A NEW APPROACH TO MEASURING INCONSISTENCY OR CONFLICT IN GRIDS

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Personal construct oriented researchers and clinicians have long been interested in the notion of conflict or inconsistency of construing in repertory grid data. One approach which seemed theoretically promising but difficult to operationalise was built on Heider's balance notion, where relationships among three constructs were assessed for consistency. Here, the same underlying notion is employed but the inconsistency is evaluated between one element and two constructs. This has the advantage of a common approach to inconsistency for both elements and constructs. The approach also permits an evaluation of the variation in conflict within grids and may provide a way of examining movement between tightness (where there is no inconsistency) and looseness (where there may be substantial inconsistency) in construing. The approach is illustrated with a previously published grid and some data for groups of grids.

Keywords*: repertory grid, conflict, inconsistency, balance, triangular inequality, variation in conflict*

CONFLICT IN GRIDS

The notion that people have inconsistencies in their thinking is neither new nor confined to personal construct theory. Daniel Kahneman was awarded the Nobel Prize for Economics in 2002 for his psychological research showing that people were not rational decision makers. Interestingly Kahneman's PhD (see Kahneman, 1963) was based on the semantic differential, a technique producing data not wholly dissimilar to that of the repertory grid technique. The personal construct theory of George Kelly (1955/91) allowed for such inconsistencies in construing through the Fragmentation Corollary.

Subsequently constructivists have been interested in construct systems where there are inconsistencies (Honess, 1982), contradictions (Krauthauser, Bassler, and Potratz, 1994), or conflict (Slade and Sheehan, 1979) among the components of the construct system. While these terms have been used interchangeably [we could also consider it as ambiguity in construing], 'conflict' has been the most widely used term, and will be used here. There have been two distinct approaches to the measurement of conflict in repertory grid data.

In the first and better known approach Slade and Sheehan (1979) adapted Lauterbach's use of Heider's (1946) balance theory where three concepts are assigned positive or negative valances, and balanced triads of concepts have either a pattern of all positive valences or a pattern of one positive and two negative valences (Lauterbach, 1975). Slade and Sheehan proposed using triads of the signs of correlations among three constructs in a similar fashion. Winter (1983) however found the percentage of imbalance triads of constructs to be highly correlated with measures of cognitive complexity.

One issue arising from this measure is the level of correlation at which a triad is designated as 'balanced' or 'imbalanced'. If all correlations are used, whatever their size, then correlations of 0.01 and -0.02 and -0.03 will be said to be balanced. But those correlations most would agree are very likely to be not significantly different from zero, and should therefore not be taken into account as suggesting any relationship. Bassler, Krauthauser, and Hoffman (1992) have suggested a modification to the procedure which would take account of the size of the correlations. In a subsequent empirical evaluation of 140 grids from psychiatric patients, Krauthauser, Bassler, and Potratz (1994) found that large numbers of imbalanced triads were rare, and that the presence of imbalanced triads was affected by the number of constructs (more constructs led to more imbalanced triads) and the number of elements (fewer elements led to more imbalanced triads). Monolithic construing was also associated with more imbalanced triads.

Another measure of conflict or ambivalence that could be used with specific kinds of grids in which figures were seen as both elements and constructs was suggested by Fransella and Crisp (1971)

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The present approach combines aspects of both these approaches; assessing triads for balance, but forming triads from both elements and constructs. The genesis of this idea lies in Lauterbach's original example. (I like parties, I don't like depression, but alas I associate parties with depression).These concepts can be interpreted as one element ('I') and two constructs, *going to parties or not* and *depressing or not*.

Here we adopt the position that Conflict/Inconsistency/Contradictions will exist in a grid where either of the following two conditions hold:

1. An element is at the same time similar or close to two constructs which are themselves different or distant.
2. An element is similar or close to one construct's pole and at the same time is different to or distant from another construct's pole, where the two construct poles are similar or close.

This can be operationalised in the following way.

1. Define relationships between constructs and elements, and among constructs, as distances.
2. Let the rating of an element on a construct be the distance between that element and the construct. The rating will designate one pole as the basis of the distance, it is immaterial which pole it is, since reversing the construct ratings will change all three distances and the relationship among them is preserved.
3. Let the distance between constructs be determined by the average distance determined from all other elements.
4. We then define the presence of conflict as the presence of a 'triangular inequality'. That is, in any three distances defined on three points (one element and two constructs) the longest distance must not exceed the sum of the two smaller distances (in such a case the distances cannot form a triangle). Consider the eight elements rated on three constructs in Table 1 below.

Table 1. *Illustrative Grid Data*

	A	B	C	D	E	F	G	X	
warm	3	4	4	7	6	7	4	1	*cold*
kind	3	5	4	7	7	6	2	6	*cruel*
harsh	5	3	1	1	1	2	7	1	*gentle*
7	*< Ratings >*								*1*

Element X is both Cold and Kind and Cold and Gentle. The distances between the constructs are shown in Table 2.

Table 2. *Construct Euclidean Distances*

(There is an error in this table, see ***Errata*** *at the end of the article, added 22 August 2014)*

kind vs cruel	5.7	
harsh vs gentle	10.4	*12.4*
	warm vs cold	*kind vs cruel*

The sum of the distances from X to *warm vs cold* and *kind vs cruel* is 1 + 6 = 7, but the distance from *warm vs cold* to *kind vs cruel* is only 5.7. The triangular inequality is not satisfied and there is conflict. Also the sum of the distances from X to *warm vs cold* and *harsh vs gentle* is 1 + 1 = 2, but the distance from *warm vs cold* to *harsh vs gentle* is 10.4. Again the triangular inequality is not satisfied and there is conflict.

1. This simple example is a relatively easy one in which to detect such conflict. However the number of possible conflict situations in a grid is NE * NC * (NC – 1) / 2, where NE is the number of elements and NC is the number of constructs. Thus in this tiny example there are 8 by 3 by 2 divided by 2 equals 24 possible conflict situations. In an ordinary grid, say 10 by 10 there would be 450.
2. We then define overall conflict as the ratio of observed conflict situations to possible con-

flict situations. The overall conflict may be partitioned to identify proportions of conflict attributable to each element and each construct.

3. Variation in conflict within a grid may also be important. Since it seems likely that there will be a certain degree of error or random conflict in any grid, we could assume that such conflict will be distributed randomly across elements and randomly across constructs. A null hypothesis for these distributions of conflict across elements and constructs is that it they are uniform distributions. If we make such as assumption we can use departures from such a distribution to indicate the presence of systematic rather than error conflict. We could find the average conflict per element by dividing the total conflict by the number of elements and compare this to the actual conflict attributable to each element. These could be combined by summing the ratio of squared discrepancies over the square expected (average) conflict to give a pseudo-chi-square measure. While this could not be tested for significance[1], it could be transformed into a standardized measure, Cramer's V[2], whose values range from zero - no departure from the expected values, to a maximum of 1.0 which would enable conflict variation to be compared across grids.

There are a number of advantages to this approach. The procedure involves both elements and constructs and can be applied to any repertory grid data, and involves minimal departure from the actual grid data. Element – Construct distances are taken directly from the grid, while the estimation of the between construct grid retains the grid data properties. Unlike correlation approaches there is no data standardization, and as with distances, conflict is invariant over construct pole reversal. The outcome can be interpreted at grid, element, construct, and element by construct level.

[1] Because of the lack of independence of the cell frequencies (based on the same constructs for elements or the same elements and constructs for constructs) the chi-square calculated cannot be tested for significance.

[2] Cramer's *V* is the square root of the ratio of the value of chi-square to (in this case) the number of conflicts found. This coefficient has a minimum of zero and a maximum of 1.0. It is also equal (in this case) to the phi coefficient.

AN EXAMPLE

As an example we consider a grid published by Leach, Freshwater, Aldridge, and Sunderland (2001). This was a grid completed prior to therapy with a victim of child sexual abuse. It had fourteen constructs and nine elements, giving a total of 819 potential element-construct conflict situations. In 340 of these situations (42%) conflict was observed. The distribution of conflict by construct and element is shown in Table 3.

Table 3. *Percentage of 340 Conflict Instances by Construct and Element*

Construct	%		Element	%
assertive vs not assertive	8.1		Child Self	*10.9*
confident vs un-confident	7.6		Self Now	*7.9*
does not feel guilty vs feels guilty	9.1		Women in General	*1.8*
abusive vs not abusive	7.4		Men in General	*8.2*
frightening vs not frightening	6.5		Father	*16.5*
untrustworthy vs trustworthy	6.8		Partner	*10.3*
powerful vs pow-erless	6.2		Ideal Self	*14.7*
big headed vs not big headed	6.0		Mother	*10.6*
independent vs dependent	6.0		Abuser in Childhood	*19.1*
confusing vs not confusing	6.9			
guilty vs not guilty	6.2			
cold vs shows feelings	6.0			
masculine vs feminine	7.5			
interested in sex vs not interested in sex	9.6			
	100.0			*100.0*
Index of Conflict Variation	*.109*			*.309*

The index here termed an index of conflict variation is the Cramer's *V* coefficient referred to earlier. In can be seen in this grid the variation in conflict across elements is nearly three times as great as across elements. The abuser in childhood figure has the highest level of conflict. Conflict involving any element can be further examined to see which constructs most often are involved in conflict situations with the element and the other constructs. Table 4 shows how the conflict for this figure was distributed across constructs.

Table 4. *Distribution of conflict across constructs for Abuser figure*

Percentage Conflict	*Construct*
6.9	*assertive vs not assertive*
7.7	*confident vs unconfident*
7.7	*does not feel guilty vs feels guilty*
6.9	*abusive vs not abusive*
6.9	*frightening vs not frightening*
6.9	*untrustworthy vs trustworthy*
5.4	*powerful vs powerless*
5.4	*big headed vs not big headed*
6.2	*independent vs dependent*
5.4	*confusing vs not confusing*
6.2	*guilty vs not guilty*
10.0	*cold vs shows feelings*
8.5	*masculine vs feminine*
10.0	*interested in sex vs not interested*

It can be seen that the conflict for this figure occurs primarily with respect to the constructs *cold vs shows feelings* and *interested in sex vs not interested*. Although it was shown earlier that the number of potential conflict situations in a grid is large, when we have identified a particular element involved in more conflict than others, we can examine directly the discrepancies between this element and all pairs of constructs. Table 5 shows these data. There are 91 possible conflict situations and there is no conflict (discrepancy of zero) in 28 (31%) of these situations. In some situations the conflict is minimal (for example the conflict between *big headed vs not* and *independent vs dependent* is only 0.1). We can see the conflict is most evident for this figure between constructs *cold vs shows feelings* and both *big headed vs not* (3.6) and *masculine vs feminine* (4.1).

These discrepancies can be standardized, and those with z-scores greater than some critical level can be identified. In the above table, the following pairs of constructs (shown in Table 6) reached the 5% level (1.96).

Table 5. *Discrepancies between paired constructs for Childhood Abuser figure.*

	Construct	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
1	*assertive vs not assertive*													
2	*confident vs unconfident*	0.0												
3	*does not feel guilty vs feels guilty*	0.0	0.0											
4	*abusive vs not abusive*	1.1	1.7	2.4										
5	*frightening vs not frightenin*	0.0	0.7	1.4	0.5									
6	*untrustworthy vs trustworthy*	1.1	1.8	2.5	0.0	0.3								
7	*powerful vs powerless*	0.0	0.3	0.7	0.9	0.0	0.9							
8	*big headed vs not big headed*	0.3	0.9	1.5	0.0	0.0	0.0	0.0						
9	*independent vs dependent*	0.0	0.0	0.0	1.3	0.3	1.4	0.0	0.1					
10	*confusing vs not confusing*	0.3	0.9	1.4	0.0	0.0	0.0	0.0	0.0	0.4				
11	*guilty vs not guilty*	1.3	1.9	2.4	0.0	0.0	0.0	0.7	0.0	1.2	0.0			
12	*cold vs shows feelings*	1.9	1.3	0.7	3.3	2.4	3.4	2.6	3.6	1.8	3.2	4.1		
13	*masculine vs feminine*	0.4	0.6	0.7	1.2	0.2	1.2	0.0	0.4	0.0	0.4	1.3	1.7	
14	*interested in sex vs not interested*	*1.3*	*1.3*	*1.1*	*2.1*	*1.1*	*2.2*	*0.7*	*1.2*	*0.0*	*1.2*	*1.7*	*1.0*	*0.3*

Table 6. *Construct Pairs involved in extreme levels of conflict for Childhood abuser figure*.

Z	Construct Pair
2.41	*abusive vs not abusive <> cold vs shows feelings*
2.57	*untrustworthy vs trustworthy <> cold vs shows feelings*
2.79	*big headed vs not big headed <> cold vs shows feelings*
2.35	*confusing vs not confusing <> cold vs shows feelings*
3.24	*guilty vs not guilty <> cold vs shows feelings*

We can similarly examine the conflict by construct, looking at the pair formed by other constructs and element. Table 7 shows the constructs and elements associated at a more extreme level of inconsistency with the construct *masculine vs feminine*.

Table 7. *Element-Construct Pairs involved in extreme levels of conflict for the construct* masculine *vs* feminine.

Z	Element-Construct
2.53	Child Self <> *assertive vs not assertive*
3.44	Child Self <> *confident vs unconfident*
3.40	Child Self <> *does not feel guilty vs feels guilty*
2.67	Father <> *abusive vs not abusive*
2.65	Father <> *frightening vs not frightening*
2.67	Father <> *untrustworthy vs trustworthy*
2.43	Father <> *big headed vs not big headed*
2.45	Father <> *confusing vs not confusing*
2.60	Father <> *guilty vs not guilty*
2.07	Father <> *cold vs shows feelings*
2.60	Mother <> *interested in sex vs not interested in sex*

Analyses of this kind then may inform individual decision-making (or rather question-asking) in the diagnostic-therapeutic setting.

VARIATIONS

In a more normative research oriented setting, we may wish to inquire about expected levels of conflict and distribution of conflict. To exemplify this situation (and not use it as the basis for drawing conclusions beyond slightly idle speculation) we consider two data sets previously analysed in different settings. One data set was first reported in Bell and McGorry (1994) consisting of 111 grids of patients recovering from a psychotic episode. The other data set is the responses of 170 insurance salespeople to grids featuring employment advertisements used by Bell (2000) to demonstrate a way of testing the commonality of constructs. More details about both these grids are also given in Bell, Vince and Costigan (2002). Naively we might expect to see more extreme patterns of conflict in the clinical sample and more consistent patterns in the community sample (although Kahneman might caution us otherwise).

Statistics for the percentage conflict and variation in conflict are shown in Table 8.

Variation across constructs is almost the same for both groups. The community sample grids contain more conflict on average, but have lower levels of variation across elements. However the community sample is more consistent with respect all measures with significantly lower standard deviations. This suggests that the clinical grids were more likely to be either ‘tighter’ with less conflict or ‘looser’ with more conflict. Such a finding might reconcile the contradictory findings by Bell and McGorry (1994) and Lorenzini, Sassaroli, and Rocchi (1989). The former found that grids from recovering psychotic patients were extremely tight or cognitively simple while the latter argued that schizophrenia is characterized by loose things.

DISCUSSION

Both excessive tightness and excessive looseness are associated with less than optimal construing. The indices discussed here, based on inconsistencies in construing, and variations in this inconsistency, might provide an alternative approach to the evaluation of tightness and looseness in construing through the repertory grid. Current measures of conflict based on correlations discard the information from individual elements when evaluating constructs and thus preclude the use of detailed feedback in therapeutic situations about inconsistency in terms of actual grid data. The present approach provides such information.

Table 8. *Differences in level of conflict and conflict variation for two samples* (A: 111 Recovering Psychotic Grids, B: 170 Insurance Job Adv Grids)

		Sample Statistics		Levene's Test for Equality of Variances		*t-test for Equality of Means (separate variance estimates)*	
Index	Group	Mean	Std. Deviation	F	prob	t	*df*
Percent Conflict	A	34.6	8.06	7.0	.009	-5.1*	*174.3*
	B	39.0	5.41				
Element Conflict Variation Index	A	.36	.15	41.5	.000	6.5	*148.8*
	B	.26	.08				
Construct Conflict Variation Index	A	.11	.04	7.7	.006	1.0	*187.8*
	B	*.10*	*.03*				

Kelly (1955, p.514) also suggests that the '*tightness-looseness* dimension is useful in plotting the shifts in the construction process of a single person'. The measurement of 'conflict' or inconsistency of construing as proposed here may prove to be a useful device for monitoring such changes where grids are used serially to monitor the stages of therapy.

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ERRATA (added 22 August 2014)

There is an error in Table 2 in that the table shows total distances not average distances as indicated by the preceding text. As a consequence the paragraph following is also in error. Table 2 and the following paragraph should read as follows:

Table 2. *Average Construct Euclidean Distances*.

Kind/Cruel	1.0	
Harsh/Gentle	4.0	4.3
	Warm/Cold	Kind/Cruel

The largest distance is from X to Kind/Cruel (6) , but the sum of the average distance from Warm/Cold to Kind/Cruel (1) and X to Warm/Cold (1) is only 2. The triangular inequality is not satisfied and there is conflict. Also the sum of the distances from X to Warm/Cold and Harsh/Gentle is 1 + 1 = 2, but the distance from Warm/Cold to Harsh Gentle is 4, and again the triangular inequality is not satisfied and there is conflict.

I should also like to take this opportunity to point out (as I subsequently discovered) the conceptual notion of linking elements and constructs as a balance situation was first put forward by Carroll & Carroll (1981).

Finally I would like to thank Bojan Korenini and Willfred Greyling for drawing the discrepancy in the paper to my attention.

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