

Correspondence between some life-span, stage theory developmental sequences of stages and levels

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ABSTRACT

Good comparisons of development sequences have been made in the past. The model of hierarchical complexity is one developmental sequence which has often been compared to other developmental sequences including: Piaget & Inhelder (1969); Fischer & Bidell (1998); Colby and Kohlberg's (1987a, 1987b) 9 point stages and moral maturity scores (MMS) of moral judgment. However, Colby and Kohlberg's 13 point scale has never been assessed in making comparisons to other scales. The current paper constructed a comparison table of all five models, including Colby and Kohlberg's 13 point scale, which together cover the developmental stages of an entire life-span. Adjustments had to be made to the 9 point and 13 point scales. The formula, $OHC = 3 + 2 * (\text{Stage of Colby \& Kohlberg's})$, was introduced to demonstrate the relationship between the orders of hierarchical complexity and Kohlberg's stages of development.

KEYWORDS: developmental stages, sequence, model of hierarchical complexity, moral judgment, Kohlberg, Piaget, moral maturity scores, Fischer, conversion, cognitive

There are many good comparisons of developmental sequences from the perspective of different theories. However, they do not cover an entire life-span. Commons, Trudeau, Stein, Richards, & Krause (1998) constructed a table showing the relationship among stage models including the models of Commons, Richards and Armon, 1984; Commons et al. (1998); Fischer and Bidell (1998), Colby and Kohlberg (1987a, 1987b); Case (1985), Campbell and Bickhard (1986); and Piaget and Inhelder (1969). More recently, Dawson-Tunik, Commons, Wilson and Fischer (2005) constructed a comparison table of development sequences comparing developmental stages of Dawson-Tunik (2004), Piaget and Inhelder (1969), Fischer and Bidell (1998), Commons et al. (1998); Colby and Kohlberg's (1987a, 1987b) 9 point scale; Armon (1984); and King and Kitchener (1994). Among these models, Colby and Kohlberg's (1987a, 1987b) 9 point and 13 point scales have been widely used (e.g. Kegan, 2002) as Kohlberg's theory expands on Piaget's work. Kohlberg determined that the process of moral development was primarily concerned with justice, and claimed that it continued throughout an individual's lifetime (Kohlberg, 1981). Many comparisons have been made among various stages of development previously but, researchers have only used Colby and Kohlberg's 9 point scale for the comparisons. There has not been any work that shows how Colby and Kohlberg's 13 point scale translates into other developmental sequences. Kohlberg's

model is limited to assessing the development of moral judgment only. The model of hierarchical complexity (MHC) (Commons et al. 1998), on the other hand, is a general stage model that assesses development in any domain. The model helps score how hierarchically complex a behavior is (Commons, Trudeau, et al. 1998). It has 17 developmental stages. This paper shows the correspondence among orders of hierarchical complexity (OHC) and the 13 point scale of moral judgment, the corresponding 9 point scale, Fischer and Bidell's cognitive development level and Piaget and Inhelder's cognitive development stages. These five models of development were chosen because the stages in these models cover the developmental processes that occur in an entire life-span of an individual. Other developmental models were excluded as they do not cover the entire life-span. There have been several tests that validate these models. Here, we construct such a comparison that goes lower and higher than those in the literature cited above.

» THE CORRESPONDENCE TABLE

Table 1 presents the stages of the model of hierarchical complexity (MHC) and the corresponding stages of Fischer and Bidell (1998), Piaget and Inhelder (1969), Colby and Kohlberg's (1987a, 1987b) 9 point scale and 13 point scale and their respective moral maturity scores (MMS). MMS was described by Colby et al. (1983) as a measure of the moral judgment stages. The score is a continuous variable representing the proportion of moral reasoning done by individuals at each stage of Kohlberg multiplied by the ordinal

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number of that stage. For example, an MMS of 200 indicates that all of the individual's reasoning is at stage 2 of the 9 and 13 point scales of moral judgment and an MMS of 300 indicates that all of the individual's reasoning is at stage 3 of the 9 and 13 point scales of moral judgment. However, in the current paper, the distribution of the MMS to the stages of Kohlberg and descendants has been adjusted. The stages of Fischer and Bidell, and Piaget & Inhelder that correspond to the orders of hierarchical complexity were adapted from the conversion tables provided by Commons, Trudeau, Stein, Richards & Krause (1998) and Dawson-Tunik, Commons, Wilson, & Fischer, (2005). The conversion of Kohlberg and decedents' 9 point scale of moral judgment and 13 point scale of moral judgment into the orders of hierarchical complexity (OHC) was made on the basis of the following three assumptions.

1. Model of hierarchical complexity is model that measures development and shows sequence of actions for a task. There has been a lot of empirical evidence that substantiates not only the face validity of this model, but also the extremely high predictions of Rasch scaled performance from the orders of hierarchal complexity of tasks—up to $r = .984$ (e.g. Commons et al., 2014, Commons et al., 2008, Commons et al., 2006).
2. 50 point rule: The moral maturity scores (MMS) of each order of hierarchical complexity are 50 scores apart. For example, an MMS of 100 indicates that an individual is performing at stage 5. An MMS of 150 indicates that an individual is performing at stage 6. An MMS of 200 indicates that an individual is performing at stage 7 and so on. Hence, as orders of hierarchical complexity increase by 1, the corresponding MMS score increases by 50 points. As Pascual-Leone (1972) showed, all the half stages of Piaget and therefore of Kohlberg are really full stages. Thus, each half stage of Kohlberg would be 50 MMS apart.
3. The model of hierarchical complexity (MHC) applies to Inhelder and Piagetian (1958) theory of stage that two or more lower order actions constitutes one action of a higher order of complexity. Those actions have to be coordinated. However, MHC also adds that the ordering of the lower order actions should be non-arbitrary.

The conversion of Kohlberg and descendants' 9 point scale of moral judgment to the orders of hierarchical complexity was derived by scoring the definitions used in Kohlberg's moral judgment instrument. If it was not absolutely clear, the example from the Colby and Kohlberg manual was used. The equation was:

$$3 + 2 \times (\text{stage number of 9 point Colby and Kohlberg}) = \text{OHC}$$

Here, 2 and 3 are constant numbers. The constant 3 aligns the OHC and Colby and Kohlberg stage. Multiplying by 2 converts the half stage numbers of Kohlberg stages that were really full stages into full number.

There were only a few major changes made on the 9 point scale. On the high end, stage 4/5 was scrapped from Kohlberg's stages because stage 4 of Kohlberg corresponds to Systematic stage (Stage 12) of MHC and the transition to stage 5 of Kohlberg corresponds to metasytematic stage (stage 13) of MHC. According to the 50 point rule for MHC, stages 12 and 13 of MHC are supposed to be 50 MMS apart which means that stages 4 and 5 of Kohlberg would also have to be 50 MMS apart. However, according to Kohlberg,

stages 4 and 5 of the Kohlberg stages are 100 MMS apart. Also, following the 50 point rule, the half stage, 4/5, of Kohlberg's had to be scrapped. Sonnert and Commons (1994) found that Stage 5 and 6 were actually part of a single stage and were consolidated into a single stage 6 which has an MMS of 500. Thus, new moral maturity scores were assigned to stages 5 and 6 of the 9 point scale to preserve the consistency of the 50 point rule. For example, according to Kohlberg and his descendants, stage 5 is assigned 500 MMS, stage 6 is assigned 600 MMS and so on. However, after our adjustments, stage 5 of the 9 point scale was assigned 450 points, stage 6 was assigned 500 points and stage 7 was assigned 550 points.

Three higher stages were introduced, including most importantly the paradigmatic stage 14 which is stage 6 in Colby and Kohlberg's stages of moral judgment (Sonnert & Commons, 1994). Kohlberg's speculative stage 7 did not meet any of the stage considerations required for hard stages or for the MHC. Thus, it was rejected. The stage 7 of Colby and Kohlberg in Table 1 was an added stage which corresponds to the cross-paradigmatic stage 15 of OHC. Similar adjustments were made to the 13 point scale. On the low end of the scale, below stage 1 (Colby & Kohlberg, 1987), almost everything had to be redone. We again applied the 50 point rule to the corresponding orders of hierarchical complexity. Colby & Kohlberg's stages begin at stage 1. Stage 1 of Colby and Kohlberg corresponds to stage 5 of the MHC. Thus, we extended the Kohlberg stages down to stage (-1/-2) using the 50 point rule of MMS.

The 9 point scale and the 13 point scale refer to the same stages of moral judgment. They differ only in the way their substages were divided. For example, on the 9 point scale, the transitional stage between 2 and 3 is 2/3 whereas in the 13 point scale, the transitional stages between 2 and 3 are 2(3) and 3(2). The stages on the 9 point scale are divided by half whereas the stages in the 13 point scale are divided by one third. Thus, the conversion of 13 point scale of moral judgment to the stages of model of hierarchical complexity was induced by following the 50 point rule.

It is also important to note that there are stages in the Colby and Kohlberg's 13 point scale that do not correspond to the MHC stages and are between the MHC stages (e.g. 1(2) between MHC stages 6 and 7; 2(1) between MHC stages 7 and 8). These 13 point scale stages are not really stages, but could be possible transitional from one stage to the next.

» CONCLUSION

In this paper, a correspondence table that compares five life-span developmental sequences was presented. In addition, their corresponding moral maturity scores were also given. The table included the orders of hierarchical complexity, Fischer and Bidell's (1998) stages of cognitive development, Piaget and Inhelder's (1969) stages of cognitive development, Colby and Kohlberg's (1987a, 1987b) 9 point scale of moral judgment and Colby and Kohlberg's (1987a, 1987b) 13 point scale of moral judgment. Adjustments were made to Colby and Kohlberg's stages. The 13 point scale of Colby and Kohlberg was presented in a correspondence table for the first time. This table allows one to intelligently use Kohlberg's scoring manual and easily see how stages of different stage models of developmental sequences correspond to each other. ■

Table 1. General description of sequence

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Discriminations	Order of hierarchical complexity Commons et al. (1998)	Fischer & Bidell's stages of cognitive development (1998)	Piaget & Inhelder's stages of cognitive development (1969)	9 point scale of moral judgment Colby and Kohlberg (1987)	13 point scale of moral judgment Colby and Kohlberg (1987)	Moral maturity scores
Calculatory	0					
Automatic	1	-1**		-1/-2**		-150
Sensory or motor and not both	2	0		-1**	-1(-2)**	-133.33
Circular sensory motor	3	1	a Sensorimotor	0/-1**	-1**	-100
Sensory motor	4	2	b Sensorimotor	0**	-1(0)**	-66.66
Nominal	5	3	Ia Preoperational	0/1**	0(-1)**	-33.33
Sentential	6	3-4*		1	0**	0
Preoperational	7	4	Ib Preoperational	1/2	0(1)**	33.33
Primary	8	5	Ila Preoperational	2	1(0)**	50
Concrete	9	6	Ilb Concrete operational	2/3	1(2)	66.66
Abstract	10	7	IIa Concrete operational	3	2(1)	100
Formal	11	8	IIb Formal operational	3/4	2(3)	133.33
Systematic	12	9	IIc Formal operational	4	3(2)	150
Metasystematic	13	10	Postformal**	5*	2(1)	166.66
Paradigmatic	14	11*	Postformal**	6*	3(4)	200
Cross-paradigmatic	15	12*	Postformal**	7**	4(3)	233.33
Meta-paradigmatic	16	Non-existent	Not observed		4(5)*	250
					5*	266.66
					5(6)*	280
					6*	300
					6(7)*	333.33
					7**	350
					7(8)**	366.66

Notes: *Speculated stages that correspond to the orders of hierarchical complexity. ** Stages that do not exist in the models but added here based on how they would correspond to the orders of hierarchical complexity.

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