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ABSTRACT

A study focused on the relationship between emotions and literacy achievements. It begins with a mention of the theoretical contributions which backed up the study. In the Dudelange project survey (4th graders), the following literacy variables are available: word recognition, two different measures for reading comprehension, spelling, vocabulary and structuring. On the emotion side data were collected on: anxiety, test anxiety, school reluctance, stress, stress coping strategies, effort avoiding, zeal, self-concept. In a first step, two indicators were constructed: the first one concerning literacy, the general literacy factor, has been obtained by means of factor analysis. The second one concerns students' emotional situation. Data have been reduced in two ways: by factor and by cluster analysis. With regard to their emotional situation in school, clustering assigns students to one of the following five groups: helplessness, hostility, defense, realism, optimism. Results indicated a strong relationship between both parameters. It concludes with prospects for further research and conclusions drawn concerning both the theory of reading and practical consequences for the everyday work in schools. (Contains 14 references, and 20 tables and 12 figures of data.) (RS)

Running head: LITERACY AND EMOTIONS

Literacy and Emotions: Data Analysis from the Dudelange Project

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Abstract

The present contribution focuses on the relationship between emotions and literacy achievements. We'd first like to mention the theoretical contributions which backed up our work. In the Dudelange project survey (4th graders), the following literacy variables are available: word recognition, two different measures for reading comprehension, spelling, vocabulary and structuring. On the emotion side we have collected data on: anxiety, test anxiety, school reluctance, stress, stress coping strategies, effort avoiding, zeal, self-concept. In a first step, we construct two indicators: the first one concerning literacy: the general literacy factor, has been obtained by means of factor analysis. The second one, the concerns students' emotional situation. Data have been reduced in two ways: by factor and by cluster analysis. With regard to their emotional situation in school clustering assigns students to one of the following five groups: helplessness, hostility, defence, realism, optimism. We discover a strong relationship between both parameters. At the end we mention prospects for our further research and we draw conclusions concerning both the theory of reading and practical consequences for the everyday work in schools.

Introduction

The aim of the following exploratory outline of a study concerning literacy and emotions is less to inform about research results than to discuss the rationale of the study. Therefore the quantitative elements still have to be affined, and we have just started the qualitative analysis. We will begin by briefly mentioning the evolving theoretical underpinnings which guided the planning of the study.

Theory

The theoretical path of our work went from cognitive modelling of the reading acquisition process to the involved intervention in environments where literacy thrives. We found models from the early nineties by authors such as Ellis & Young (1989), Van Grunderbeeck (1994) and Graf (1994) to be very convincing at first and we made positive experiences with these conceptual tools while studying reading difficulties of individual children. But we soon encountered several problems. The acceptance by practitioners was very low and it was impossible to develop corresponding educational practices. Moreover, we found very few hints on the frequency of different types of reading problems, as this kind of inquiries mainly followed an experimental or a clinical design and gave no broad pictures of reading problems in schools. Finally, the aspect of word reading was well covered, whereas there was only little information on literacy development as a complex socialization process including especially high leveled comprehension as well as interaction with the sociocultural background. So, although we had started with a study of the reading process, working in an interdisciplinary group with a lot of close contacts with practitioners, soon made us aware of the necessity to overcome traditional subdivisions of reading research, which e.g. Colin Harrison (2000, 17) has described for the British scene with the following words: "[...] research into reading processes has been carried out by psychologists, and research into

practice has been carried out by scholars in university schools of education, whereas policy driven research has been directed and funded by government agencies". Consequently, we developed an alternative way. We studied examples from the whole of literature on teaching reading which emphasize learning and social environments such as families, classrooms, schools. We learned that it was important to scratch the surface of the complexity inherent in classrooms and learning contexts (Cambourne 2000, 514) and that one of the important aims is to give schools the means to create new literacy classrooms (Kist 2000, 711). More and more we became aware that representing reading as situated cognition made it necessary to meet the actual needs of practitioners in a more appropriate way. To do so we also had to highlight the link between literacy and school development and to clarify the social functioning of exclusion processes linked to problems with literacy acquisition. So the reading process was no more seen as machine-like information processing, but as a true social practice relying on and shaping students' identities. If this is true, it obviously becomes important to show that there is a link between literacy and emotions, and to understand how this relationship could function. Coles (1999) has pointed out that the unity between cognition and emotions has been disregarded both by psychologists and educationalists, though there are good neurological evidences for literary as a cognitive process being intertwined with emotions (Damasio 1994, LeDoux 1996). The available data allowed a first exploration of the role of emotions in the literacy acquisition process.

Data

All the data we have worked on come from the Dudelange School Project in the context of which we have been active since 1998. In September 1998 we undertook a quantitative survey including all Dudelange fourth graders (n=198) and we have collected social, educational, emotional and cognitive variables. The global data file includes more than

270 variables. For our present purpose we focus on the analysis of the link between literacy and the emotional situation of children in school. So we have selected two sets of variables: on the one hand those linked with students' reading performances and on the other hand those related to students' emotional situations. Moreover we have a second data set at our disposal. For in 1999 we launched the Dudelange Case Study which included all poor readers we had detected in the survey (n=80). Among other information gathering, we interviewed all of them in order to reconstruct their insights about their literacy development process.

Measurement

So our quantitative analysis concerns the link between literacy and emotions in the light of the data from the Dudelange Survey Study (DSS). Our first step was the construction of a general literacy index. The following aspects of literacy were covered in the data file: word recognition, two aspects of reading comprehension, spelling, sentence structuring and passive vocabulary. The difference between the two comprehension variables is that comprehension 1 is a broader concept distinguishing four different levels of comprehension and varying text genres. Comprehension 2 is narrower; it is based on only one text and nine question items. Table 1 describes the six literacy variables. Table 2 gives their descriptive statistics.

Our next step is concerned with the measurement of emotions. Let us start again with presenting the variables. We collected data on variables related to anxiety, stress, self-concept and motivation. We used four instruments which gave us eleven variables (see Tab. 2). The descriptive statistics can be found in Table 4.

Models

The General Literacy factor

A look at the correlation matrix in Table 5 shows that the six literacy variables are

strongly interrelated. Consequently, we concluded that the concept of literacy refers to a set of interdependent characteristics. So it seems important to construct a scale for measuring the literacy factor or factors behind the observed literacy characteristics.

Factor analysis could be an appropriate means for constructing general literacy measures. We found one principal factor behind the six variables. The corresponding Scree plot (Fig.1) shows a clear elbow point at Factor 2. So we are able to reduce the six literacy variables to only one factor: the general literacy factor. The factor matrix (Tab. 6) shows strong loads on spelling, comprehension 1, spelling and a less strong load on vocabulary and comprehension 2. In the bottom position we find word reading.

The Emotion Factors

Also the emotion variables are strongly interrelated, as shown by the correlation matrix in Table 7. Again we tried to reduce data. Factor analysis of the eleven emotion variables gives us three factors (see Scree plot in Fig. 2). The first one is interpreted as suffering from school. As can be seen from the factor matrix (Tab.8), it is characterized by very high loads on the two anxiety variables, on school reluctance and on the effort avoiding variable, medium high negative loads on self-value variables and medium high positive loads on stress variables. The second factor expresses a positive attitude towards school, whereas we considered the third factor to show a dislike of school. The second factor shows high loads on coping with stress, self value variables and zeal, low positive loads on the anxiety variables, whereas the load on school reluctance and effort avoiding do not vary much from zero. The third factor scores are highest on school reluctance, on self-value in leisure and on effort avoiding. We find the lowest values for anxiety, stress and zeal. Whereas for self value in school the load is very low, we have a negative load for self value in the family.

Comparing the means of the emotion variables for groups split up by the three factors

might illustrate the meaning and the differing importance of these. As Factor 1 explains a huge part of variance, the comparison of means for five 20%-groups with Factor 1 varying from very high to very low is obviously the most interesting table (Table 9). We find a regular increase or decrease for all variables but one, the minimum means appear in the very low group and the maximum ones in the very high group. The opposite is true for the three self-esteem variables. The difference between the means of the top and the bottom groups are high and significant for anxiety, self value variables and effort avoiding. They are lower and non significant for school reluctance, stress variables and zeal. Due to the decreasing amount of explained variance, the corresponding tables for Factor 2 and Factor 3 are less interesting (Tables 10 and 11). They can be read in a similar way, though irregularities are more frequent and differences less big. The important points for Factor 2 are the change of direction that occurred for self value variables, which backs the interpretation that Factor 2 deserves a relatively positive label, as well as a loss of importance for anxiety variables and effort avoiding, and a gain for stress variables and zeal. For factor three we can see that the obvious high points are school reluctance, self-esteem in school and effort avoiding. This gives the picture of a negative reaction, which does not harm the individual well-being as much as with Factor 1.

The Emotion Clusters

Reducing data through factor analysis might give us insights into the general functioning of school failure. But it is still difficult to produce evidence able to influence practitioners' belief systems and to be helpful for their reflection work and their everyday interacting with individual students. Thus we looked for an alternative means for reducing data. Cluster analysis allowed as to group cases according to similarity on the 11 emotion variables and has produced a kind of taxonomy distinguishing between five emotion types.

We reordered and labeled the five obtained categories and finally ended up with the following distribution (see histogram in Fig. 3): (a) Cluster 1: Helplessness (18.6%), (b) Cluster 2: Hostility (21.7%), (c) Cluster 3: Unease (21.6%), (d) Cluster 4: Realism (23.2%), (e) Cluster 5: Optimism (14.4%).

Comparing the means of both emotion factors and emotion variables for the sample broken down by clusters (Tables 12) will allow us to approach a plausible meaning behind the statistically constructed clusters. It becomes apparent that suffering from school is strongly, almost linearly related to the cluster solution (Eta Squared: .75). Suffering decreases in regular steps by clusters, with the helpless students suffering most and the optimistic ones least. The second factor again plays a less important role. It merely differentiates specific groups: the hostile ones versus those who do not feel at ease, the realists versus the optimists, with in both cases a relatively more positive attitude towards school for the latter group. There is only a weak relationship between the cluster solution and factor 3 (Eta Squared: .07). The striking feature is that a dislike of school is weakest for the helpless students and the optimistic ones. Obviously what creates the luck of one group, creates the misery of another.

Studying the link with variables gives a more detailed view. The associations between clusters and variables (Table 14) give an impression of how the different variables contribute to the clusters. In the top group (Eta Squared above .40) figure both anxiety variables, self-esteem in family and in leisure as well as effort avoiding. In the middle group (Eta Squared between .40 and .30) appear self value in school and coping with stress, and in the bottom group we finally find somatic stress symptoms, stress experience, school reluctance and zeal.

When looking at the graphs (see Fig. 4-7) comparing the means gives a good picture of the meaning of the five clusters. The group of the helpless students shows low self-esteem

means and high means for anxiety and stress variables, as well as for effort avoiding. Characteristically there is no indication for an opposition against school values, for school reluctance on the one hand is relatively low, and zeal on the other hand is relatively high. Students whose attitude has been interpreted as hostility against school apparently can rely on a few more defence mechanisms than the helpless ones. Self-esteems are still low, but anxiety and stress variables and especially zeal decrease. Regarding the relation between zeal and effort avoiding (Fig. 7), the hostile and the optimistic students are the only ones who show coherent positions: coherently negative, low on zeal and high on effort avoiding, or coherently positive, high on zeal and low on effort avoiding, whereas all the others, a large majority of students, contradict themselves, by wanting to succeed without being prepared to work. For the three remaining groups the average of self value variables are above average, with optimists scoring highest and realists lowest (Fig. 6). The values of all the other means, anxiety and stress variables, school reluctance and effort avoiding drop regularly over the three remaining categories. There are two exceptions to this general tendency: zeal and coping with stress are strikingly higher for optimists.

Results

Whereas the second and the third factors are not interrelated with the general literacy factor, the first factor (suffering from school) correlates negatively (Table 15), as can also be seen from scattergrams (Fig.8-10). Splitting the whole sample into five equal groups according to the suffering factor and comparing means (Table 14), we see that the means of the general literacy factors decrease regularly with increasing values of suffering from school. The one-way analysis of variance is significant, and gives an explained variance rate of 28.2% (R=-.530 and ETA =-.531). As we do not want to speculate about causality at this stage, we made the same analysis the other way round (Table 15). The picture is as obvious,

again with a significant one-way analysis of variance and an explained variance of 32.3%. So the hypothesis can be admitted that poor readers very often suffer from school, and that students who suffer from school risk to become poor readers.

Comparing the means of the general literacy factor for the five emotion clusters (Table 16), we again find a clear tendency. There is a regular decrease of literacy performances over the five emotion clusters. The explained variance amounts to 28.4 % and the corresponding box-plot (Fig. 12) is very similar to the comparison of means described above (see boxplot in Fig. 11). Splitting the sample into five equal groups and comparing with clusters produces a crosstab (Table 17) with a highly significant Chi-Square Test (Table 18) which confirms the discovered tendency. 50 % of students with a very low general literacy factor come from the group of the helpless ones, whereas none of the optimists belongs to that group. On the other side of the continuum, among those 39 students who have top general literacy scores, we only find two (5.1 %) helpless ones compared to 15 (38.5 %) optimists. So from whatever angle we look at our data, it becomes evident that there exists a strong relationship between general literacy and the emotional situation of children in the school context.

Discussion and Prospects

We have just started a parallel qualitative study. Its purpose is to reconstruct students' insights from the data of the Dudelange Case Study where in depth interviews have been conducted with 80 poor readers in order to compare and to link qualitative and quantitative approach. This is particularly important if we want to use our results for teacher training. We hope to obtain the opportunity to consider our quantitative models in the light of children's everyday semantics. The domains of inquiry retained for the interview study were the following: What contact do students have contact with reading material? What concept of

reading do they have? What is their reading experience? What is their reading biography? Which role does reading play in their family background, in early reading education and in school now? Which life prospects does literacy give them? The other main topic in the interviews is the emotional reaction towards school and how the link between literacy and emotions becomes apparent to children.

Conclusions

As a first conclusion we plead for a theoretical re-framing of literacy matters. Literacy is not only a problem of mere information processing. It is generally linked to cultural and social issues. Learning to read is more than acquiring a technical skill, and literacy can not be regarded as a simple instrument. For it is an important element of sociability. It depends on the social introduction of individuals into society. Providing an access to literacy thus also means negotiating the construction of an interface between social and individual emotions. To manage that task learning environments, classrooms and schools, can promote literacy by being socially integrative and by facilitating the development of optimism.

So our second conclusion concerns the role of schools. Schools where literacy thrives are schools (Berg & Lick 2001) where optimism thrives. Our results can actually be read in parallel to Seligman's work on learned helplessness and optimism. Success in learning to read makes students optimistic; but it also works the other way round. Optimism makes students successful. Children learn their own explanatory style. Parents are not the only adults who unwittingly impose their explanatory style on children. Teachers and coaches are enormously influential. (Seligman 1992) Learning to read is an important link in this development process. At least school teachers should be aware of the power of explanatory styles and schools should develop a clear policy. Our idea is that learning optimism is to be

linked to early reading education. For if schools function as optimistic organizations, less students will go off the track, and more students will develop enough perseverance and frustration tolerance to be able to cope with the difficult task of learning to read in a multilingual context. Obviously that cannot replace accurate knowledge on the reading process, nor does it make early intervention programs superfluous. Nevertheless developing optimism is a necessary background for all reading instruction.

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Appendix 1: Tables

Table 1

List of Collected Literacy Variables

Name	*Label*	*Description*
L1	Hamlet 3-4, Word Test 040, Rawscore	Assign 40 words to a multiple choice of four pictures
L2	Hamlet 3-4, Comprehension, Total Rawscore	Answer 4 multiple choice questions for each of 10 texts (four levels of comprehension)
L3	WRT4, Spelling, Rawscore	Insert 33 "critical" words after dictation
L4	DTD-PW, Passive Vocabulary, Rawscore	Find one misspelled letter in each of 22 words
L5	DTD-TS, Structuring, Rawscore	Find word limits in 22 sentences printed without blanks
L6	DTD-LV, Comprehension, Rawscore	Answer 9 multiple choice questions on a text
	Instruments:	
L1, L2	R.H. Lehmann et al. (1997). Hamburger Lesetest für 3. und 4. Klassen. Wenheim and Basel: Beltz Verlag (HAMLET 3-4)	
L3	P. Rathenow (^{2}1980) Westermann Rechtschreibtest 4/5. Braunschweig: Georg Westermann Verlag (WRT 4/5)	
L4, L5, L6	J. Nauck & R. Otte (1980). Diagnostischer Test Deutsch. Braunschweig: Georg Westermann Verlag (DTD)	

Table 2

Univariate Statistics of Literacy Variables

	N		Mean	Median	Mode	Std. Deviation	Variance	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
	Valid	Missing									
Hamlet 3-4, Word Test 040, Rawscore	198	0	1.99	3.98	3.98	2.43	5.90	-.44	.17	-1.72	.34
Hamlet 3-4, Comprehension, Total Rawscore	198	0	20.31	20.00	19.00	7.67	58.81	-.14	.17	-.59	.34
WRT4, Spelling, Rawscore)	197	1	34.24	37.00	47.00	13.43	180.46	-.73	.17	-.14	.34
DTD-PW, Passive Vocabulary, Rawscore	197	1	6.18	3.98	3.00 [a]	3.39	11.48	.49	.17	-.05	.34
DTD-TS, Structuring, Rawscore	197	1	6.74	20.00	4.00	4.82	23.28	.57	.17	-.48	.34
DTD-LV, Comprehension, Rawscore	197	1	6.73	37.00	5.00	3.44	11.85	.28	.17	-.55	.34

a. Multiple modes exist. The smallest value is shown

Table 3

List of Collected Emotion Variables

Name	*Label*	*Description*
M01	AFS-PA, Class Paper Anxiety, Rawscore	25 items scale from multifactorial questionnaire
M02	AFS-MA, General Anxiety, Rawscore	26 item scale from a multifactorial scale
M03	AFS-SU, School Reluctance, Rawscore	22 item scale from a multidactorial questionnaire
M04	ALS-FA, Self-Value in Family, Rawscore	18 statements to be rated
M05	ALS-FREI, Self-Value in Leisure, Rawscore	18 statements to be rated
M06	ALS-SCHU, Self-Value in School, Rawscore	18 statements to be rated
M07	SSK1, Stress Experience, Rawscore	8 item subquestionnaire
M08	SSK2, Coping with Stress, Rawscore	24 item subquestionnaire (three dimensions of coping)
M09	SSK3, Somatic Stress Symptoms, Rawscore	8 item questionnaire
M10	AVT-AV, Effort Avoiding, Rawscore	scale of 20 items to be confirmed or negated
M11	AVT-P, Zeal, Rawscore	scale of 10 items to be confirmed or negated
	Instruments:	
M01 M02 M03	W. Wieczerkowski, H. Nickel, A. Janowski, B. Fittkau und W. Rauer (^{4}1979). Angstfragebogen für Schüler. Braunschweig: Georg Westermann Verlag	
M04 M05 M06	T. Schauder (^{2}1996). Die Aussagenliste zum Selbstwertgefühl für Kinder und Jugendliche. Göttingen: Beltz Test	
M07 M08 M09	A. Lohaus, B. Fleer, P. Freytag & J. Klein-Heßling (1996). Fragebogen zur Erhebung von Streßerleben und Streßbewältigung im Kindesalter. Göttingen, bern, Toronto, Seattle: Hogrefe	
M10 M11	B. Rollett & M. Bartram (^{3}1998). Anstrengungsvermeidungstest. Göttingen, Bern, Toronto, Seattle: Hogrefe	

Table 4

Univariate Statistics of Emotion Variables

	N		Mean	Median	Mode	Std. Deviation	Variance	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
	Valid	Missing									
AFS-PA, Class Paper Anxiety, Rawscore	197	1	7.39	7.00	10.00	4.17	17.41	-.04	.17	-1.09	.34
AFS-MA, General Anxiety, Rawscore	197	1	7.12	7.00	6.00	3.82	14.59	.07	.17	-.78	.34
AFS-SU, School Reluctance, Rawscore	197	1	3.80	3.00	2.00	2.40	5.76	.52	.17	-.48	.34
ALS-FA, Self Value in Family, Rawscore	196	2	17.37	19.50	22.00	10.85	117.66	-.64	.17	.09	.35
ALS-FREI, Self Value in Leisure, Rawscore	197	1	13.59	14.00	18.00	10.15	103.12	-.25	.17	-.23	.34
ALS-SCHU, Self Value in School, Rawscore	197	1	9.47	9.00	17.00	11.11	123.46	-.12	.17	-.49	.34
SSK1, Stress Experience, Rawscore	197	1	21.23	21.00	20.00	5.20	27.08	-.09	.17	-.54	.34
SSK2, Coping with Stress, Rawscore	197	1	122.28	123.00	128.00	31.05	964.20	-.17	.17	.22	.34
SSK3, Somatic Stress Symptoms, Rawscore	195	3	12.42	12.00	12.00	3.85	14.80	-.08	.17	.94	.35
AVT-AV, Effort Avoiding, Rawscore	197	1	7.96	8.00	12.00	4.64	21.51	.14	.17	-.82	.34
AVT-P, Zeal, Rawscore	197	1	7.14	7.00	7.00	1.85	3.42	-.48	.17	-.15	.34

Table 5

Correlation Matrix of Standardized Literacy Variables

		Word Reading	Comprehension 1	Spelling	Vocabulary	Structuring	Comprehension 2
Correlation	Word Reading	1.00	.36	.38	.37	.34	.35
	Comprehension 1	.36	1.00	.72	.61	.73	.67
	Spelling	.38	.72	1.00	.75	.73	.56
	Vocabulary	.37	.61	.75	1.00	.63	.51
	Structuring	.34	.73	.73	.63	1.00	.58
	Comprehension 2	.35	.67	.56	.51	.58	1.00

Table 6

Factor Matrix from Factor Analysis of Standardized Literacy Variables

Factor Matrix[a]

	Factor 1
ZL3 Spelling	.87
ZL2 Comprehension 1	.85
ZL5 Structuring	.83
ZL4 Vocabulary	.77
ZL6 Comprehension 2	.70
ZL1 Word Reading	.45

Extraction Method: Principal Axis Factoring.

a. 1 factors extracted. 5 iterations required.

Table 7

Correlation Matrix of Standardized Emotion Variables

		Classpaper Anxiety	General Anxiety	School Reluctance	Self Value in Family	Self Value in Leisure	Self Value in School	Stress Experience	Coping With Stress	Somatic Stress Symptoms	Effort Avoiding	Zeal
Correlation	Classpaper Anxiety	1.00	.72	.41	-.32	-.34	-.48	.40	.29	.35	.52	.19
	General Anxiety	.72	1.00	.32	-.34	-.40	-.41	.38	.32	.36	.53	.25
	School Reluctance	.41	.32	1.00	-.23	-.20	-.37	.22	.11	.15	.55	-.03
	Self Value in Family	-.32	-.34	-.23	1.00	.74	.56	-.16	.01	-.19	-.41	.11
	Self Value in Leisure	-.34	-.40	-.20	.74	1.00	.62	-.11	-.05	-.16	-.32	.04
	Self Value in School	-.48	-.41	-.37	.56	.62	1.00	-.13	-.07	-.16	-.44	.08
	Stress Experience	.40	.38	.22	-.16	-.11	-.13	1.00	.33	.25	.32	.17
	Coping With Stress	.29	.32	.11	.01	-.05	-.07	.33	1.00	.41	.20	.22
	Somatic Stress Symptoms	.35	.36	.15	-.19	-.16	-.16	.25	.41	1.00	.33	.16
	Effort Avoiding	.52	.53	.55	-.41	-.32	-.44	.32	.20	.33	1.00	.07
	Zeal	.19	.25	-.03	.11	.04	.08	.17	.22	.16	.07	1.00

Table 8

Factor Matrix from Factor Analysis of Standardized Emotion Variables

Factor Matrix[a]

	Factor		
	1	2	3
General Anxiety	.75	.26	-.10
Classpaper Anxiety	.75	.24	.03
Effort Avoiding	.71	.09	.29
Self Value in Leisure	-.67	.55	.30
Self Value in School	-.67	.34	-.07
Self Value in Family	-.63	.49	.13
School Reluctance	.53	.04	.51
Somatic Stress Symptoms	.43	.29	-.17
Stress Experience	.42	.32	-.05
Coping With Stress	.32	.45	-.21
Zeal	.13	.37	-.19

Extraction Method: Principal Axis Factoring.

a. 3 factors extracted. 16 iterations required.

Table 9

Means of Emotion Variables by Recoded Emotion Factor 1

Classpaper Anxiety, General Anxiety, School Reluctance, Self Value in Family, Self Value in Leisure, Self Value in School, S Experience, Coping With Stress, Somatic Stress Symptoms, Effort Avoiding, Zeal * Suffering from School (recoded)

Suffering from School (recoded)		Classpaper Anxiety	General Anxiety	School Reluctance	Self Value in Family	Self Value in Leisure	Self Value in School	Stress Experience	Coping With Stress	Somatic Stress Symptoms	Effort Avoiding	Zeal
Very low	Mean	-1.19	-1.11	-.83	.82	.92	1.01	-.65	-.40	-.73	-1.07	-.13
	N	39	39	39	39	39	39	39	39	39	39	39
	Std. Deviation	.50	.61	.63	.53	.63	.69	.96	.83	.70	.59	1.00
low	Mean	-.48	-.44	-.32	.45	.39	.33	-.21	-.29	-.14	-.42	.00
	N	39	39	39	39	39	39	39	39	39	39	39
	Std. Deviation	.61	.77	.67	.73	.60	.80	.97	.86	.71	.88	.88
Average	Mean	.13	.02	.04	.02	.10	.17	.28	.01	.13	.06	-.06
	N	39	39	39	39	39	39	39	39	39	39	39
	Std. Deviation	.72	.63	.89	.85	.86	.74	.92	.89	1.13	.64	.96
High	Mean	.53	.41	.34	-.30	-.44	-.61	.06	.31	.13	.31	.09
	N	39	39	39	39	39	39	39	39	39	39	39
	Std. Deviation	.72	.66	1.00	.86	.80	.73	.77	.96	.92	.68	1.06
Very high	Mean	.99	1.15	.72	-.99	-1.01	-.92	.58	.46	.63	1.12	.20
	N	38	38	38	38	38	38	38	38	38	38	38
	Std. Deviation	.69	.63	1.00	.94	.85	.72	.97	1.09	1.01	.64	1.03
Total	Mean	-.01	.00	-.01	.00	.00	.00	.01	.02	.00	-.01	.02
	N	194	194	194	194	194	194	194	194	194	194	194
	Std. Deviation	1.00	1.01	1.00	1.00	1.00	1.01	1.00	.98	1.00	1.00	.98

Table 10

Means of Emotion Variables by Recoded Emotion Factor 2

asspaper Anxiety, General Anxiety, School Reluctance, Self Value in Family, Self Value in Leisure, Self Value in School, Stress E› erience, Coping With Stress, Somatic Stress Symptoms, Effort Avoiding, Zeal * Positive Attitude towards School (recoded)

Positive Attitude towards School (recoded)		Classpaper Anxiety	General Anxiety	School Reluctance	Self Value in Family	Self Value in Leisure	Self Value in School	Stress Experience	Coping With Stress	Somatic Stress Symptoms	Effort Avoiding	Zeal
Very low	Mean	-.21	-.19	-.04	-1.01	-1.05	-.70	-.33	-.44	-.21	.02	-.67
	N	38	38	38	38	38	38	38	38	38	38	38
	Std. Deviation	.82	1.03	.86	1.04	.80	.69	.89	.89	1.19	1.00	.96
low	Mean	-.35	-.45	-.13	-.01	-.11	-.09	-.37	-.40	-.31	-.36	-.14
	N	39	39	39	39	39	39	39	39	39	39	39
	Std. Deviation	1.06	1.00	.94	.77	.76	1.01	.94	.80	.82	.91	.90
Average	Mean	-.03	-.02	.13	-.07	-.05	-.01	.03	-.10	-.25	.09	.15
	N	39	39	39	39	39	39	39	39	39	39	39
	Std. Deviation	.99	.95	1.01	.86	.92	.94	.95	1.09	.69	.95	.93
High	Mean	-.12	.04	-.15	.46	.37	.49	-.04	.17	.30	.06	.19
	N	39	39	39	39	39	39	39	39	39	39	39
	Std. Deviation	1.04	.95	1.06	.78	.76	.95	1.07	.67	1.04	1.14	.83
Very high	Mean	.66	.61	.12	.62	.80	.30	.74	.84	.48	.16	.55
	N	39	39	39	39	39	39	39	39	39	39	39
	Std. Deviation	.79	.83	1.11	.71	.75	1.01	.78	.84	.98	.97	.91
Total	Mean	-.01	.00	-.01	.00	.00	.00	.01	.02	.00	-.01	.02
	N	194	194	194	194	194	194	194	194	194	194	194
	Std. Deviation	1.00	1.01	1.00	1.00	1.00	1.01	1.00	.98	1.00	1.00	.98

Table 11

Means of Emotion Variables by Recoded Emotion Factor 3

Classpaper Anxiety, General Anxiety, School Reluctance, Self Value in Family, Self Value In Leisure, Self Value in School, Experience, Coping With Stress, Somatic Stress Symptoms, Effort Avoiding, Zeal * Disliking School (recoded)

Disliking School (recoded)		Classpaper Anxiety	General Anxiety	School Reluctance	Self Value in Family	Self Value in Leisure	Self Value in School	Stress Experience	Coping With Stress	Somatic Stress Symptoms	Effort Avoiding	Zeal
Very low	Mean	.12	.31	-.77	-.32	-.60	-.04	.17	.55	.53	-.31	.27
	N	39	39	39	39	39	39	39	39	39	39	39
	Std. Deviation	.99	.94	.59	1.06	.98	1.01	.94	.90	.85	.94	.81
low	Mean	-.13	-.02	-.43	.09	-.12	.29	.00	.06	.17	-.35	.31
	N	39	39	39	39	39	39	39	39	39	39	39
	Std. Deviation	.92	.92	.65	.92	.83	.90	.91	.74	.94	1.02	.89
Average	Mean	-.11	-.08	-.20	-.13	.13	-.08	.08	-.06	-.20	-.27	.05
	N	38	38	38	38	38	38	38	38	38	38	38
	Std. Deviation	1.07	1.22	.91	1.17	1.03	1.16	.93	.96	.97	1.05	.96
High	Mean	-.08	-.13	.23	.22	.10	-.02	-.07	-.15	-.31	.25	-.30
	N	40	40	40	40	40	40	40	40	40	40	40
	Std. Deviation	1.05	.98	.81	.93	1.04	1.00	1.13	1.06	1.14	.79	1.06
Very high	Mean	.16	-.09	1.11	.15	.48	-.15	-.13	-.33	-.20	.65	-.24
	N	38	38	38	38	38	38	38	38	38	38	38
	Std. Deviation	1.00	.92	.83	.86	.82	.94	1.11	1.02	.89	.84	1.05
Total	Mean	-.01	.00	-.01	.00	.00	.00	.01	.02	.00	-.01	.02
	N	194	194	194	194	194	194	194	194	194	194	194
	Std. Deviation	1.00	1.01	1.00	1.00	1.00	1.01	1.00	.98	1.00	1.00	.98

Table 12

Means of Emotion Factors by Clusters

Emotion Clusters (recoded)		Suffering from School	Positive Attitude Towards School	Disliking School
Helplessness	Mean	1.12	.05	-.33
	N	36	36	36
	Std. Deviation	.46	.63	.78
Hostility	Mean	.56	-.76	.18
	N	43	43	43
	Std. Deviation	.54	.72	.57
Unease	Mean	.04	1.11	.10
	N	42	42	42
	Std. Deviation	.56	.52	.86
Realism	Mean	-.58	-.35	.14
	N	45	45	45
	Std. Deviation	.36	.53	.86
Optimism	Mean	-1.43	.00	-.24
	N	28	28	28
	Std. Deviation	.47	.52	.50
Total	Mean	.00	.00	.00
	N	194	194	194
	Std. Deviation	.95	.88	.76

Table 13

Association Measures for Emotion Factors with Emotion Clusters

	R	R Squared	Eta	Eta Squared
Suffering from School * Emotion Clusters (recoded)	-.86	.74	.86	.75
Positive Attitude Towards School * Emotion Clusters (recoded)	.06	.00	.75	.56
Disliking School * Emotion Clusters (recoded)	.04	.00	.27	.07

Table 14

Association Measures for Emotion Variables with Emotion Clusters

	R	R Squared	Eta	Eta Squared
Classpaper Anxiety * Emotion Clusters (recoded)	-.68	.46	.74	.55
General Anxiety * Emotion Clusters (recoded)	-.70	.48	.74	.55
School Reluctance * Emotion Clusters (recoded)	-.48	.23	.51	.26
Self Value in Family * Emotion Clusters (recoded)	.60	.36	.70	.49
Self Value in Leisure * Emotion Clusters (recoded)	.63	.39	.76	.57
Self Value in School * Emotion Clusters (recoded)	.57	.33	.61	.38
Stress Experience * Emotion Clusters (recoded)	-.35	.12	.46	.21
Coping With Stress * Emotion Clusters (recoded)	-.31	.09	.57	.33
Somatic Stress Symptoms * Emotion Clusters (recoded)	-.34	.12	.53	.28
Effort Avoiding * Emotion Clusters (recoded)	-.61	.37	.64	.41
Zeal * Emotion Clusters (recoded)	-.10	.01	.39	.15
Disliking School * Emotion Clusters (recoded)	.04	.00	.27	.07

Table 15

Correlations for Emotion Factors with General Literacy Factor

		General Literacy Factor
Suffering from School	Pearson Correlation	-.55**
	Sig. (2-tailed)	.00
Positive Attitude Towards School	Pearson Correlation	.07
	Sig. (2-tailed)	.32
Disliking School	Pearson Correlation	-.01
	Sig. (2-tailed)	.93
General Literacy Factor	Pearson Correlation	1.00
	Sig. (2-tailed)	

**. Correlation is significant at the 0.01 level (2-tailed).

Table 16

Means of General Literacy Factor for five Equal Groups by Suffering from School (recoded)

GLF General Literacy Factor

Suffering from School (recode	Mean	N	Std. Deviation
Very low	.68	39	.73
low	.40	39	.83
Average	.01	39	.78
High	-.31	39	.98
Very high	-.76	38	.74
Total	.01	194	.96

Table 17

Means of Suffering from School for five Equal Groups by Genral Litercy Factor (recoded)

FAC1 Suffering from School

General Literacy Fact	Mean	N	Std. Deviation
Very low	.81	38	.75
low	.36	39	.74
Average	-.05	39	.78
High	-.37	39	.78
Very high	-.74	39	.90
Total	.00	194	.95

Table 18

Means of General Literacy Factor by Emotion Clusters (recoded)

GLF General Literacy Factor

Emotion Clusters (recode	Mean	N	Std. Deviation
Helplessness	-.74	36	.83
Hostility	-.38	43	.80
Unease	.21	42	.98
Realism	.28	45	.77
Optimism	.82	28	.83
Total	.01	194	.96

Table 19

Crosstab of General Literacy Factor Means Recoded into 5 Equal Groups by Emotion Clusters

General Literacy Factor (recoded) * Emotion Clusters (recoded) Crosstabulation

			Emotion Clusters (recoded)					
			Helplessness	Hostility	Unease	Realism	Optimism	Total
General Literacy Factor (recoded)	Very low	Count	19	10	5	4		38
		% within row	50.0%	26.3%	13.2%	10.5%		100.0%
		% within column	52.8%	23.3%	11.9%	8.9%		19.6%
	low	Count	8	15	9	6	1	39
		% within row	20.5%	38.5%	23.1%	15.4%	2.6%	100.0%
		% within column	22.2%	34.9%	21.4%	13.3%	3.6%	20.1%
	Average	Count	5	10	9	10	5	39
		% within row	12.8%	25.6%	23.1%	25.6%	12.8%	100.0%
		% within column	13.9%	23.3%	21.4%	22.2%	17.9%	20.1%
	High	Count	2	5	8	17	7	39
		% within row	5.1%	12.8%	20.5%	43.6%	17.9%	100.0%
		% within column	5.6%	11.6%	19.0%	37.8%	25.0%	20.1%
	Very high	Count	2	3	11	8	15	39
		% within row	5.1%	7.7%	28.2%	20.5%	38.5%	100.0%
		% within column	5.6%	7.0%	26.2%	17.8%	53.6%	20.1%
Total		Count	36	43	42	45	28	194
		% within row	18.6%	22.2%	21.6%	23.2%	14.4%	100.0%
		% within column	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 20

Chi-Square Test for of General Literacy Factor (Recoded into 5 Equal Groups) by Emotion Clusters

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	77.30[a]	16	.00
Likelihood Ratio	76.67	16	.00
Linear-by-Linear Association	55.52	1	.00
N of Valid Cases	194		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.48.

Appendix 2: Charts

FIG. 1

Scree Plot from Factor Analysis of Standardized Literacy Variables

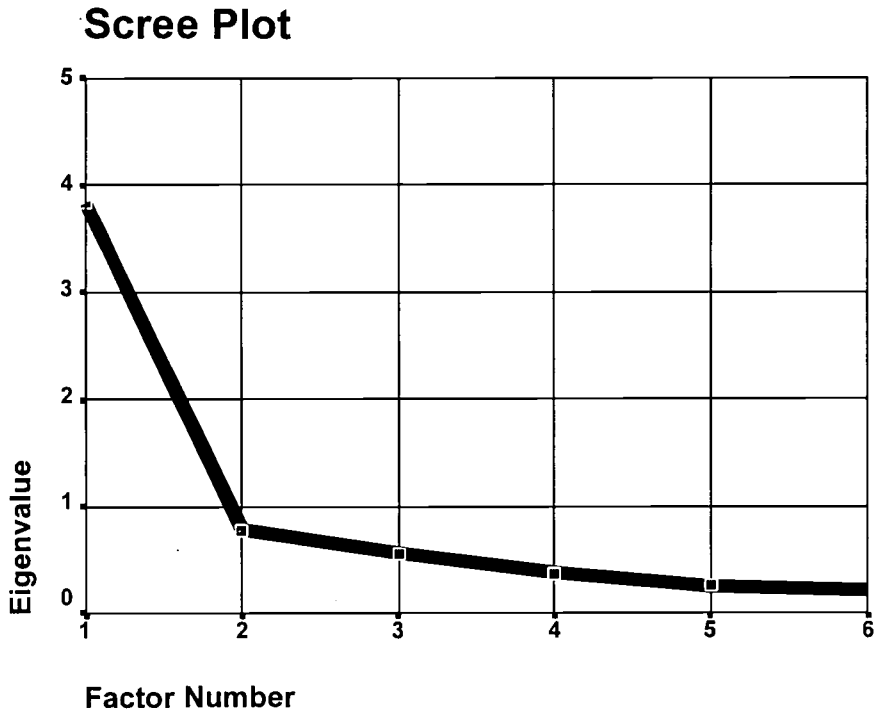


FIG. 2

Scree Plot from Factor Analysis of Emotion Variables

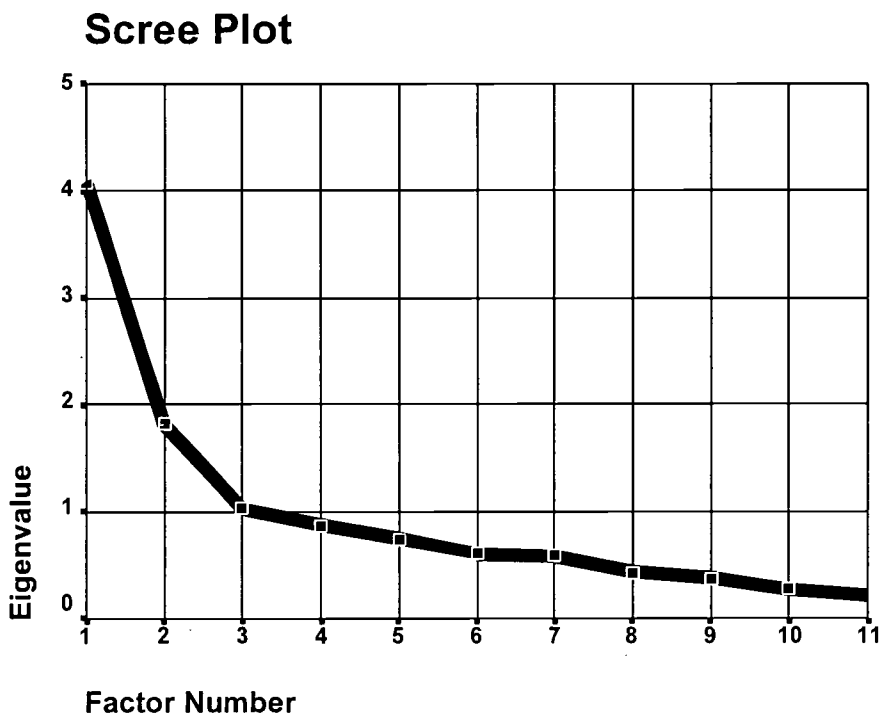


FIG. 3

Histogram of Emotion Clusters

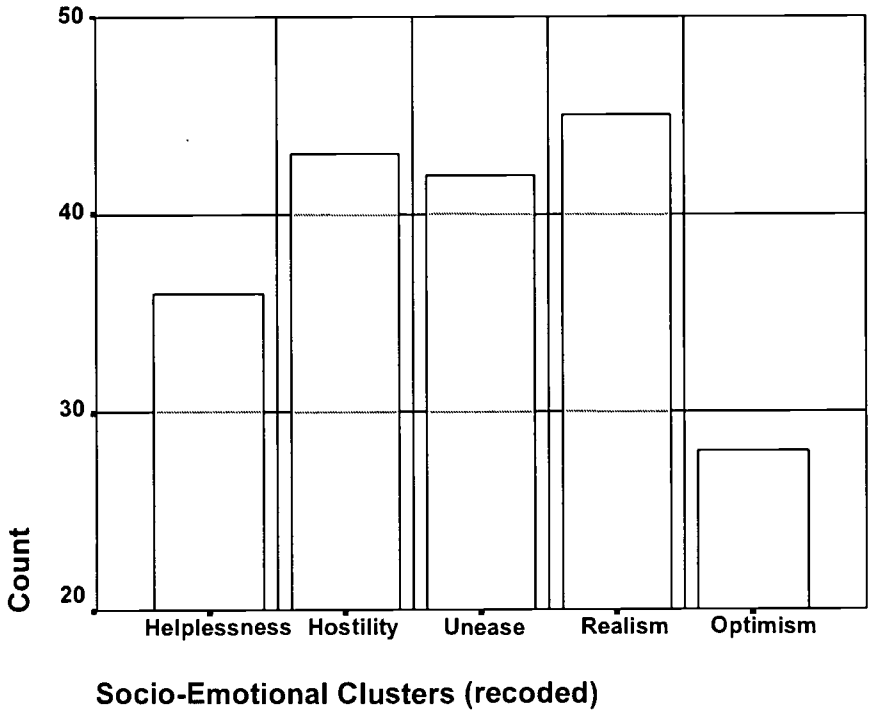


Fig. 4

Means of Standardized AFS Variables by Clusters

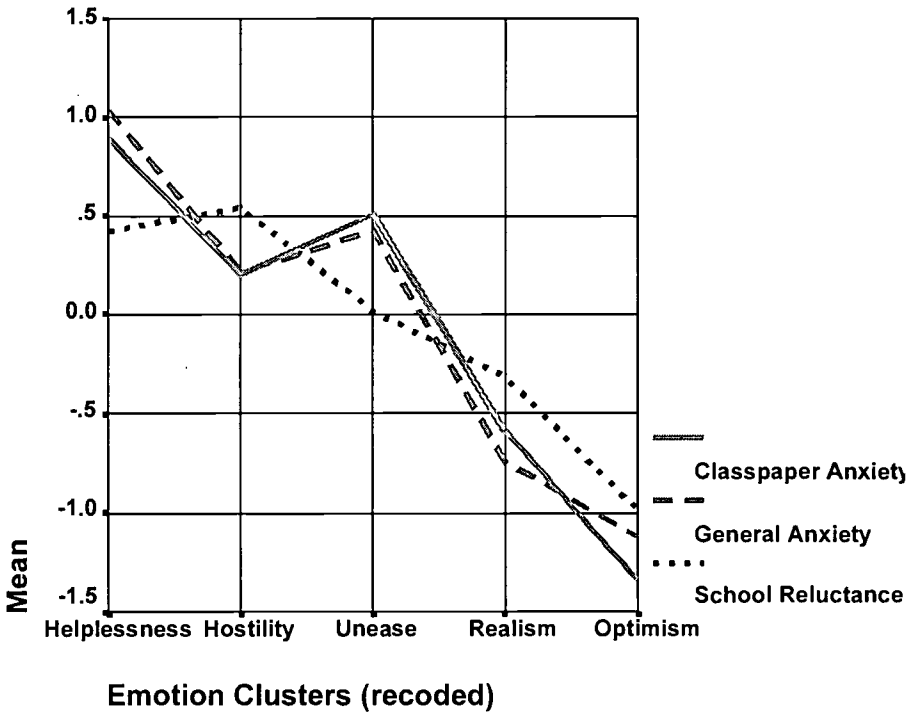


Fig. 5

Means of Standardized ALS Variables by Clusters

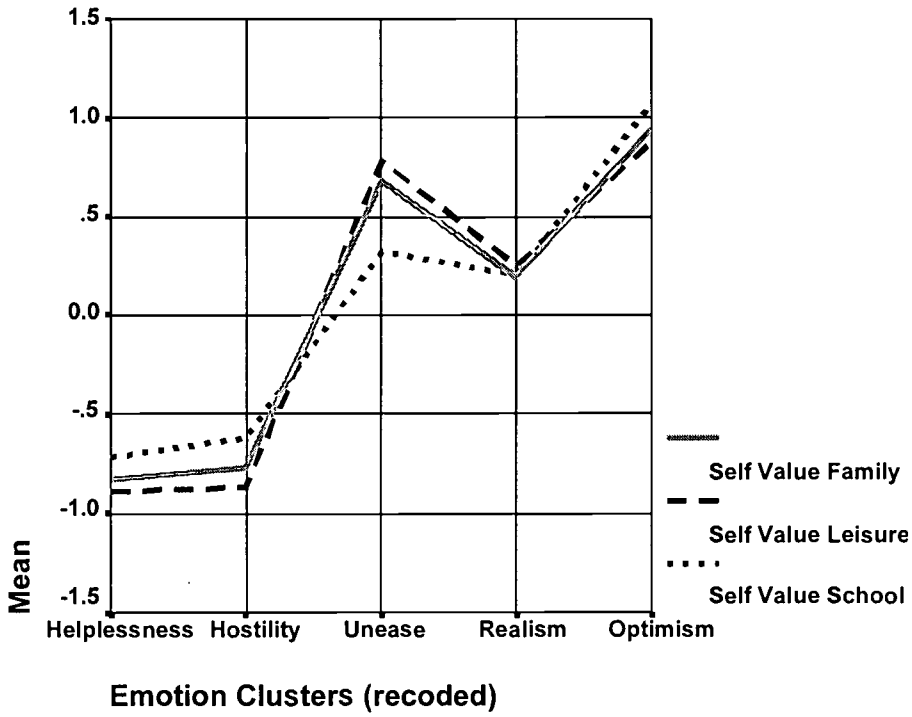


Fig. 6

Means of SSK Variables by Clusters

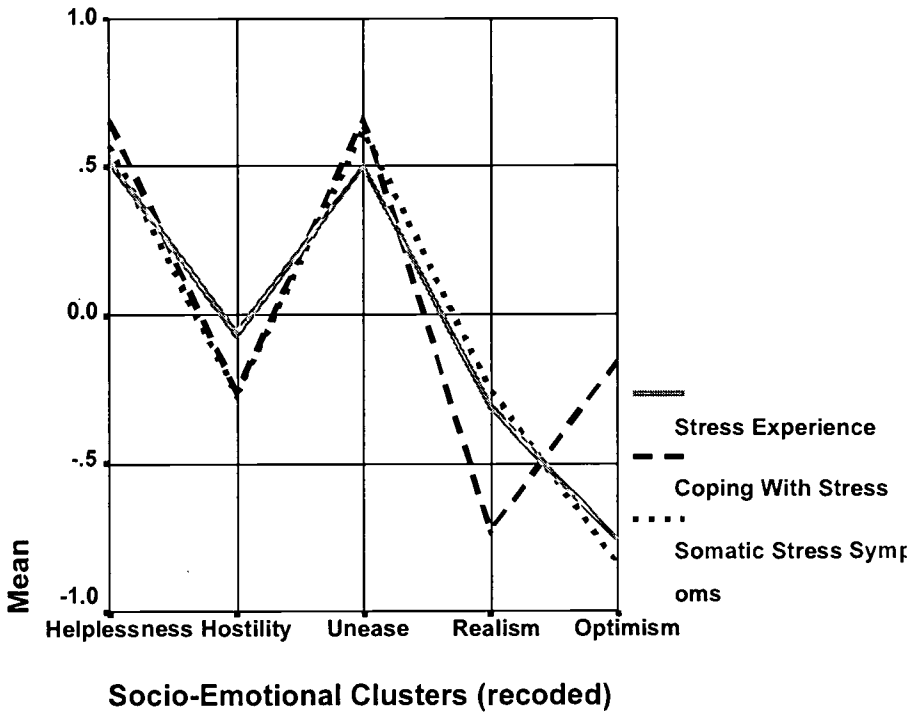


Fig. 7

Means of AV Variables by Clusters

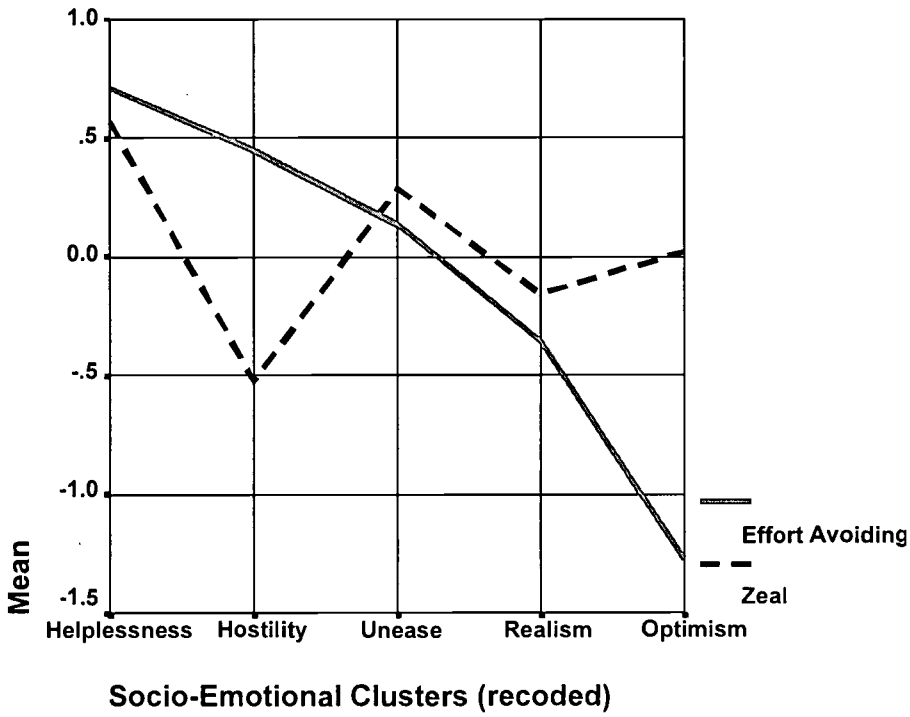


Fig. 8

Scattergram General Literacy Factor by Suffering from School

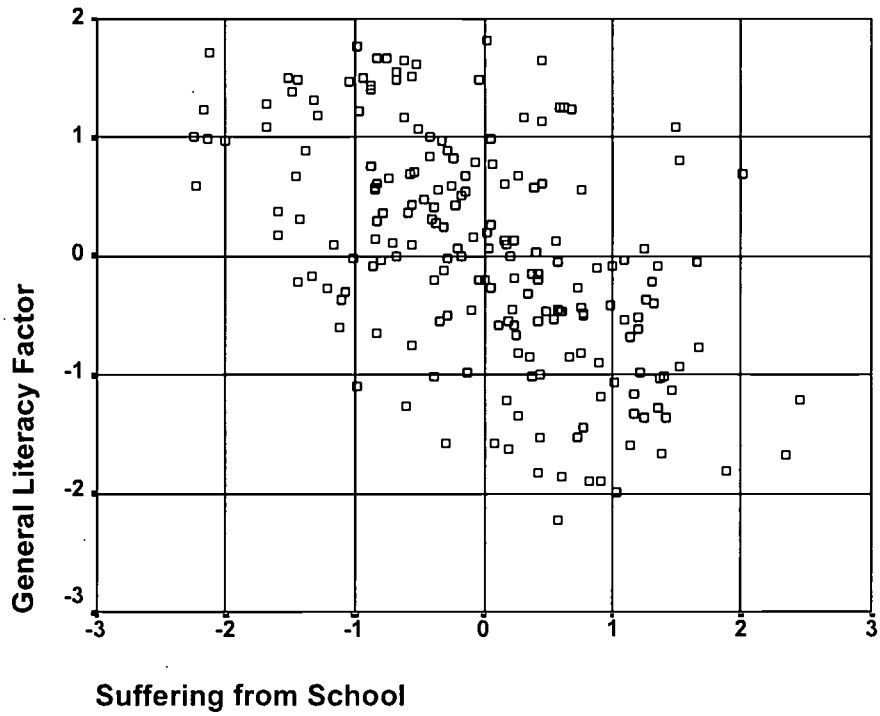


Fig. 9

Scattergram General Literacy Factor by Positive Attitude Towards School

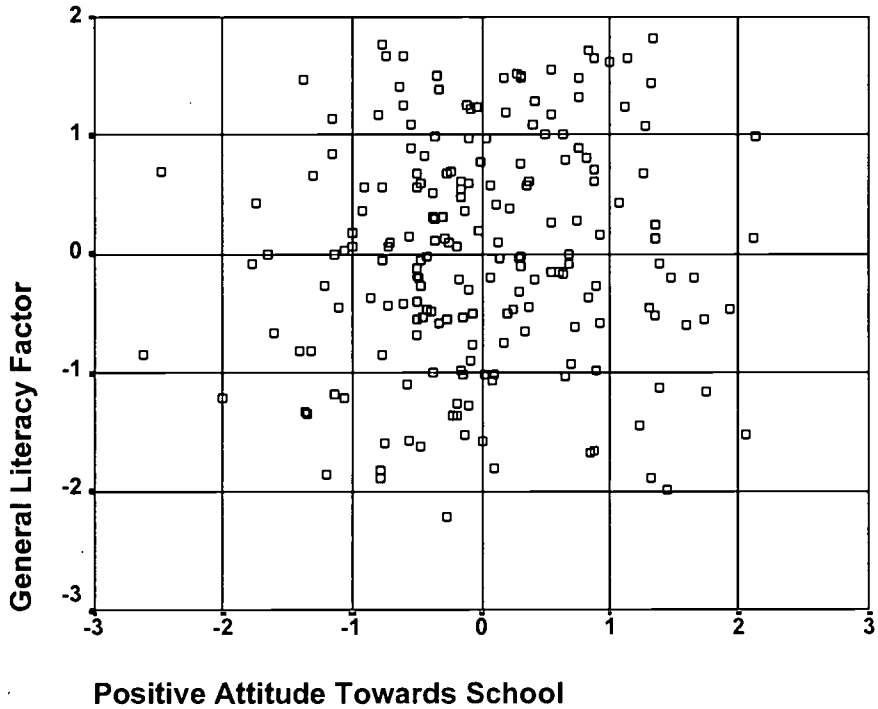


Fig. 10

Scattergram General Literacy Factor by Disliking School

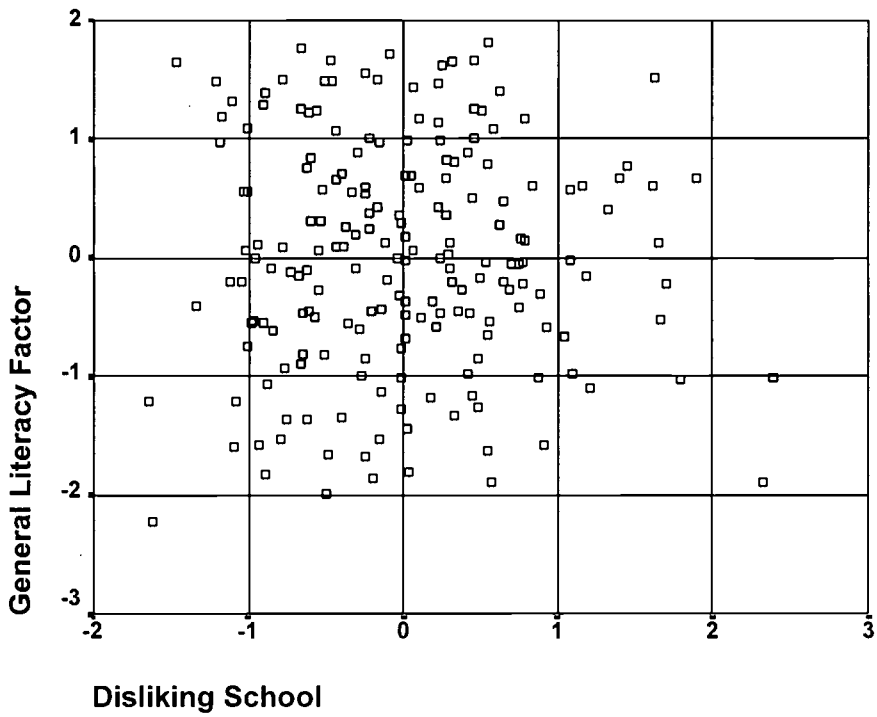


Fig. 11

Boxplot of General Literacy Factor by Suffering from School (Recoded into 5 Equal Gropups)

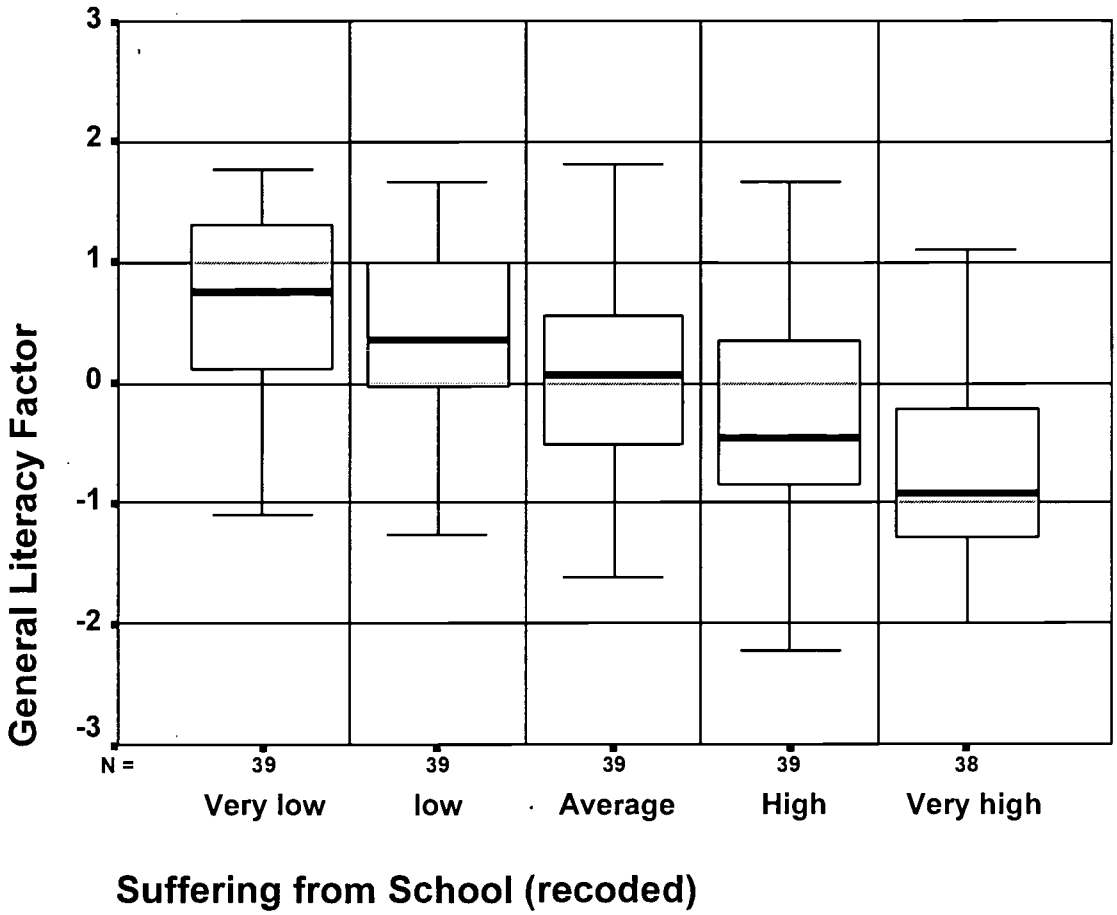
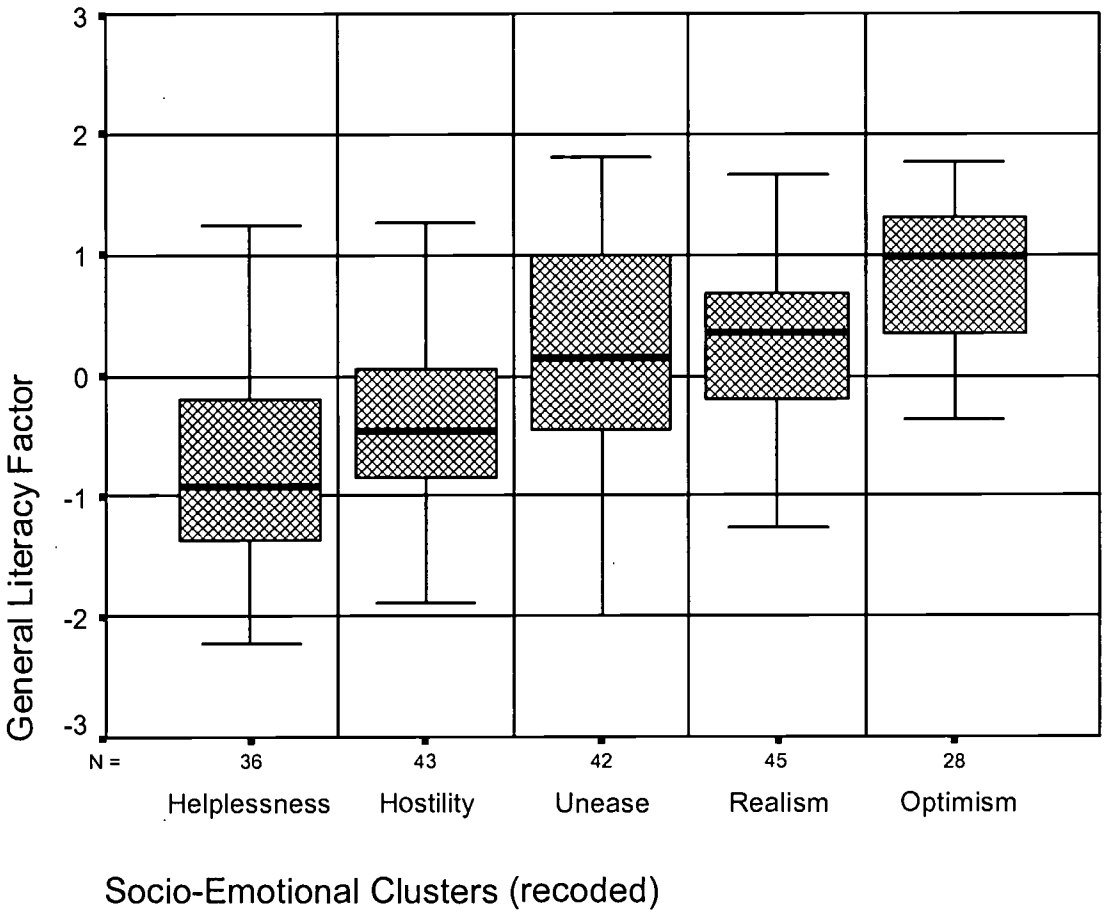


Fig. 12

Boxplot of General Literacy Factor by Emotion Clusters



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