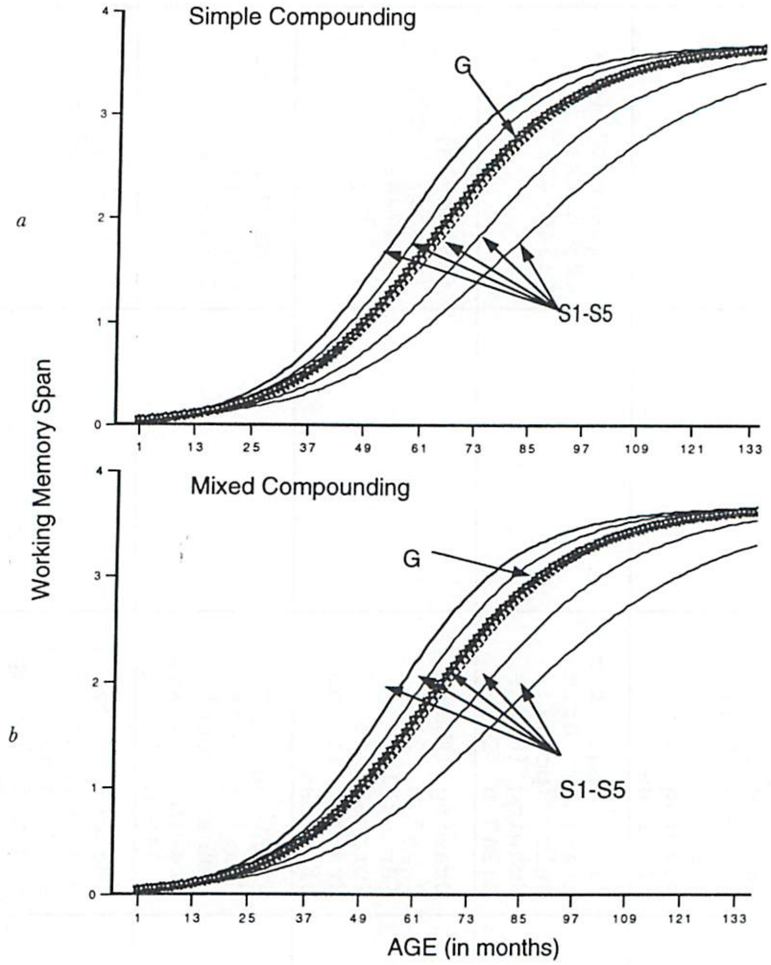

FIG. 33.—Theoretical models for a situation where several different specific numerical understandings all contribute to the growth of a central conceptual understanding but are limited by a working memory capacity that grows from .05 to 4 units. The model that has been used in panel *a* is the simple compounding model with an externally fixed carrying capacity that grows in the same manner as the (empirically derived) constraints on children's working memory (see Fig. 39 below and App. E). Panel *b* depicts a similar situation, where the reciprocal contribution of the general understanding is not simple but conjoint.

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MS VIII Draft	MSS IA,† VII	Ruskin's Line Numbering, MSS IA, VIII	MS IX Fair Copy	MS VIII Endpaper List of Proposed Topics	Library Edition	Actual Tour Itinerary
			Blank verso; drawing (*Works*, 2:350 n. 2); "Aix la Chapelle" (prose); blank space for drawing between "Aix la Chapelle" and "Cologne"		"Aix la Chapelle" (prose; *Works*, 2:350-51)	Aix-la-Chapelle (Aachen)
			"Cologne" (poem); drawing (*Works*, 2:351 n. 3)		"Cologne" (poem; *Works*, 2:351)	Cologne
			[Cologne] (prose); no drawing at end of prose		[Cologne] (prose; *Works*, 2:351-53)	?
	"Andernacht" (poem, MS IA)	378-403	Blank space for drawing; "Andernacht" (poem)		"Andernacht" (poem; *Works*, 2:354 n.) 355	[~~Andernacht~~] Bonn, Godesberg, Drachenfels, Andernacht
"Andernacht" (prose)		Unnumbered, composed following [Arve at Chamouni], 520-64	Drawing (*Works*, 2:354 n. 2); [Andernacht] (prose); no drawing at end of prose		[Andernacht] (prose; *Works*, 2:354-55)	

that the general curve receives from the specific curves (formally represented as $k_{S_1>G}$, $k_{S_2>G}$, etc.). According to the psychological model, (*a*) specific structures for which the level of understanding is high should have a greater influence on general understanding than those for which this level is low, and (*b*) the absolute level of general understanding should not exceed that of the highest specific function. One way to ensure that the first condition is obtained is to let k for any specific curve be a function of its own growth rate. In the present case, k will be set, somewhat arbitrarily, at GR(S) − 1. In order to ensure that the second condition is met, the reciprocal contribution that the general structure makes to the more specific structures ($k_{G>S_1}$, $k_{G>S_2}$, etc.) will be set at a value that is equal to the average of the specific growth rates. This value will be assumed to be the same for all curves so as to reflect the fact that the influence of the general function is presumed to be constant across specific tasks. (Being able to count mentally, e.g., should make just as big a contribution to a task that a child is thoroughly familiar with as it does to one of lesser familiarity, providing that both tasks require this competence.)

Finally, consider the rate at which the specific understandings are acquired, GR($S_1, S_2, \ldots, S_x$). There is no available theoretical basis for making decisions about the absolute values of these parameters; however, as indicated in the earlier discussion, it is clear that these values must vary substantially from task to task. For convenience, I use the same values that were used in explicating the mathematical models, namely, 8%–4%.

Entering all these parameters into the first mathematical model (i.e., the model for growing K with simple compounding) yields the pattern of specific and general growth shown in Figure 33*a*. Substituting the same parameters into the second mathematical model (i.e., the "mixed" model with simple bottom-up compounding but conjoint top-down compounding) yields the pattern of growth shown in Figure 33*b*. As may be seen, the two patterns are quite similar. The difference between them lies in the rapidity of acceleration of all curves during the preschool period and the extent to which the specific curves diverge from each other during the dimensional period.

COMPARING THE THEORETICALLY DERIVED GROWTH CURVES TO THE EMPIRICAL DATA

Figure 34 compares the fastest- and slowest-growing specific curves generated by the model (i.e., those with growth rates set at 8% and 4%) to the mean scores that were reported in Chapters III and V for the numerical, narrative, and spatial batteries. As may be seen, the great majority of means obtained at each age (total $N = 60$) fall within the bounds specified by the

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MS VIII Draft	MSS IA,[†] VII	Ruskin's Line Numbering, MSS IA, VIII	MS IX Fair Copy	MS VIII Endpaper List of Proposed Topics	Library Edition	Actual Tour Itinerary
			Drawing (*Works*, 2:356 opp.); "Ehrenbreitstein" (poem); drawing (*Works*, 2:358 n. 1)		"Ehrenbreitstein" (poem; *Works*, 2:355-58)	Ehrenbreitstein Coblentz? (351)
			Space for drawing; [Ehrenbreitstein] (prose); no drawing at end of prose		[Ehrenbreitstein] (prose; *Works*, 2:358)	
	"St. Goar" (poem, MS IA)	404-29	Space for drawing; [St. Goar] (poem); no drawing at end of poem (*Works*, 2:360 n. 1 in error)		[St. Goar] (poem; *Works*, 2:359 n. 1)	St Goar
[St. Goar] (prose)		Unnumbered, composed following "Andernacht" (prose)	Space for drawing; [St. Goar] (prose); no drawing at end of prose		[St. Goar] (prose; *Works*, 2:360-61)	

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from specific experience undergoes a profound transformation, the conjoint compounding model might be most appropriate. One might want to make the "top-down" contribution a joint function of the two levels so that it would accelerate as the child's general understanding level climbed from a predimensional to a unidimensional value (i.e., from 1 to 2 units). If one assumes that the general structure makes an important contribution to all the specific structures, even in its predimensional form, then one would want to use the simple compounding model for both the bottom-up and the top-down contributions.

The most conservative assumptions are those of the simple additive model. However, the multiplicative model is also a reasonable possibility. Thus, in the sections that follow, I consider both cases.

Selecting Parameters for the Models

With a general mathematical model in mind, one must next select a set of parameters to plug into it. Consider first the carrying capacity (K). In the examples that were developed in the previous section, the carrying capacity for the growing K models was arbitrarily set at 10 for the constant capacity models and at a value that grew from 1 to 10 in a logistic fashion for the growing K models. In the context of neo-Piagetian theory, the carrying capacity of a developing system is identified with its information-processing capacity or mental power, which in turn is presumed to be estimable from the size of its working memory. As shown in Appendix E, children's working memory grows during the age range of interest and is well fit by a curve whose carrying capacity is 1 at the age of 4 and 3.7 at the age of 10 and that shows a monthly growth rate of 4.5% during the interim. Accordingly, it is these values that I plug into the set of equations specified in equation (13) for the value of K_t.

Consider next the growth rate that is assumed for the general curve, GR(G). In the present model, what this parameter represents is that part of the growth of children's general understanding that is independent of any specific understanding, for example, the sort of growth that might occur if children consciously reflected on their general knowledge of numbers, without any specific instantiation in mind. Piaget hypothesized that this sort of general reflectivity did not appear until the teenage years. Since I have seen no data to suggest anything different, I have followed Piaget's lead in this regard and set the growth rate of the general function at 0. From a psychological point of view, the effect of this decision is to guarantee that growth in children's general understanding takes place *only* when it is prompted by some more specific form of conceptual activity.

Consider finally the weights that should be assigned to the contributions

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MS VIII Draft	MSS IA,' VII	Ruskin's Line Numbering, MSS IA, VIII	MS IX Fair Copy	MS VIII Endpaper List of Proposed Topics	Library Edition	Actual Tour Itinerary
			Drawing (*Works*, 2:360 n. 1, erroneously cited as following [St. Goar] poem); [Heidelberg] (poem); space for drawing on two-page spread, each page half-filled with poem; no drawing at end of poem		[Heidelberg] (poem; *Works*, 2:361-64)	
			Blank page; new recto with space for drawing; [Heidelberg] (prose), incomplete		[Heidelberg] (prose; *Works*, 2:364 ["Most beautiful . . . granite, sometimes"]	
			Blank verso; drawing (*Works*, 2:364 n. 1 [no. 1])			
			Blank verso; drawing (*Works*, 2:364 n. 1 [no. 2])			
			Blank verso; drawing (*Works*, 2:364 n. 1 [no. 3])			

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The equations for the other models would all have to be rewritten in a parallel fashion. Figure 32 shows the growth curves that would result with the reciprocal contribution of the general curve to all specific curves set at 5% and all other parameters held constant. The important thing to note is the difference between this figure and Figure 31 above. The two major changes—which indicate the effects of the reciprocal linkage—are (1) that the development of all the curves is accelerated (since they all receive additional input) and (2) that the specific curves are more closely "tied" together (since the rapid growth that takes place in the faster-growing curves is passed on, through the mediation of the general curve, to the more slowly growing curves).

MODELING THE PROCESS OF GENERAL AND SPECIFIC GROWTH AS CONCEIVED IN THE PRESENT *MONOGRAPH*

With the foregoing mathematical models in hand, I now return to the psychological question with which I began the present chapter, namely, how to model the relation between specific and general growth in development. In the model that I proposed, each of a number of specific understandings (e.g., time, physical causality, social causality, commercial transactions, school math, etc.) makes a contribution to the growth of a central conceptual understanding (e.g., of number), and this central conceptual understanding in turn makes a contribution to each of several more specific understandings. Clearly, the equations necessary to embody this model are those in which there is a reciprocal linkage between a number of specific curves and a general curve. The only questions are, Which of the six mathematical models that I have described best captures the assumptions of the psychological model? and, What values should be chosen for the various parameters that the equations contain?

Selecting a Mathematical Model

The psychological model that I favor is one that, in the neo-Piagetian tradition, assumes that the child's information-processing capacity is limited and that it grows in a fashion that is independent of any specific or general understandings that are being modeled. For this psychological model, the most appropriate mathematical model is the growing capacity model. Whether the simple or the conjoint version of this model is used depends on what assumptions one makes about the contribution of the general and specific processes at different levels of development. If one assumes that, once the unidimensional structure is assembled, the child's ability to profit

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