Growth and Regression in Cognitive-Moral Development[1]

Summary

A somewhat delayed yet still unanswered question is taken up: Is cognitive growth in university students, at least temporarily, accompanied by moral regression? This is discussed in the context of the more general question whether university fosters personality development.
The methodological discussion contains a critical appraisal of Kohlberg's research strategies. The empirical research encompasses 844 German university students who were followed-up longitudinally from their first to their fifth semester, using the 'Moralisches-Urteil-Test' (MUT; moral judgment test), which is based on the new methodology of Experimental Questionnaires. Linear and nonlinear analysis of cross-tabulations and of variance components corroborate Kohlberg's hypothesis of an invariant progression of moral judgment competency. Exceptions from this rule may be traced to inadequate designs of assessment methods. A differentiated evaluation of students' moral judgment behavior shows that, when the personal significance of each stage of reasoning is neglected, highly competent individuals may be erroneously perceived as having regressed.

Preface

This paper if part of a broader research into university socialization, into its process, its conditions and its effects. The general research-guiding question is: What supra-professional concepts (Vorstellungen) and competencies do university students, i.e., society's future 'functional elite' (Dahrendorf), develop? Do they acquire only professional or, as they are often called, 'cognitive' skills, or do they, as university since Wilhelm von Humboldt claims, also develop moral competencies which match the 'functional responsibility' of university graduates in society? Do students develop higher judgment competency, 'cognitive rationality' (Parsons & Platt 1973) and greater social responsibility? And, in which way does university education foster this development?
Our research project is organized as a multi-national, longitudinal study. This study, in which five European countries take part, incorporates sociological, educational as well as psychological perspectives. We study the process of socialization in a variety of domains - in the professional, the political, the personal, the educational, and the scientific domain. And, with

1 This chapter has been adapted from my article "Growth and regression in cognitive-moral development" in C. G. Harding, ed., *Moral dilemmas – Philosophical and psychological issues in the development of moral reasdoning*. Chicago, IL: Precedent Publishing Inc.

respect to methods, we have included also a variety of approaches to the assessment and evaluation of data while at the same time attending to the problem of theoretical adequacy (cf., Note 1).

This research is still ongoing. Yet, there is already a large body of findings available which pertain to specific research questions. One of these pertains to the nature and development of moral judgment behavior at the beginning of university education.

State of the Problem

Though observations seem to show that cognitive growth is often accompanied by moral regression, the cognitive developmental theory insists (a) that there is an invariant sequence of moral development which does not allow for exceptions, and (b) that there is a fundamental parallelism of cognitive and moral progress which reinforces not only the need but also the feasibility of educational efforts.

In the late Sixties, a psychological study by Kramer and Kohlberg has indicated that higher education may indeed induce 'moral regression', and not moral growth. It is reported that "between late high school and the second or third year of college 20% of our middle class sample dropped or retrogressed in moral maturity scores" (Kohlberg & Kramer 1969, p. 109). Only for prison inmates a similar phenomenon has been observed.

Psychologists, Kohlbergians as well as anti-Kohlbergians, have since frequently discussed this finding, as it is clearly at odds with the core assumption of stagewise invariant cognitive-moral development. Because of this finding, some have proposed a revision or even a substitution of Kohlberg's original stage scheme (cf., Broughton 1970; Kohlberg 1973; Gilligan & Kohlberg 1973; Holstein 1976; Gibbs 1977; Murphy & Gilligan 1980; Eckensberger 1983).

For socialization theory, this finding has gained yet an additional meaning. In the face of moral failures of society's functional elite in the past, as has been documented, for example, in 'The Decline of the German Mandarins' by Fritz Ringer (1969), or in 'The Dissenting Academy' by Theodore Roszak (1967), and also in the face of severe problems before us, like economical crisis, social injustice, and nuclear threat, this a considerable amount of moral regressions would indicate an alarming deficiency of our educational system. If this were the case, one would have to consider consequences for educational policy. How can this deficiency be remedied? Does this finding support the diagnosis of a total failure of the public educational system, or does it give differentiated hints for a reform of the university system?

Unfortunately, neither the data-base nor its interpretations are unambiguous, and, hence, any derivation for educational policy must rely on insecure assumptions. The cognitive-developmental approach suggests not only new assumptions, or hypotheses, but in some respects it requires a new methodology to gain appropriate categories of data (cf., Kohlberg 1969, p. 347; Broughton 1978).

Methods always inhere substantial assumptions which in the case of conventional psychometrics may contradict the very theory the method is to serve. Hence we should not enter straight into data comparison but stay a little with the methodological problems of our research question.

Any attempt to achieve a consistent and empirically valid statement on the factual course of cognitive-moral development has to address simultaneously three sides of the problem, the conceptual framework, the methodological decisions and the empirical evidence.

If one follows up the history of the debate on the Kohlberg and Kramer data, we find several lines of reactions. Kramer and Kohlberg's own reaction is noteworthy in different respects: (1) they do not conclude that this finding was contradicting cognitive-developmental theory, (2) they neither question the scoring method, and (3) they give compelling theoretical explanations for these regression cases, though these were not solely derived from cognitive-developmental theory, but were borrowed from Perry's (1970) work on ethical and cognitive development and from Erikson's (1966) theory of identity crisis and ego development.

Kohlberg and Kramer speculated that moral development, in the sense of structural transformations, may terminate at the end of childhood, while ego-functions become more important. According to this explanation, regression is not structural, but only a temporary, functional phase "in the service of the ego." It should be considered as normal for the life-phase of identity crisis and "psychosocial moratorium, in which new and non-conforming patterns of thought and behavior are tried out" (Kohlberg & Kramer 1968, p. 116). However, such an eclectic use of different conceptual frames diminishes the explanatory power of the cognitive-developmental theory.

There are two other lines of reasoning. The first group suggests a modification of the Stage model to meet the postulate of invariant developmental order. The second group instead suggests to keep, or to extend, the Kohlbergian concept as a common frame of reference, and modify either the methods of assessment or the empirical propositions of the theory.

The first group argues that the Kramer and Kohlberg findings do not only falsify the hypothesis of general invariant developmental sequences, or certain assessment methods, but more dramatically the complete conceptual framework. Consequently, the advocates of this proposition reject the original Kohlberg Stage model, and put up new conceptual framework, to meet more perfectly the postulate of sequential order (cf., Gibbs 1977; Haan 1978; Eckensberger & Reinshagen 1980; Murphy & Gilligan 1980; Lempert 1982). Kohlberg himself has altered his system considerably, though, by and large, he kept the Stage descriptions which one may view as the core of his paradigm (Colby, Kohlberg et al. 1983).

For reasons which we dealt with in detail elsewhere (cf., Note 2), we favor the second line of thinking. We have to choose between two divergent interpretations of the Kohlberg and Kramer data: Can we conceive of them as indicating a true regression in moral development, or do they rather conceal cognitive-moral progression which is actually inverted because of mistakes of research method?

What facts are available for deciding between these two interpretations? As has been stated before, in the early paper by Kohlberg and Kramer (1969), the temporary lowering of Stage scores in some of the college students has been taken as true regression in moral development. However, while in late adolescence there may be a considerable increase of *use* of lower Stage reasoning in moral interview situations, a real decrease of *competency* of moral judgment from Stage 5 to Stage 2 would have to be considered a falsification of a central hypothesis of cognitive developmental theory.

Therefore, some psychologists, including Kohlberg, have preferred to carefully reanalyze the theoretical validity of the employed methods before accepting these data as a sign of developmental inversion. This cannot mean to accept any method that produces the desired findings - the theory would become immune against any empirical critique. It means to reconsider the method on theoretical grounds to possibly detect inadequacies which may account for a false impression of regression.

In reconsidering his research method in his publications since 1973, Kohlberg has identified the original coding system as the major source of measurement error. In his opinion, it has failed to distinguish clearly enough between 'content' and 'structure' (Kohlberg 1973, p. 191; 1976, p. 43). Hence, he and his colleagues at Harvard have completely revised the coding system.

However, the success of these revisions may be questioned for some reasons. First, though the data are now much better in line with the hypothesis of invariant sequence, there is still a considerable number of persons who appear to regress (Colby, Kohlberg et al 1983; see also Murphy & Gilligan 1980, p. 91). Hence, the theory remains seriously challenged. As Kohlberg has stated with admirable courage, already "a single case of longitudinal inversion of sequence disproves the stage theory if it is not a manifest case of measurement errors" (Kohlberg 1973, p. 182).

Second, the revision is confined to the method. Kohlberg and his group have recorded sample interviews on a intuitive basis (cf. Colby, Kohlberg et al. 1983), instead of explicitely restating their theory from which the method ought to be deduced.

The centrality of this question, for cognitive-developmental theory as well as for practical problems in higher education, has let us decide to reconsider the problem of methodological adequacy once again. We still do not know, whether the important distinction of content and structure is the true core of the problem. We suspect that the problem of an operational definition of what 'structures', and relational properties, of judgment behavior mean is not yet adequately solved (cf., Note 3).

Aside from this, some believe that 'regression' may be not so much because of coding problems, but rather because of other insufficiencies of the assessment procedure. Already in 1970, Broughton has pointed at problems of design and conduct of moral interviews, in particular, at a "general lack of probing." Because of a lack of relevant information the psychologist may easily be misguided to rate any instrumentalistic answer as a Stage 2 concern

(cf., Note 4). Indeed, as Döbert and Nunner-Winkler (1975, p. 126-131) have clearly demonstrated, instrumentalism is not unambiguously related to reasoning on Stage 2. Some subtypes of instrumental reasons can also be found in postconventionals, i.e., in Stages 5 or 6 subjects. For example, instrumentalist reasons may turn up in postconventionals who argue "cynically," or in those who purposively understate their moral concerns in particular situations such as the interview situation.

Though being of hypothetical nature, usually the presented moral dilemmas get the respondent really involved, and make him or her think on the highest available Stage of moral judgment. Yet, the interview situation may sometimes fail to elicit this involvement, so that the conversation remains superficial. In this case the respondent may feel little compelled to use 'high sounding' reasons for defending his opinion on the dilemma.

When reading some of these interviews, one wonders whether the respondent would keep up his instrumentalistic reasons when we would ask him to compare their acceptability with a sample of his own Stage 5 reasons. Unless he or she would really prefer instrumental morality over principled reasoning, we conceives of this phenomenon as a sign of non-moral factors (such as cynicism and understatement), or as a sign of a more differentiated cognitive-moral structure.

For this question it may be misleading to merely count the number of times that a Stage-typical concern was uttered. Often we might detect that the frequency of a statement does not correlate with its subjective significance. If the interview, or the computation of the individual's total score, is not designed to take this into consideration then non-moral utterance may be mistaken as moral judgment behavior, wrongly producing the impression of regression. For this purpose, preference tests may produce important informations beyond the data gained by interview methods.

The Konstanz Study

Hypotheses. As part of a more comprehensive research into the condition, process, and result of university socialization, this study is designed to recapitulate the phenomenon of moral regression. We have hypothesized that, if cognitive-moral development is really invariantly progressing, the following three statements should prove to be empirically true:

1. There should be a progressive change regarding the cognitive structure of moral judgment behavior. Over the time of two years of university study, the students will develop a higher competency to judge social dilemmas in accordance with moral principles.
2. When asked to directly compare the acceptability of different stage-typical arguments, the preference of instrumentalistic, preconventional reasoning may increase but not so much

that it would exceed the significance of post-conventional arguments.

3. In addition, these cases should proof to be pseudo-regressions, and not real regressions, in that they should be confined, as Kohlberg and Kramer (1969) have noted, to those which have already developed a high degree of moral competency.

Only if these three predictions are true, we shall assume the hypothesis of invariant developmental sequence as being empirically valid: Normally, in the absence of pathogenic environments, we could then safely expect that development of moral judgment competency does not invert.

Research Instrument

As stated above, we felt that new kinds of information were needed to investigate these hypotheses. These new informations should specifically help us to single out the preference, or affective aspect of moral judgment behavior and its cognitive-structural, or relational properties.

The 'Moralisches-Urteil-Test' (MUT), the instrument for assessing moral judgment that resulted from these considerations, rests on the concept of 'Experimental Questionnaires'. This newly developed psychometric concept results from an attempt to combine the transparency of questionnaires with the hermeneutic possibilities of multivariate experimental design, in order to enlarge the tools of structural methodology (cf. Note 5).

Unlike the Kohlberg Interview, the MUT asks the individual to directly indicate his preferences for Stage-typical moral reasons. Unlike the interview method, and unlike other kinds of preference tests, it enables us to conduct a simultaneous, but analytically distinct measurement of the two basic aspects of moral judgment behavior: the affective content and the cognitive structure. This way it seems possible to circumvent some of the conceptual dilemmas of the Kohlberg Interview (cf., Lind & Wakenhut 1983), and to gain an unconfounded measure of the cognitive component of moral judgment behavior, which, in classical tests of attitudes toward moral concerns, is mixed up with properties of the measurement instrument.

The individual scores for the *cognitive-structural aspect* have been computed by multivariate analysis of variance components for each individual pattern of judgment behavior. The resulting coefficients of determination are taken to indicate the degree to which moral criterions are cognitively anchored in the individuals' judgment. A scale value of 'zero' means that the respondent's judgment behavior is not determined by moral concerns. A value of 'one hundred' indicates that his or her judgment is completely determined by moral considerations. Since this structural measure is conceptually different from Kohlberg's we have refrained from assigning Stage numbers. Nevertheless, it claims theoretical validity. So far, studies with the MUT have well corroborated its developmental properties, in particular the hypotheses of sequentiality and

of age-relatedness (Heidbrink 1983; Lind 1983 b).
The *affective aspect* is defined, alike classical attitudes, as the direction and the strength of the respondents' affective commitment to Stage-typical moral concerns. For each of the six Kohlberg Stages of moral judgment, we have assessed the degree to which the subject accepts, or rejects, Stage-typical reasons for and against a particular solution of a behavioral dilemma. The test contains two dilemmas, the euthanasia dilemma by Kohlberg and the working men's dilemma which is taken from a German prose.

Sample

The study included a sample of 844 German university students who have given complete data on the MUT, coming from various fields of study: Medicine, German languages, economics, natural sciences, engineering, and social welfare work. Here the first two waves of the longitudinal study, in the first and in the third year shall be considered for analysis.

Findings

The analysis of the data from our 1st to 5th semester longitudinal study of university students gives some clear answers to the question of progression or regression in moral-cognitive development:

1. In general, there is no regression but a slight progression with regard to the cognitive structure of student's moral judgment behavior. Over the time of two years of university study, we cannot expect large progress when measured by the rough six Stages model. Yet there is a small, but noticeable development toward a higher competency to judge social dilemmas by moral principles. The number of students whose judgment behavior has shown a high degree of determination by moral concerns (scale values 50 to 100), raises from 19.4 percent to 22.1 percent. This is a significant increase when considering the developmental scope of the Kohlberg scale.
2. In a number of cases we find what might be called a "pseudo-regression." When asked to directly compare the acceptability of different Stage-typical arguments, some students increase their preference for preconventional reasons, while they lessen their acceptance of post-conventional arguments, too.
3. Moreover, these cases of apparent regressions could almost completely be predicted on the basis of their initial moral judgment competency. They were mostly confined to those who had possessed a high degree of moral sensitivity in the first year of study. This becomes

visible when we divide the total sample into three groups with initially low, medium, and high values on the cognitive aspect scale, and analyze the changes in the pattern of acceptability of the six Kohlberg-Stages by our subjects (Table 1, and Graph 1). This shows that only in the high-group pseudo-regressions occur. The medium group, and more yet the low group, exhibits a pattern of developmental change as is expected by the theory: While their preference of low Stage reasoning decreases, their acceptance of postconventional concerns increases during this two year period. When we take a closer look at the data, we find, as the hypothesis states, that the 'regressive' change in the affective component of moral judgment is only *relative* to the respondent's previous preference. In absolute terms, nearly all students who have increased their acceptability of Stage 2 reasoning still prefer postconventional concerns most, revealing a judgment structure more morally pronounced than that of the other students (Table 2, and Graph 2). (It may be added that, because the changes are group specific, they cannot be discarded as a statistical regression toward an overall mean).

We have submitted the same data to a multivariate, polynomial analysis of variance (cf., Bock 1975) to gain general figures for the degree of linear and non-linear association between the initial cognitive-moral structure and the change of pattern in moral judgment behavior from 1st to 5th semester of study, as well as some information on the statistical significance of this relation. Latter figure is not regarded as central. It is only depicted for conventional reasons, as it would always require a true random sample of equivalent measures which in this and in most other research seems neither feasible nor necessary.
In terms of multivariate, polynomial analysis our major hypothesis states that

1. in general the slopes of the line that connects the acceptability of each stage becomes systematically (that is, linearly) steeper, and that (2) in groups with initially different cognitive structures, this sign of moral-cognitive progress is systematically different, i.e., it deflects from the general line of progress in the highly structured group (cf., Graph 2, third group).
2. The results, not surprisingly, corroborate the findings of Table 1 and Table As Table 3 clearly shows, only the linear correlation between group-membership and change pattern (stage x semester interaction) is substantial ® = 0.39) and significant on the 0,001 level. An additional minor correlation can be found in the cubic polynomial ® = 0.11) which was to be expected because of the limited ranges of the response scales that cause ceiling effects on both ends of the scales. But this also supports rather then contradicts the hypothesis.

Conclusion

First, our finding does not refute, but supports, Kohlberg's hypothesis of invariant sequence.

Like Kohlberg and Kramer's (1969) data and like Rest's (1979) data they reveal that, in general, there is a noticeable progress in cognitive-moral development. In those cases in which the data seem to indicate regressions, all our evidence suggests that these are not true signs of regression. If there was genuine regression we would expect that it may occur in all persons, and would not be confined to the initially highly competent subjects, as already Kohlberg and Kramer (1969) have observed. Furthermore, in that case we had expected that the preferences of the Stages of moral judgment become reversed. However, this is not the case in university students. Their preference of postconventional reasons remains superior to the other groups' preference.

Students' slight devaluation of high Stage reasoning, and their slightly increased preference for Stage 2 reasons may have several causes. They may, therewith, oppose moral oversophistication, or may, as Döbert and Nunner-Winkler (1975) suggest, use cynically instrumentalist reasons. Or, these students may be more differentiated in their moral judgment, what appears as a lowering in their overall scores due to a lack of sensitivity of the method. A more refined evaluation of our data points into this direction. The regression phenomenon seems to be correctly attributed to methodological faults. From a certain point on, cognitive-moral development is easily misinterpreted when using insufficient methods of assessment. But, as our findings suggest, this seems not so much a problem of coding than of research design.

Second, this and other empirical research using the MUT has again shown the usefulness of Kohlberg's Stage scheme of moral judgment (cf., Lind, Hartmann & Wakenhut 1983). We distinguish between the empirical hypotheses contained in this theory and its conceptual scheme. Latter cannot be refuted by empirical evidence because it is presupposed by any empirical research. One may see it as more or less thoroughly constructed, but never as empirically proven or disproved. Kohlberg's six Stages of moral judgment are ideal-types (Max Weber) that exist even though some of these types may not be matched by empirical cases. Even manifest cases of regression would have not provided a cause against it. Though not being empirical, the conceptual scheme of the six Stages has been a valuable basis for research into moral judgment (cf., Broughton 1978; Colby, Kohlberg et al. 1983; Rest 1979).

Our findings do not prove all statements of the Kohlberg theory. Not only empirical data but also theoretical considerations have led us to reconstruct cognitive-developmental theory with regard to the structural whole assumption (cf., Note 3, above; also Lind 1982 b; 1983 c). But we would hesitate to readily exchange this paradigm for less elaborated concepts.

Finally, our finding is also in support of the hypothesis that higher education induces moral progression (cf. also Rest 1979; Colby, Kohlberg et al. 1983). The degree to which this is achieved may not seem sufficient in the face of men's present and future problems. The students themselves almost unanimously complain that, in their view, university courses deal too little with the political and ethical implications of their respective field of study (cf., Dippelhofer-Stiem 1983, p. 108). However, as Kohlberg (1973) has said, the demands and

opportunities that are provided by higher education may be indispensable for the development of moral judgment competency, and, we may add, for the fostering of moral responsibility in society's future functional elite.

Endnotes

1. Pulished in: Carol G. Harding, ed., Moral Dilemmas. Philosophical and psychological Issues in the Development of Moral Reasoning. Chicago, IL: Precedent Publishing Inc. 1985. An earlier version of the paper was presented at the symposium 'Moral and Social Thinking' (Chair: H. Weinreich-Haste). Sixth Annual Scientific Meeting of the International Society of Political Psychology (ISPP), July 19-22, 1983, Oxford University.*Acknowledgment:* The analysis herein was is supported by the Deutsche Forschungsgemeinschaft and the University of Konstanz as part of the research project "Hochschulsozialisation (SFB 23). The project was jointly conducted by Tino Bargel, Barbara Dippelhofer-Stiem, Gerhild Framhein, Georg Lind, Hansgert Peisert (director), Johann-Ulrich Sandberger, and Hans Gerhard Walter. For further details on this research, see e.g. Framhein & Langer, 1983.
2. As, for example, the shrinking of a distance does not falsify length measures such as miles and kilometers, the regression in moral development does by no means falsify the Stage concept. On the contrary, former presupposes latter: speaking of invariant sequences would not make sense if there is no independently defined conceptual framework which can be used as a measure for development. To put up a new conceptual framework (i.e., our measurement system) each time when we find empirical cases of regression, would result in a Babylonian tower of mutually incommensurable Stage concepts. There are other possibilities of reacting. The rejection of the Stage model may be based on a confusion about the epistemological status of the postulate of 'invariant sequences'. In theory, Kohlberg claims that the invariant sequence is an empirical hypothesis about the course of development, which can be disproved in a longitudinal study (cf. Kohlberg 1973, p. 181). However, at the same time he states that the postulate of invariant sequence is part of the definition of stages scores. He argues that the "concept of construct validity implies assignment of individuals to stages in such a way that the criterion of sequential movement is met" (Kohlberg 1976, p. 47). Although we should acknowledge the necessity of defining a new concept of validity, obviously this latter suggestion would turn the hypothesis of invariant sequences into a mere criterion of measurement. It would be true by definition, and hence loose its informational value.
3. Kohlberg employs two fundamentally different concepts of structure which may account for some of the confusion in the literature. In theory, Kohlberg defines structure as the "form or organization of response,"as" greater consistency of structure with itself" or a "integration" (cf. Kohlberg 1973, p. 181; Kohlberg & Kramer 1969, p. 98, p. 118). Structure is sharply distinguished from 'content', which is the "element or the information it contains" (cf. Kohlberg 1973, p. 181; Kohlberg & Kramer 1969, p. 98, p. 118). However, in the new scoring system we find no explicit hint how these relational properties of the pattern of moral judgment behavior are taken into consideration. The coding scheme defines structure in a different manner. Hereafter, structure is equated with a particular kind of content, namely with "criterion concepts" that are "most distinctive of a given stage" (Kohlberg 1976, p. 45). So we are confronted with the somewhat awkward juxtaposition of content which is 'structure' and content which is 'content'. If the 'other' Kohlberg is right then making the scoring system more 'structural', in this sense, is neither feasible nor necessary. For a more extensive discussion cf. Lind 1982 b.
4. In re-analyzing the data of one subject who allegedly regressed from Stage 5 to Stage 2, Broughton found that "the general lack of probing may indeed be responsible for the marked drop out of Walton's stage 5 concern for the welfare of citizens" (1970, p. 6).
5. This method is described elsewhere in more detail (Lind 1982 a; 1983 b; Lind & Wakenhut 1983). On the surface it may resemble classical attitude measurement. It should be noted, that the rational behind is completely different. As an instrument for psychological research this assessment method has to meet the requirement of theoretical validity but not the

criteria of classical test construction. Latter indeed partially contradicts the cognitive-structural theory of personality (cf., Lind 1983 c). In classical test construction, structure and behavioral consistency are solely attributed to the measurement instrument. In our interactionist concept of measurement, these aspects are conceived of as an attribute of the interaction of the instrument (=situation) as well as of the responding person.

Reference Notes

1. Broughton, J. *'College regression' in moral development.* Unpublished manuscript, 1970.

2. The Moral Judgment Test (MJT; German MUT) has been renamed to Moral Competence Test (MCT) in order to align its name with its measurement object.

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Appendix: Graphs and Tables

Group		**'low'**	**'medium'**	**'high'**
Scale:		0-9	10-49	50-100
		n=36	n=496	n=312
Stage of	I	-71	-16	13
Reasoning	II	-62	-12	50
	III	-20	-11	13
	IV	10	-10	-26
	V	65	19	-19
	VI	20	-7	-58

Table 1 Pattern of Relative Change of Moral Judgment Behavior of Students with Initially Different Degrees of Moral Competency (N= 844, Change Scores[2])

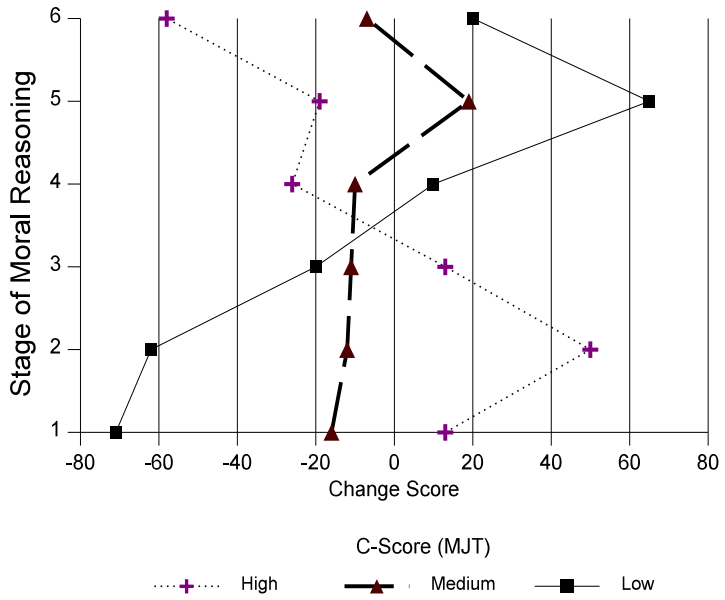

Figure 1 Pattern of Relative change of preferences of Moral Reasoning of students with initially different degrees of Moral determination by Moral Stages (N = 844, Change Scores)

2 The change score is the ratio of positive and negative changes with regard to each Stage-typical reasoning that was to be rated: (I-D)/(I+D); whereby I=positive changes, D=negative changes. A positive number indicates a surplus of increase in acceptability, a negative number a surplus of decrease.

Moral-cogn.Structure	Semester	Mean Acceptability of Stage ... (Q25, Q50, Q75)					
		1	2	3	4	5	6
Low n= 36	1st	12.7	11.0	11.8	13.9	15.4	15.7
		14.5	14.3	14.7	16.8	16.5	18.5
		16.5	17.0	16.9	17.8	19.0	19.4
	5th	8.2	6.8	9.8	13.5	17.5	17.5
		10.3	10.2	13.5	15.8	19.1	18.9
		13.5	14.0	15.3	18.5	21.1	22.2
Medium n=496	1st	6.1	4.7	7.4	12.3	17.0	17.6
		8.8	8.0	10.6	15.3	19.8	20.3
		11.8	11.1	13.9	17.8	22.3	22.7
	5th	4.6	3.9	5.9	11.8	17.8	17.4
		7.8	6.7	10.0	14.7	20.3	19.9
		11.0	9.9	13.7	17.4	23.2	22.8
High n=312	1st	1.8	1.9	3.9	12.2	20.5	21.1
		4.9	4.5	7.5	15.5	23.3	24.1
		7.6	7.2	10.8	18.8	25.8	26.3
	5th	2.1	2.2	4.2	11.7	19.1	18.2
		5.6	4.7	8.0	14.6	22.1	21.2
		8.5	7.4	11.9	17.1	24.6	24.3

Table 2 Pattern of Absolute Change of Moral Judgment Behavior of Students with Initially Different Cognitive-Moral Structure (Quartile, median; n=844, complete data)

	Source of Variance	Sum of squares	Residuals	F-value	df1	df2	P-value	Determ. Correl.
Stage x Semester	*1	1996.3	10904.8	76.98	2	841	0	1540393
	*2	21.8	7644.6	1.20	2	841	301	20053
	*3	72.2	6081.9	4.90	2	841	7	110108

Note: Polynomials of the interaction of stage and semester.

Table 3 Pattern of Absolute Change of Moral Judgment Behavior in Students with Initially Different Cognitive-Moral Structure: Multivariate Analysis of Variance, Contrasting Polynomials (n=844, complete data)

Figure 2 Pattern of Absolute change of preferences of Moral Reasoning of students with initially diefferent degrees of moral structuredness (n = 844, Meridian and Quartiles)