RELATIONSHIPS BETWEEN BANNISTER'S INTENSITY AND CONSISTENCY IN VERBAL AND NON-VERBAL GRIDS

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This article investigates relationships between verbal and non-verbal equivalents of Bannister's intensity and consistency. It recalls a variant of a grid technique that enables one to construct parallel verbal and non-verbal versions. The obtained non-verbal measures indicate lower tightness than verbal measures. Both types of measures correlate significantly with each other. This convergence of verbal and non-verbal construing is interpreted in accordance with the so called 'generality hypothesis.' An analysis of relationships between verbal intensity and verbal consistency shows their nonlinear relationships. The current results are compared with previous findings and the question of validity of the measures is discussed.

Keywords: Bannister's intensity, non-verbal grids, non-verbal construing, consistency, projective techniques

INTRODUCTION

Bannister's indexes of intensity and consistency are classical summary measures of the structure of construct systems. Numerous studies have investigated and discussed their theoretical and empirical relevance. To date, nearly all of them have derived intensity and consistency from verbal variants of grids. This is characteristic for the investigation of other grid measures as well. This study attempts to take into consideration non-verbal variants of intensity and consistency, which may in turn serve as a reflection of general relationships between verbal and non-verbal construing.

THEORY

Bannister's intensity – background

Bannister's intensity is usually mentioned as a summary grid measure based on correlations among constructs (e.g. Fransella, Bell & Bannister, 2004). This may imply that this measure is derived from a grid consisting of elements and bipolar constructs. Although this is the case of many studies (e.g. Adams-Webber, 2003; Baldauf, Cron & Grossenbacher, 2010; Dingemans, Space & Cromwell, 1983; Epting, Prichard, Wiggins, Leonard & Beagle, 1992; Krauthauser, Bassler & Potratz, 1994; Smith, 2000), pioneering studies were different. Bannister (1960, 1962) and Bannister and Fransella (1966) originally proposed the measurement of intensity through grids consisting of elements in columns (e.g. persons) and their separate mono-polar characteristics (e.g. *good*, *selfish*) instead of bipolar constructs (e.g. *good* versus *selfish*) in rows.

Bannister (1960, 962) assumed that the characteristics of elements label poles of bipolar constructs (e.g. *good* may label one pole of the construct *good* versus *selfish*). Therefore he termed them *constructs* even though they do not express explicitly bipolar relationships. This may be confusing because this term in the psychology of personal constructs (PCP) implies a bipolar structure. In order to clarify the terminology we will call the characteristics not constructs but *attributes*. Furthermore, we will call the elements/attributes form of grids the *mono-polar* grids in order to distinguish it from the classical bipolar grids.

Data of mono-polar grids can be binary (i.e., a respondent determines which elements from a list possess a particular attribute; e.g. Bannister, 1960, 1962) or ordinal (i.e., a respondent ranks a set of elements in respect to possessing an attribute; e.g. Bannister & Fransella, 1966). Table 1 shows an example of a mono-polar grid with binary data. Crosses denote that a given element possesses a given attribute, blanks mean the opposite.

Mono-polar grids are still used from time to time, both in research and in practice. However, the method of dealing with data differs from Bannister's original approach. For example, Ravenette (2003) described an original variant for a work with children consisting of drawings of faces as attributes and important others as elements. He used cluster analysis for obtaining a structure of the construct system. Gara, Rosenberg and Mueller (1989) used a mono-polar grid in an investigation of constructions of self. However, they did not link this method with the fundamental assumption of bipolarity of personal constructs and analyzed data in order to gain a structure of mono-polar concepts.

General assumptions of Bannister's analyses of mono-polar grids are that attributes with identical row patterns match in characterization of persons and refer to one pole of the presumed construct (e.g. *kind, good* in Table 1). Attributes with inverse row patterns have opposite meanings and refer to contrast poles of the construct (e.g. *good, selfish*). Attributes the rows of which are neither identical nor inverse (e.g. *selfish, generous*) do not have such 'intensive' relationships and refer to different constructs.

Table 1: *Example of a monopolar grid*

	Self	Best friend	Boss	Partner	Total
kind		x		x	2
good		x		x	2
selfish	x		x		2
generous			x	x	2

The level of matching and inverse matching of any two attributes in the mono-polar grid with binary data is expressed as a unique index – the split matching score (Bannister, 1960, 1962). The algorithm utilizes the fact that, in the mentioned studies, raw patterns have a constant sum which is a half of the whole set of elements (in the presented example, all rows have a constant sum 2; see Table 1). This was determined by an instruction when a respondent was given an attribute (e.g. *kind*) and he or she was asked to select a half of the elements (persons on photographs) possessing this attribute (i.e. two of the four elements in the presented example). Then, the same procedure was repeated by another attribute and so on until all attributes were evaluated.

For computing the split matching score, a matrix with a simple matching index was determined. This matrix contained elements in columns and pairs of attributes in rows (see Table 2). Matching scores represent a simple measure of association between attributes. A cross in the table denotes an existing association between attributes – any case when two attributes are simultaneously related to a given element or are simultaneously not related to a given element (e.g. both *kind* and *good* are related to 'best friend' and are not related to 'self'). The other cases – when just one attribute from a pair is related to an element – are represented by blanks, which corresponds with an absence of association between attributes (e.g. *selfish* is related and *good* is not related to 'self'). The matching scores are row totals.

Table 2: *Matrix with matching scores*

	Self	Best friend	Boss	Partner	Matching score	Split matching score
kind – good	x	x	x	x	4	2
kind – selfish					0	2
kind – generous	x			x	2	0
good – selfish					0	2
good – generous	x			x	2	0
selfish – generous		x	x		2	0

Considering Table 2 it is obvious that identical row patterns in Table 1 yield a maximum matching score (4), inverse patterns yield no match (0), and the other pairs yield a value in the middle (2).

The binomial chance expectancy for a matching score on a 4-element grid is 2. This corresponds to a random grid where attributes are not associated and they do not form bipolar constructs. The split matching score is determined as a deviation from this value; it is an absolute value of a difference between the matching score and 2 (chance expectancy). The higher the value, the stronger the relationships between attributes. Finally, intensity for the whole grid is calculated as a sum of split matching scores (i.e. 6 for Table 2).

In mono-polar grids with rank orderings, the relationships among attributes are expressed as Spearman's rhos calculated for each pair of attributes. These rhos are squared and multiplied by 100. The sum of these scores is again interpreted as intensity (e.g. Bannister & Fransella, 1966).

This correlation approach can be applied not only to mono-polar grids but also to standard grids with bipolar constructs containing rank orderings. The difference is that in this case intensity is based on correlations among bipolar constructs, not among mono-polar attributes (e.g. Dingemans et al., 1983).

Bannister's consistency – background

Simultaneously with intensity Bannister (1960, 1962) introduced a measure of consistency. Consistency is a correlation of construct structures identified in an initial test and in a subsequent re-test. For example, in Bannister (1960, 1962) split matching scores of attributes in the first grid are correlated with their equivalents obtained in a re-test. In Bannister and Fransella (1966) and in Bannister, Fransella & Agnew (1971), where mono-polar grids with ordinal data are used, initial and re-test structures of attributes expressed as Spearman rank order correlations are correlated.

In the earlier studies the re-test contained different elements from the initial test (e.g. Bannister, 1960, 1962). In other studies the re-test and initial test were identical (e.g. Bannister & Fransella, 1966; Bannister, Fransella & Agnew, 1971). Both approaches aim to determine the same measure of consistency although their procedures differ considerably. The former index expresses to what extent a construct structure applied on one set of elements is used on the other. The latter index determines a stability of a construct structure when the same grid is exposed once again. Consistency in this latter form is held to this day (e.g. Fransella et al., 2004). The difference between both approaches is important and is reflected sufficiently neither by the mentioned authors nor by secondary literature (Fransella et al, 2004).

Similar as intensity, consistency may be derived both from mono-polar (e.g. Bannister, 1960, 1962, Bannister & Fransella, 1966; Bannister, Fransella & Agnew, 1971) and bipolar grids (e.g. Feixas, Moliner, Montes, Mari & Neimeyer, 1992). In the latter case structures of bipolar constructs (and not of mono-polar attributes) obtained in the initial test and re-test are correlated.

Relationships between intensity and consistency

Regarding the method of calculation, intensity reflects strength of relationship among constructs. In PCP terms the intensity score is often interpreted as a measure of cognitive complexity (e.g. Adams-Webber, 2003; Baldauf, Cron & Grossenbacher, 2010; Epting, Prichard, Wiggins, Leonard & Beagle, 1992; Krauthauser, Bassler & Potratz, 1994; Smith, 2000). However, Bannister proposed intensity originally for measuring *tightness* of a construct system (as opposed to *looseness*; Bannister, 1960, 1962).

By definition tight constructs lead to unvarying predictions (Kelly, 2001). Construct systems with a high degree of intensity lead to unvarying predictions because categorization within one attribute implies categorization within other attributes. Following Bannister's (1962) argument, if 'the best friend' was categorized as *kind*, he/she is also categorized as *good* because the two attributes have identical patterns (Table 1). On the other hand, 'loosening' is connected with a decrease of intensity. If 'the best friend' was categorized occasionally once as *kind* and once as not kind (e.g. *selfish*), the relationship between the two row patterns becomes changing and unstable. Then, to construe 'the best friend' as *kind* does not imply to construe him/her as *good* any more. Thus, the varying use of one attribute leads to the weakening of relationships with other attributes, to a decrease in intensity.

Bannister and his collaborators reported in the above-mentioned papers correlations between intensity and consistency usually higher than 0.5, which is in accordance with the theory. This interpretation of intensity as 'tightness' is supported also by experimental findings (Bannister, 1963, 1965).

However, other authors put emphasis on distinct interpretations of both measures. Haynes and Phillips (1973) asserted that consistency is a direct and more accurate measure of tightness than intensity because it affects its fundamental aspect – the absence of variation. They supported this claim empirically. Similarly, Dingemans, Space and Cromwell (1983) argued that consistency is a proper measure of tightness because it fits well with Kelly's definition mentioned above, which cannot be said about intensity.

The ambiguity in the interpretation of both measures may also stem from the fact that intensity describes a construct structure at a particular time while consistency describes a change between two grids over time (i.e. it identifies a process).

Intensity and consistency derived from verbal and non-verbal constructs

PCP reflects, as many other theories of personality and psychotherapeutic approaches, a distinction between verbally and non-verbally structured experiences. The interest in exploration of non-verbal experiences or non-verbal constructs is motivated by various reasons. For instance, children may express their construing more easily through drawings than through words (e.g. Bell & Bell, 2008; Butler & Green, 2007). The work with non-verbal material also has a place in work with adults. According to Kelly (2001) important levels of our construing are preverbal, which means that they were formed before language acquisition. These constructs may be better accessible through non-verbal stimuli. Kelly (2001) also mentions work with dreams as a possible way of producing loosening or painting as a technique producing dilation. In general, using non-verbal material may serve as a source of inspiration, as a tool for expressing the 'inexpressible' or as a facilitator of loosening and creative reconstruction.

These theses are somewhat simplified. Verbal artifacts, such as poems, may express the inex-

pressible and be a source of inspiration and creativity, as well. The psychoanalytical verbal technique of chain association may produce loosening (Kelly, 2001), similar to the work with dream images. On the other hand, a non-verbal artifact such as a schematic sign of a tree may bear nearly the same trivial meaning as a verbal sign 'tree'. Thus, the distinction between verbal and non-verbal should not be interpreted too literally. The sort and the nature of verbal or non-verbal material and the way how we deal with it is important, as well. Various authors put emphasis on work with non-verbal material because they acknowledge its great potential to facilitate creativity and to deal with hardly accessible levels of experience or construing.

The tradition of research with grids is strongly restricted to verbal construing. There are attempts to use constructivist measures to describe non-verbal construing (e.g. constriction – Hannieh & Walker, 2007). Nevertheless, such studies do not systematically compare verbal measures with their non-verbal equivalents. The reason may be due to an incomparability of procedures of eliciting non-verbal constructs (e.g. work with drawings – e.g. Bell & Bell, 2008, dream analysis – e.g. Kelly, 2001) with procedures of eliciting verbal constructs (typically through grid tasks).

Mono-polar grids are suitable tools for diagnostics of both verbal and non-verbal construct systems in comparable ways. They enable one to construct parallel versions with verbal and non-verbal attributes that have equivalent instruction, equivalent data structure, and equivalent principles of data analyses.

In this paper dealing with verbal attributes on the one hand and with non-verbal attributes on the other during the administration of mono-polar grids is investigated. The verbal attributes are adjectives with relatively explicit and shared meanings (e.g. *kind*, *mean*). On the contrary, the non-verbal attributes are constructed to have an opposite 'projective' nature – they are vague, poorly structured and bear no explicit or shared meaning. As this article considers intensity and consistency at both verbal and non-verbal aspects, it is necessary to postulate their hypothetical relationships.

The first question is how levels of verbal and non-verbal indexes should differ. It was already argued that using non-verbal material can produce loosening. Moreover, the attributes in non-verbal grids in the current study do not bear any definite or stereotypical meanings; they may be interpreted in many ways that may, in fact, vary through the test completion. This implies that non-verbal intensity and consistency should be lower than respective verbal indexes, especially when intensity and consistency are regarded as the measures of tightness.

The second question is whether the verbal and non-verbal measures should converge. This issue relates to the problem of generality of structural features of construct systems. In the PCP literature two alternatives are considered. First, it is possible to interpret these features as general tendencies that are comparable to traits or cognitive styles. For instance, a person who construes elements highly consistently in the verbal level should tend to do the same also in the non-verbal level. Bieri and Blacker (1956) provided evidence for this hypothesis. They found a convergence between Bieri's complexity measure of construing people in the Repertory Grid and complexity of perception of Rorschach inkblots. On the other hand, several studies (Bannister & Salmon, 1966; McPherson, Armstrong & Heather, 1975, 1978; Van den Bergh, De Boeck & Claeys, 1985) found that construing of physical objects and people in terms of intensity and consistency differs considerably. In the current study only levels of construing (verbal – non-verbal) and not kinds of elements (people – objects) are manipulated. Correlations of verbal and non-verbal indexes would support the generality hypothesis.

SAMPLE

The sample (originally tested as a control group in a clinical project) was composed of 37 volunteer respondents (19 women, 18 men), graduate and undergraduate students of social sciences. The average age was 22.81 (SD = 1.81), ranging from 20 to 27 years.

METHOD

Four versions of mono-polar grid tests with binary data were created through a combination of two different sets of elements – one for initial tests, one for re-tests – and of two sets of supplied attributes – one for non-verbal and one for verbal versions.

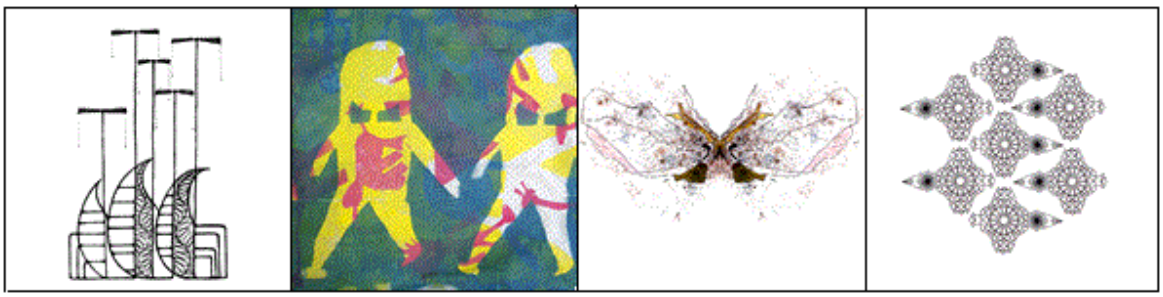

Figure 1: *Samples of attributes*

Each set of elements consisted of 8 photo portraits (faces) of adult persons (4 male, 4 female) unknown to the respondents[1]. The elements within each set were administered to each respondent in a fixed order.

The set of verbal attributes contained 16 verbal adjectives: *generous*, *unusual*, *unreliable*, *mean*, *good*, *kind*, *narrow-minded*, *rude*, *selfish*, *lazy*, *timid*, *ambitious*, *serious*, *intelligent*, *honest*, *well-educated*. This list was inspired partly by lists in Bannister's studies (Bannister, 1960, 1962; Bannister & Salmon, 1966).

The non-verbal set contained 16 pictures (see Figure 1 for examples). Their construction had to strengthen the difference from the verbal attributes. The aim was to avoid non-verbal attributes with stereotypically trivial meanings. We expected that such attributes would simply substitute words (e.g., a picture of a shining sun would substitute attributes like *good* or *kind*, etc.). Therefore the nature of non-verbal attributes had to be different. The pictures had to fulfil two conditions: (1) they had to be interesting for the respondents, evoke a wide variety of meanings, associations, feelings or interpretations, (2) they had to have a projective nature; they had not bear any clear or stereotypical meanings.

The non-verbal attributes were created by a professional artist and designer, and were evaluated by three other people with respect to fulfilling the two conditions. Examples of several attributes are in Figure 1.

Such non-verbal attributes are poorly structured and vague. It may be argued that respondents will deal with them quite unsystematically or randomly. An alternative to this hypothesis claims that respondents will deal with such projective material according to their individual interpretations and that there will be some order in their responses, even though not necessarily consciously reflected. This alternative is in accordance with general assumptions of projective techniques like the Rorschach test that seeks an order behind spontaneous reactions to poorly structured stimuli, which can be an effective method of psychological assessment.

The four mono-polar grid tests were created by the combination of two element sets and two attribute sets and were administered to each respondent in the following order:

[1] The sample of respondents was included into a broader clinical study. For this reason the set of elements within the initial tests contained also elements 'self' and 'ideal self' that were administered after the 8 photos. Data from these two additional elements are not considered in this paper because the two initial grids would be larger (10 elements) than the two re-test grids (8 elements) and therefore would be, in some respects, hardly comparable with them.

1. Elements for the initial test, non-verbal attributes.
2. Elements for the initial test, verbal attributes.
3. Elements for the re-test, non-verbal attributes.
4. Elements for the re-test, verbal attributes.

In contrast to Bannister's approach, where elements (persons) are assigned to attributes (Bannister, 1960, 1962), we used a reverse instruction and asked the respondents to assign attributes to elements. This is due to the fact that, in the non-verbal form, it appeared for respondents to be quite unnatural and difficult to assign elements to non-verbal attributes.

Each of the four grid tests was administered as follows: The grid test was introduced as a method for mapping respondent's own way of understanding other people. A respondent was given the whole set of attributes (spread on a table) and the first element (a photo). Then he/she was asked to characterize the person in the photo using half the attributes (i.e. 8 out of 16). The respondents were usually able to do this task without any other explanations. If they sometimes asked what was the meaning of some attribute (usually of a non-verbal attribute), they were told that it is up to them. If they sometimes found it hard to assign all the 8 attributes, they were told that they may assign also those attributes that the element might have occasionally. When the respondent finished the task, he/she was given another element and so on until the last eighth element was characterized. The time for completion of each grid was recorded.

Additionally, 10 random grids of the same size were generated in order to compare them with real data.

Data analysis

Intensity and consistency

The collected data has the same structure as the example in Table 1. Bannister (1960, 1962) calculated the intensity index as the sum of split matching scores determined for all pairs of attributes. In terms of this article these scores express how two attributes or two row patterns are identical or inverse (see above). The split matching score utilizes the fact that sums of row attribute patterns are constant. However, this is not the case in this study. Since the instruction is reverse, the column element patterns and not the row patterns are constant. Then a modified expression of relationships among attributes needs to be employed.

The modified algorithm considers the level of matching and non-matching among attributes, as well. This is determined from a transformation of the original data matrix. The matrix transformed for this purpose (Table 3) contains pairs of elements in columns and original attributes in rows. Binary data in cells indicate similarities (cross) and contrasts (blank) of elements within the pairs. Analogically, as in Bannister (1960, 1962), it is assumed that two elements are similar if and only if they simultaneously possess or simultaneously do not possess a given attribute. In other cases they are in contrast. For example 'self' and 'boss' are similar as they are both *selfish*. They are also similar with respect to *kind* because none of them possesses this attribute. With respect to *generous* they stay in contrast as 'boss' is *generous* but 'self' is not.

Table 3: *The transformed matrix*

	Self-Best friend	Self-Boss	Self-Partner	Best friend-Boss	Best friend-Partner	Boss-Partner
kind		x			x	
good		x			x	
selfish		x			x	
generous	x					x

Now it is easy to analyze how the attributes match with each other in the specification of similarities and differences. Table 3 shows that the first three attributes match perfectly with each other, whereas *generous* matches with them only in two out of six cases (by 'self'-'partner' and by 'best friend'-'boss'). This corresponds to the above-mentioned finding that the three attributes have either similar or inverse row patterns (see Table 1). In other words, intensity of their relationships is maximal.

The level of overall intensity is quantified in the following way: For each pair of attributes a matching score is obtained as a sum of matching cases (e.g. 6 for *kind-good*, 2 for *kind-generous*, etc.). The average of these matching scores is intensity. In contrast to the original approach (Bannister, 1960, 1962) the matching scores are not totalled but averaged. This is because some respondents did not use all 16 attributes[2]. These were excluded from the analysis, so the number of matching scores for pairs of attributes was lower in such reduced grids. Consequently, their sums would not be comparable with sums derived from grids with all of attributes. Therefore the average of the matching scores is more appropriate here.

Intensity was calculated separately for each of the four grids. Because Bannister's studies (1960, 1962) do not deal with such particular indexes of intensity but only with an overall index that includes intensity both of the initial test and of the re-test, counterparts of this intensity were determined here as well – mean verbal intensity of two verbal grids and mean non-verbal intensity of two non-verbal grids.

Consistency was determined similarly as in the original studies (Bannister, 1960, 1962) as the Pearson's correlation between the matching scores among attributes in the initial test with their equivalents in the re-test. In contrast to the original studies the correlations were not squared and multiplied by 100 in order to obtain 'variance in common' scores. Some correlations were negative, so their squaring would change consistency into the reverse (i.e., attribute correlating negatively would appear to be consistent after the squaring). Thus, the correlation coefficients were considered as measurements of consistency.

RESULTS

The mean time needed for the completion of the initial non-verbal and verbal test was 8.6 and 11.5 minutes, respectively. The mean time for the non-verbal and verbal re-tests was 7.6 and 8.8 minutes, respectively[3]. Descriptive statistics of considered variables are shown in Table 4.

According to the Sign test, verbal consistency is significantly higher than non-verbal consistency ($Z=-2.30$, $p<0.05$); mean verbal intensity is significantly higher than mean non-verbal intensity ($Z=-2.63$, $p<0.01$). Intensity derived from the random grids is significantly lower than all the other intensity measures (Mann-Whitney U Test; $p<0.001$ for all three verbal intensity measures, for mean non-verbal intensity and for re-test non-verbal intensity; $p<0.01$ for non-verbal intensity in the initial test).

Table 5 presents Spearman's rank ordered correlations of the measures.

DISCUSSION

Verbal – non-verbal relationships

The differences between verbal and non-verbal consistency and between verbal and non-verbal intensity are in accordance with the hypothesis

[2] From all 148 administered grids (4 grids by 37 respondents) in 22 grids (9 verbal and 13 non-verbal) one attribute was not used at all; furthermore in one verbal grid and two non-verbal grids using of two attributes was avoided. The neglected verbal attributes were typically adjectives with negative connotations (*rude*, *lazy*). There were no non-verbal attributes that were noticeably neglected more frequently than others.

[3] The initial tests originally had a larger list of attributes (i.e. including 'self' and 'ideal self'). The mentioned interval is an average time needed for the evaluation of the considered 8 elements without the additional two elements.

assuming the loosening effect of purely structured stimuli.

Correlations shown in Table 5 suggest that the verbal measures converge with the non-verbal ones to some extent. The significant correlations are not very high (except the relationships with mean verbal and non-verbal intensity that are statistical artifact). According to standard criteria for evaluation of test validity the correlations should be higher.

Table 4: *Descriptive statistics*

Measure	*Mean (SD)*	*Median*	*Range*
Intensity (verbal initial test)	15.10 (0.84)	15.03	13.50 ... 17.63
Intensity (verbal re-test)	15.03 (0.82)	15.03	13.93 ... 18.61
Mean verbal intensity	15.07 (0.62)	14.93	13.73 ... 16.94
Intensity (non-verbal initial test)	14.86 (0.79)	14.60	13.77 ... 16.83
Intensity (non-verbal re-test)	14.71 (0.53)	14.57	14.03 ... 16.23
Mean non-verbal intensity	14.78 (0.53)	14.71	14.10 ... 16.13
Verbal consistency	0.1 (0.14)	0.10	-0.15 ... 0.43
Non-verbal consistency	0.05 (0.12)	0.05	-0.16 ... 0.33
Intensity (random sample)	14.1 (0.24)	14.1	13.70 ... 14.40

Table 5: *Correlation matrix (Spearman's rho) of the considered indexes*

	2	3	4	5	6	7	8
1. Intensity (verbal initial test)	0.11	0.76**	0.41*	0.19	0.39*	0.25	0.09
2. Intensity (verbal re-test)		0.70**	0.13	0.15	0.18	0.41*	0.38*
3. Intensity (mean verbal)			0.36*	0.22	0.38*	0.38*	0.29
4. Intensity (non-verbal initial test)				0.33*	0.89**	-0.08	-0.05
5. Intensity (non-verbal re-test)					0.70**	0.02	0.14
6. Intensity (mean non-verbal						-0.05	-0.11
7. Verbal consistency							0.42*
8. Non-verbal consistency							

* $p < .05$.
** $p < .01$.

The results enable an alternative interpretation when considering the very different nature of verbal and non-verbal attributes. The former ones (adjectives) have relatively clear meanings, the latter ones enable a much broader variety of interpretations. This had an obvious impact on the respondents' approach to grid completion. Respondents dealt with the non-verbal attributes more quickly. From administrators' point of view, they responded intuitively or even randomly, usually without any attempt to consciously organize their responses. They were also likely to consider the task as a play. On the other hand the respondents dealt with the verbal

attributes apparently more consciously. Regarding these observations, significant correlations between different types of grids could be interpreted as nontrivial and as a support of the generality hypothesis. Particularly, it could be hypothesized that respondents differ from each other in a general tendency to construe people more or less intensively or consistently. This tendency influences their completion of different but convergent forms of grids. It must be pointed out that one finding, a weak correlation between re-test verbal and non-verbal intensity, is not in accordance with this interpretation.

The moderate significant correlation between non-verbal intensity in the initial test and in the re-test supports the generality hypothesis as well. In this case the generality would mean that respondents who were likely to construe elements in the initial test more or less intensively tended to do the same when construing different elements in the re-test. However, this kind of generality is not replicated in verbal grids.

Intensity – consistency relationships

Bannister (1960, 1962) reports mean values of consistency for a nonclinical sample of 50 and 36 (squared values multiplied by 100) that correspond to mean correlations of 0.7 and 0.6. In the present study levels of consistency were much lower, often close to zero. The question is how such a big difference could occur.

It could be argued that the levels of consistency close to zero show randomness of participants' responses. However, zero consistency does not necessarily indicate that the data are random. It merely indicates no relationship between construct structures in the initial test and in the re-test. Next, if the derived measures were random variables, they should not correlate, which is not the case. Finally, there are differences between random grid intensity and intensity of respondent's grids. A further analysis should clarify the issue of low consistency.

Table 6: *Parameters of linear and quadratic models*

Type of model	*Equation*	R^2 *(Coefficient of determination)*
Linear	intensity = 14.88+1.82*consistency	0.18**
Quadratic	intensity = 14.86–1.56*consistency+12.28*consistency^2	0.43***

** p <.01
*** p<.001

An important finding is that a correlation between verbal intensity and consistency replicates findings of previous studies. However, these report stronger relationships (e.g. 0.71 in Bannister, 1962). Figure 2 helps to better explore the relationships between mean verbal intensity and consistency. The graph suggests that the relationship can be nonlinear – the higher the consistency, the higher the intensity, but the lower the negative consistency, the higher the intensity.

Table 6 enables comparisons of two regression models derived from data (linear and quadratic) with mean verbal intensity as a dependent variable. It shows that the quadratic model explains a greater proportion of variance of mean verbal intensity than the linear model. The regression line and curve are displayed in Figure 2.

One may wonder whether negative values of consistency were considered in the previous studies. Bannister (1960, 1962) does not report the range of consistency, just mean and standard deviation of its squared values multiplied by 100. In particular samples mean levels of consistency were quite low with a relatively high standard deviation (e.g. mean of 10.25 with standard deviation of 20.4 in a sample of schizophrenic patients, which corresponds to a correlation of 0.32). This suggests that there could be at least

several negative cases of consistency in such a sample. Assuming that the relationship with verbal intensity was nonlinear as well, the squared version of this measure had to correlate highly with intensity. This effect could partially explain the high reported correlations. Similarly, in the present study, squared verbal consistency correlates with verbal intensity 0.62 ($p<0.01$), which is very close to Bannister's findings. This can also partially explain the higher mean verbal consistency in the previous studies; they could involve squared negative correlations. However, this explanation has no direct support as the non-squared consistency levels are not reported in the original papers.

The estimated quadratic function has its minimum (lowest mean verbal intensity of 14.80) at a consistency level of 0.06, which denotes in fact no relationship between the initial and re-test structures. The combination of the lowest intensity and zero consistency probably corresponds with the most disorganized data. However, this minimal intensity of 14.80 (estimated by the quadratic model) is still higher than the highest intensity (14.40) observed in random grids. This suggests that consistency about zero does not have to mark the total randomness of respondents' data. Of course, some of them could be random but the majority of them exceeds this maximum value of random intensity (see Figure 2).

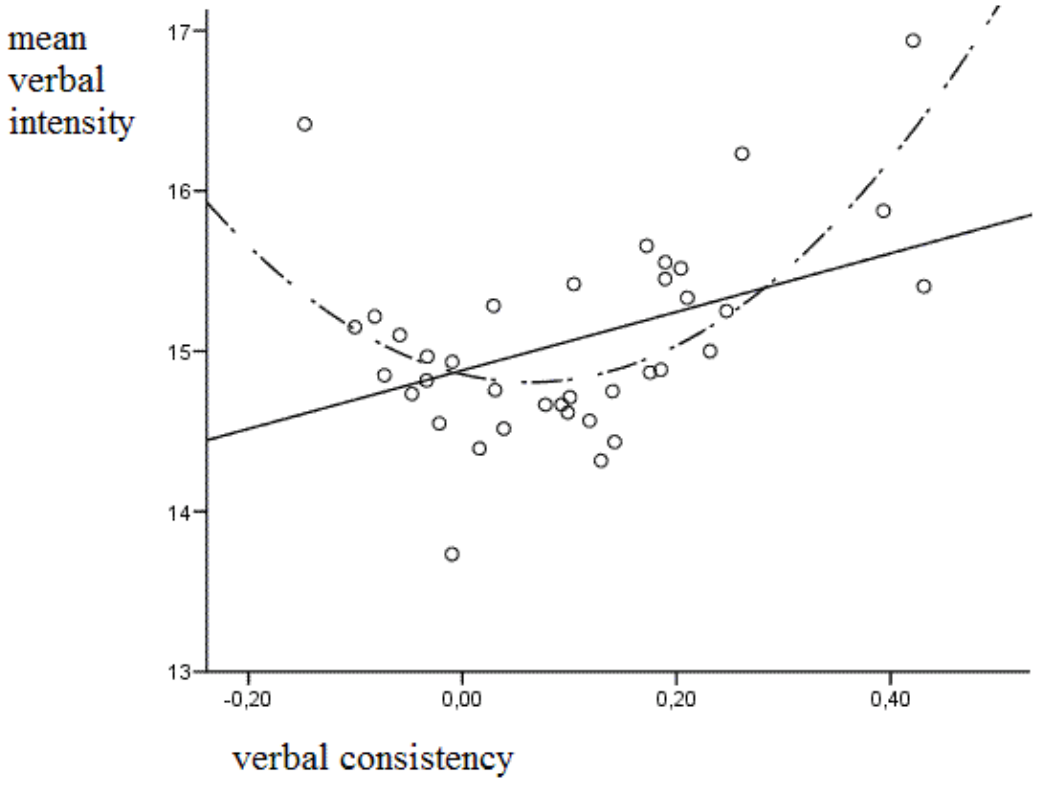

Figure 2: *Relationship between intensity and verbal consistency*

Intensity increases with a distance of consistency from zero. This can correspond with a higher organization of responses. The question is, however, what it means from the psychological point of view. Particularly, what can negative consistency mean? The nonlinear relationship is predicted neither by Bannister's nor by any other PCP theory. It could be argued that respondents yielding negative consistency systematically turned a construct structure in the initial test into some different structure. Attributes with identical or inverse row patterns in the initial test have these relationships with completely different attributes in the re-test. Such effect requires a systematic way of dealing with attributes that could also have an impact on the increase of intensity. However, the lowest negative consistency value is not lower than -0.2, so the question is whether such negative values of consistency close to zero can denote any systematic way of dealing with attributes at all.

CONCLUSION

This study attempted to analyze relationships between verbal and non-verbal construing. It recalls a nearly forgotten technique of monopolar grids and, besides intensity, a measure of consistency in a special variant that reflects a transferability of a construct structure from one domain onto another.

The comparison of the verbal indexes with their non-verbal equivalents provides some evidence of their validity. The results are in accordance with the claim that a work with poorly structured attributes in the non-verbal form will yield a decrease of tightness. On the other hand, despite the different nature of verbal and non-verbal stimuli, the considered verbal measures correlated significantly with their non-verbal variants. This is in line with the generality hypothesis assuming that structural features of construct systems are general trait-like tendencies. Nevertheless, all these findings are somewhat ambiguous as they are not compatible with all statistical results. The limitation of the sample is obvious as well.

The results of the verbal grids are partially compatible with findings of previous studies. An interesting finding is that the relationship between verbal intensity and consistency can be better viewed as nonlinear than linear, which is a puzzle for a PCP interpretation.

The results suggest that data of non-verbal grids are not random and that their organization can be expressed in terms of grid summary measures, such as intensity or consistency. The question is, how the notion of the order behind reactions to vague non-verbal stimuli, which makes these non-verbal grids similar to projective techniques, could be utilized. The limited practical utility of the current results is obvious. The most striking problems are a low range of obtained values of considered measures and the unclear psychological meaning of negative values of consistency. A further research that would manipulate types of elements, attributes, instructions and samples of respondents is needed.

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