Psychology of emotion

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Beck hopelessness scale: dimensional structure and its determinants

This study examines the dimensional structure of the Beck Hopelessness Scale and its determinants. 596 primary school pupils aged 12-15 years and 474 pedagogical university students aged 19-22 years filled in the Polish version of the Beck Hopelessness Scale with 4 points "agree-disagree" response options. Two factor-analytic models were tested. One-factor structure (hope-hopelessness as one bipolar dimension) has best parameters in sample of pedagogical university students while two-factor structure (hope and hopelessness as two relatively independent dimensions) has best parameters in sample of primary school pupils. The findings are analyzed in light of the hypothesis about dependence of the dimensional structure of the affect on the cognitive development level and on the total affect variation. The data obtained in this study correspond the second of these hypotheses.

Key words: hope, hopelessness, dimensional structure.

The Beck Hopelessness Scale (BHS) is a 20-item instrument conceived as a measure of the extent of negative attitudes about the future [1; 2]. Eleven items reflect hopelessness\ pessimism (e.g., "My future seems dark to me") and nine items reflect hope\optimism (e.g., "I can look forward to more good times than bad times") (see appendix). Hope items are reverse scored. BHS was developed and is still used mostly as a one-dimensional measuring instrument. Meanwhile some authors obtained data which count in favour of two-dimensionality of techniques structurally similar to BHS. I mean one-dimensional scales containing both items related to the title emotion and items related to the inverse (opposite) emotion which rating is inverted during the final result determination. E.g., a well-known Rosenberg Self-Esteem Scale had been developed and was used as a one-dimensional one [18]. Yet a factor analysis carried out later by other authors (e.g., [21]) revealed two unipolar dimensions: negative self-image (e.g., "I feel I do not have much to be proud of") and positive self-image (e.g., "I take a positive attitude toward myself"). Life Orientation Test [19] – a technique similar to BHS in both structure and substance – has comparable history. During a later research [14] in the structure of this optimism test with one-dimensional conception two orthogonal factors – optimism (e.g., "In uncertain times, I usually expect the best") and pessimism (e.g., "Things never work out the way I want them to") – were also

discovered. The same attempts were made with regard to BHS. In the above research by Marshall et al. [14] two-factor structure the following kind was discovered. The first factor included loadings of eight (out of eleven) hope items, the second factor included loadings of seven (out of nine) hope items; and the loadings of the rest five items were either included into both the factors or revealed affiliation with neither of them. To put it otherwise, the above-mentioned work resulted in developing a new structure intermediate between one- and two-dimensional ones.

There are conceptions which allow assuming that BHS as well as any other technique of this kind (statements corresponding to positive and negative emotions) may prove to be either a one-dimensional technique or a two-dimensional one depending on the population under study. W. McDougall in his time [16] worded the conception according to which a person alongside with his/her cognitive functions' development acquires ability to simultaneously experience both positive and negative emotions, which on earlier stages of development stand as alternatives. For instance, the emotions of fear and interest are alternative experiences for children and animals; while at higher levels of cognitive development these emotions may be experienced simultaneously. Similar ideas are proposed by other authors (e.g. [6; 12; 15]). So, this conception supposes that in a sample with lower level of cognitive development there should be a stronger inverse correlation between indexes of positive and negative emotions than in the sample with higher mean level of cognitive development. Thus, in the first of these two samples one-dimensionality of affect will be more likely revealed while two-dimensionality of affect is less probable. In the second sample the situation is to be inverse.

But data were gathered from primary school pupils and pedagogical university students (more detailed description of sample look below) contradict such assumption [7; 8]. Choosing here for the analysis the data I proceeded from the fact that students have higher level of cognitive functions development as compared to primary school pupils. The factor analysis of data got in pupil sample (Table 1) revealed the following situation. Two-factor solution has good statistical parameters which are indicated by mean factor loadings and percent of explained variance. In the first factor, hopelessness items have relatively high loadings (M = 0.54) and hope items have considerably lower loadings (M = -0.12). In the second factor hope items have relatively high loadings (M = 0.52) and hopelessness items have lower loadings (M = -0.12). One-factor solution is quite applicable in this population too: both hope items (positive values) as well as hopelessness items (negative values) have high factor loadings. However, this model is characterized by lower percent of explained variance: 32% for two-factor solution vs 23% for one-factor solution. Besides mean factor loadings of hope items while switching from two-factor model (M = 0.52) to one-factor model (M = 0.41) significantly decreases ($p < .01$). The results of factor analysis got in student sample (Table 1) revealed another pattern. In the two-factor model both high and low factor loadings are distributed almost randomly between the two factors, i.e. hopelessness items and hope items have almost equal strength of correlations with each one of

these factors. One-factor model has different parameters: both hope items (positive values) and hopelessness items (negative values) have relatively high loadings.

Table 1

Factor Loadings for Pupil Sample and Student Sample; principal components, varimax rotation (adapted from [8])

Items	Pupil sample			Student sample		
	Two-factor solution		One-factor solution	Two-factor solution		One-factor solution
Pos 1.	-0,29	**0,45**	**0,50**	**-0,54**	**0,40**	**0,67**
Pos 3.	-0,07	**0,41**	0,30	-0,05	**0,52**	0,37
Pos 5.	-0,16	**0,53**	**0,44**	**-0,62**	0,07	**0,53**
Pos 6.	-0,28	**0,55**	**0,55**	**-0,60**	0,24	**0,62**
Pos 7.	0,07	**0,53**	0,26	**-0,54**	0,08	**0,47**
Pos 10.	-0,03	**0,45**	0,29	-0,34	0,15	0,36
Pos 13.	0,04	**0,58**	0,31	-0,12	**0,46**	0,38
Pos 15.	-0,21	**0,62**	**0,53**	**-0,63**	0,35	**0,71**
Pos 19.	-0,15	**0,59**	**0,47**	**-0,42**	0,32	**0,53**
Neg 2.	**0,58**	-0,09	**-0,52**	0,19	**-0,63**	**-0,54**
Neg 4.	0,20	0,00	-0,16	**0,45**	0,25	-0,19
Neg 8.	**0,51**	-0,35	**-0,61**	**0,64**	-0,39	**-0,74**
Neg 9.	**0,49**	-0,18	**-0,50**	**0,40**	-0,34	**-0,52**
Neg 11.	**0,62**	-0,14	**-0,58**	**0,64**	-0,29	**-0,68**
Neg 12.	**0,60**	-0,05	**-0,51**	**0,52**	**-0,52**	**-0,73**
Neg 14.	**0,50**	-0,05	**-0,43**	**0,62**	-0,28	**-0,66**
Neg 16.	**0,65**	-0,10	**-0,59**	**0,41**	**-0,59**	**-0,69**
Neg 17.	**0,65**	0,02	**-0,52**	**0,40**	**-0,62**	**-0,70**
Neg 18.	**0,56**	-0,26	**-0,61**	**0,66**	-0,38	**-0,76**
Neg 20.	**0,60**	-0,17	**-0,59**	0,15	**-0,70**	**-0,56**
Variance	18%	14%	23%	24%	17%	35%
Mean neg	**0,54**	-0,12	**-0,51**	0,28	-0,28	-0,39
Mean pos	-0,12	**0,52**	**0,41**	**-0,42**	0,29	**0,51**

Note. Neg = hopelessness item (see appendix); Pos = hope item; Mean neg = mean factor loadings of hopelessness items; Mean pos = mean factor loadings of hope items; Loadings of |0.40| and greater are in boldface.

Factor analysis of the data obtained in primary school pupil sample allows interpreting the current technique as either a one-dimensional hope-hopelessness scale or a two-dimensional hope and hopelessness scale. At that two-factor solution has better statistical characteristics than one-factor solution. Factor analysis of the data obtained in student sample proved that two-dimensional approach to BHS serves no purpose in this case. One-factor model seems different: it is better arranged and al-

lows well-founded interpretation of this scale as a one-factor scale. Correlations between the indexes of major variables in student and primary school pupil samples correspond to the factor-analytical patterns: in the student sample it indicates a higher degree of contrast between hope and hopelessness ($r = -0.72$, $p < .01$) than in primary school pupil sample ($r = -.40$, $p < .01$) and this difference is significant ($p < .0001$). In other words, contrary to expectations arising from McDougall's concept [16], individuals with higher cognitive development have one-dimensional positive-negative emotional structure, whereas individuals with a lower cognitive development have two-dimensional structure.

In order to find a different view of these data I referred to well known inverted-U hypothesis as dominant theoretical view in explaining the arousal-performance relationship [23]. This hypothesis specifies that good performance in a given task is achieved when a moderate arousal level is reached, whilst too high or too low arousal would result in decreased performance. How is this hypothesis linked to the data obtained in the study? The following considerations seem relevant to the problem; they suggest that the degree of affect levels dispersion in a sample influences the dimensional structure of the affect. Students are former pupils. When school pupils, most of them were more successful in their studies in comparison with their classmates and that was the ground of their entering the Higher School. We may presume that one of major factors of their success were individual psychical features which stipulated for the moderate level of emotional arousal (neither very high nor too low). That is why a lower variation of emotional activation is expected in the student sample as compared to the school pupil sample. In case we regard total emotional activation as integration of positive (P) and negative (N) emotional activation [4; 13] then we can operationalize in the way P+N (total affect) as it was done by a number of authors (e.g., [3; 11]). In case with BHS we can regard the sum of hope score and hopelessness score as total affect index. If such operationalization with activation is permissible, then according to the abovementioned assumption lower standard deviation (SD) for this total affect index (P+N) is to be discovered in the student sample as compared to the school pupil sample. Let's check up this of a hypothesis, using the primary empirical material received in above described research.

METHOD

Participants

Data were gathered from 596 primary school pupils (6, 7 and 8th forms) aged 12-15 years and 474 pedagogical university students (1st year students) aged 19-22 years.

Questionnaire

Polish version of the Beck Hopelessness Scale [5] was used. Responses to BHS were given on a 4-point scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). We computed hope score (mean for the values of the 9 items reflecting hope) and hopelessness score (mean for the values of the 11 items reflecting hopelessness). The Cronbach alpha reliability coefficients for the hope subscale and the hopeless-

ness subscale were .70 and .80, respectively in primary school sample and .76 and .88, respectively in pedagogical university sample. Following Bradburn [3] (1969; see also [10; 11]), we computed two additional indexes: positive-negative balance score (balance = hope score – hopelessness score) and positive-negative total affect score (total affect = hope score + hopelessness score).

RESULTS AND DISCUSSION

We can see standard deviation for total affect is higher in pupil sample, than it is in student sample (Table 2). The difference is significant. It may be proved that both two-dimensionality of BHS in pupil sample and one-dimensionality of BHS in student sample highly probably follow from this very fact (under one additional condition). Statistics states that the correlation between two variables may be considered as the ratio of standard deviations for their sums and differences (e.g. [17]; see also [9]). If SD for sums is lower than SD for differences then there is inverse correlation between the variables. The more the difference between these two values (SD for sums and SD for differences) is, the stronger is this inverse correlation. Hence, the data represented in Table 2 may be understood as follows: due to higher variation of total affect in the pupil sample in comparison with student sample and due to absence of differences between the samples in SD for balance (this is the abovementioned additional condition) the strength of inverse correlation between hope and hopelessness is lower in the first of these two samples as compared to the second one. The latter one in its turn is a probable explanation of the fact that in pupil sample a two-dimensional factor structure of BHS was obtained while in student sample it was one-dimensional.

Table 2

Descriptive statistics for the hope-hopelessness scale indexes in pupil sample and student sample

Index	Means			Standard Deviation		
	Pupil sample	Student sample	*p* <	Pupil sample	Student sample	*p* <
Hopelessness (N)	2.01	1.98	*ns*	0.48	0.46	*ns*
Hope (P)	2.96	2.87	.0005	0.45	0.39	.0025
Balance (P-N)	0.95	0.89	*ns*	0.78	0.79	*ns*
Total affect (P+N)	4.97	4.85	.0001	0.51	0.32	.0001

Note. Significance levels (*p*) in data columns 3 and 6 refer to tests for the equality of dependent means or dependent standard deviation.

In other words, the data obtained in the study testify that interdependence degree between positive and negative emotions, i.e. one-dimensionality or two-dimensionality of scales designed for evaluation of them (such as BHS) may be determined by the degree of differentiality of population in total emotional activation (total af-

fect) parameter. An interesting fact is that according to data represented in Table 2 the difference in SD for total affect is mainly contributed by SD for hope. This fact may be understood as complying with the idea that intermediate hope-optimism level is the most functional one whereas too low or too high level might decrease performance (e.g., [20; 22]). There is still one question that remains unanswered: why we did not obtain this kind of data for hopelessness-pessimism. As for McDougall's hypothesis [16], I still consider it theoretically convincing and requiring further development and verification, despite it was not proved in the present study. Though, with regard to the data obtained in this study, the limits of this hypothesis' performance might appear not as broad as they seemed to be prima facie.

The Literature

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Appendix

Hope-hopelessness scale items

Pos 1.	I look forward to the future with hope and enthusiasm.
Pos 3.	When things are going badly, I am helped by knowing that they cannot stay that way forever.
Pos 5.	I have enough time to accomplish the things I want to do.
Pos 6.	In the future, I expect to succeed in what concerns me most.
Pos 7.	I happen to be particularly lucky, and I expect to get more of the good things in life than the average person.
Pos 10.	My past experiences have prepared me well for the future.
Pos 13.	When I look ahead to the future, I expect that I will be happier than I am now.
Pos 15.	I have great faith in the future.
Pos 19.	I can look forward to more good times than bad times.
Neg 2.	I might as well give up because there is nothing I can do about making things better for myself.
Neg 4.	I can't imagine what my life would be like in ten years.
Neg 8.	My future seems dark to me.
Neg 9.	I just can't get the breaks, and there's no reason I will in the future.
Neg 11.	All I can see ahead of me is unpleasantness rather than pleasantness.
Neg 12.	I don't expect to get what I really want.
Neg 14.	Things just don't work out the way I want them to.

Neg 16.	I never get what I want, so it's foolish to want anything.
Neg 17.	It's very unlikely that I will get any real satisfaction in the future.
Neg 18.	The future seems vague and uncertain to me.
Neg 20.	There's no use in really trying to get anything I want because I probably won't get it.

Note. Neg = hopelessness item; Pos = hope item. The items were presented in the order shown in [1], and not in the order given here.