PCP 2011 19th International Congress on Personal Construct Psychology
Boston, MA: July 19th-22

A CONSTRUCTIVIST APPROACH TO GRID STUDIES APPLIED TO
AUDITOR GRIDS

Finn Tschudi, professor emeritus, University of Oslo, Psychological Institute, Norway

and

Magni Martens, Senior research scientist, Nofima Norway
Professor (h.c.) emeritus Univ. of Copenhagen, faculty of Life Science, Denmark

Abstract

This article outlines an approach to studying whether there is one or whether there are furthermore approaches to finding appropriate dimensionality are described. These several patterns of grids in a group of persons. Conditions for relying on the mean grid and conditions are illustrated by: A previously published study of grids for Swedish auditors, and a simulation study using random perturbations. The pattern for Swedish auditors is, however, dysfunctional. There is a gap between what the auditors 'deliver' and the expectations they meet from others. Encouraging Kellian sociality and then using exchange grids may be a step in reducing the expectation gap.

Keywords: mean grid, simulation studies, multivariate data analysis, expectation gap, exchange grids
Auditor grids

Kelly (1955) launched grid methods “as a test to be used in a clinical or preclinical setting”, more specifically “for the function which has to do with a list of clinical hypotheses” (p. 219). This neatly fits with the “individuality corollary” (people differ in their construction of events). History has, however, shown that the range of applicability of grids goes far beyond emphasis on individuals. For our purposes it is important to contrast Kelly’s individuality corollary with his communality corollary (similar constructions of experience between two persons imply similar psychological processes). A relevant approach to study this contrast is to give a sample of persons from a given group grids with the same elements and constructs to fill out. A possible objection to this approach is that it violates the personal nature of elements and constructs. In our major example, however, we studied work experiences for a particular group, Swedish auditors.

We are quite skeptical about relying on “tests of significance, p values” which we see as a primary example of adherence to a cookbook, obviating relying on sound discretion. We enjoy the “intraocular traumatic test - you know what the data means when it hits you between your eyes” (Edwards et al., 1963). However, p values, as well as Kaiser’s criterion (for assessing number of dimension in Principal Component Analysis, PCA) are arbitrarily introduced criteria, and may further a mechanistic and distancing approach to science. This point of view is forcibly argued in Ziliak & McCloskey (2008, page 2): “Fit is not the same thing as importance…. Psychologists have developed a fetish for its scientific-sounding rituals…. The substitution of significance for relevance is more than a century old in some sciences”.

Our approach is outlined in Tschudi (1972, 1975) using the constructs manifest and latent in a Spearman type one dimensional tradition, as shown in Figure 1.

Figure 1 about here

Martens & Martens (2001) have further contributed to a multivariate data-analytical approach where both classical, statistical reliability criteria and models for ensuring relevance and validity are included. Partial least squares models (PLS) aim at relating two (or more) sets of data searching for dimensions common to the data-sets: i.e. exploring variance in one data-set (X) that is relevant to another data set (Y).

Figure 2 about here

In our main example with the auditors we could relate many grids to the individual backgrounds variables (e.g. gender, demographic variables, and individual contexts). Cross-validation checks a model by repeatedly taking out different sub-sets from the model estimation and using them as temporary secret test samples, revealing appropriate and valid dimensionality. Below we outline our basic dichotomy - also drawing on Tschudi (2004) - which elaborates what we see as the essence of a constructivist approach to data analysis (and contrast this with a non-constructivist approach).

Figure 3 about here
Auditor grids

This is, however, not an either or dichotomy, later comments on room for “both and”.

Grid patterns when to concentrate on the mean grid

Persons well acquainted with auditors produced individual grids, and emphasis was given on selecting common elements and constructs from this “pretrial group”. The common elements and constructs are listed below.

COMMON CONSTRUCTS

Easy to audit                                    Difficult to audit

Statements not valuable                        Statements very valuable for investors

Not prediction dependent                       Very prediction dependent

Int. control not important                     Int. control very important

Seldom audited                                 Often audited

Compet. not sufficient                         Comp. completely sufficient

Limited effort time                            Great effort time

Statements insignificant                       St. sign. for share price

I. considerations not req.                    Industry considerations required

Statements insignificant                       St. significant for company image

Low audit precisions                           High audit precisions

Not oral info. dependent                      Very oral info. dependent

COMMON ELEMENTS

Financial audit objects:                      Purchase of shares, Stock prices drop, Bad receivables,
                                                Capitalized organization expenses, Interim report, Financial
                                                plan, Transfer prices

Operation audit objects                        CEO comments, Employment terms, Data security,
                                                Productivity, Strategies

Compliance and objects                         Attest routines, Environmental crime

From Øhman et. al. (2006, p. 114)
*Auditor grids*

A better design would be to additionally have each person in the main group add his or her individual, favorite, elements and constructs. This would make it possible to collect all unique constructs in a grid which can also feature all common elements. Would this give a similar structure of the elements as with the common constructs? Conversely; when all unique elements are joined in a grid together with all the common constructs would this give the same structure of the constructs as with the common elements. An example is given in Tschudi (in preparation).

A basic task in this paper is to outline an approach to studying whether there is just one or whether there are several patterns of grids in a group of persons. Conditions for relying on the mean grid are described. A shared pattern may be dysfunctional as will be illustrated for Swedish auditors, and an approach for bringing forth alternative constructions are discussed.

When a group of persons has filled out grids with the same elements and constructs what is “the right things to do”? From the point of view of the communality corollary it might be suggested simply to take a closer look at the mean grid. We have encountered strong objections against this, a favorite argument being that there may well be subgroups with quite different perspectives on the same constructs and elements and we may then risk that the mean will not describe any of the persons. Imagine for instance one group of risk avoiders, another of risk seekers or pronounced sex differences. In such cases the mean would not describe anyone at all! We have also noted that the recent manual by Fransella et al. (2004) does not mention any use of the mean grid.

This raises the problem of the extent to which it may be fruitful to disregard individual differences in a group and concentrate on a single representation for the group, e.g. the mean grid (here consisting of 12 constructs and 14 elements listed above).
Auditor grids

Evaluating representation by the mean grid

We start with looking at the plot from PCA, which shows the relations (correlations) between all the grids. For our Swedish auditors we find the following pattern [76 auditor grids + mean grid]:

Figure 4 about here.

In this case it seems natural to start with the mean grid since this captures a major pattern, the mean grid points in the major direction (principal component 1). The major configuration found in Figure 4 was also revealed in the PLS analysis (with cross-validation).

It may be useful to compare an empirical pattern with patterns from simulated data where we start with a "known" configuration, which may also be considered to be the TRUE, underlying configuration and add different levels of 'noise’, random perturbations. The following example shows the kind of pattern which we then get:

Figure 5 about here.

The pattern here is quite similar to the one in Figure 4 above. There are no clear clusters and the grids have a dominant loading on the first component (39% and 44%) and a minor loading on the second component (4% and 5%). Furthermore the mean grid is a pure representation of the first component and thus epitomizes the common structure (loading 1.000 and .999). The TRUE configuration is almost a pure representation of the first component – loading .985. With more grids this configuration would have been even closer to the mean grid.

Since all grids in Figure 4 are spawned from the same underlying configuration it is no surprise that there are no clear clusters and that the mean captures what we call the TRUE configuration, after all this is often the purpose of a mean! It seems reasonable to say that no clear clusters is a necessary condition for claiming that the mean grid is a reasonable representation of the whole set of grids but it may not also be sufficient. There might yet be possible to identify different clusters e.g. if all the grids from women were in the upper half and in the lower half for men. (A convenient way to check for such possibilities may be to use different colours for representation of different group membership. This is also conveniently done in several PLS programs.) In the present case all possible groupings were intermingled. Nevertheless, this is a topic of various software programs, and will not be discussed further here.

There might still be interesting individual differences in the grids represented in Figure 4. It seems especially important to take a closer look at grids close to zero. Such grids will have a mean correlation close to zero with the other grids. In Figure 4 grid 48 has a mean correlation of .09 with the others. Might it be that (at least sometimes) we should listen to the
**Auditor grids**

Norwegian play writer Henrik Ibsen who in "An enemy of the people" said: "The minority is always right". In the present case, auditor 48 invites special interest. In Figure 4 it is readily seen that he is the one located closest to the zero point, (which would imply a mean correlation of 0 with the others). He did not, however, have a clearly identifiable alternative structure to the one we shall discuss. Auditor 48 and three others who also had clearly deviant patterns were all men with long experience, and none of them were inclined to discuss alternative structures (Olman personal communication, July 2011).

**Number of dimensions**

A frequently used procedure is to look at the percent variance accounted for by a set of principal components - called "goodness of fit" - and decide on an acceptable high number, e.g. 70% and note that this requires, say, three dimensions. We, however, call this "apparent fit", and choose to look for the dimensionality which comes closest to capture the underlying TRUE configuration. By including sufficient number of dimensions "apparent fit" may become arbitrarily close to 1.0 while "TRUE fit" as used to indicate closeness to the latent, underlying configuration. Notice that Figure 5 and Figure 6 are closely related, and it thus seems reasonable to assume that the mean in Figure 5 also is close to the TRUE configuration.

By adapting thinking from conventional theory of psychological testing the correlation between any two configurations can be seen as a product of the correlation each has with the TRUE configuration what is called Spearman structure as represented in Figure 1. Tschudi (1972) labels this TRUE fit in contrast to APPARENT fit, the latter representing what is usually dubbed "goodness of fit". These correlations depend upon the number of dimensions used. If this number is too small this indicates that all relevant information is not taken into account.

In the present example we get, the following total mean correlations for original data .38, after analysis with 1 dimension .32, with 2 dim .40 this also for 3, 4, 5, and 6 dimensions. The mean correlations between the 76 grids and the overall mean are also of interest: For original data .61 after analysis with 1 dimension .45, with 2, 59. then 60. The results here suggest 2 dimensions as appropriate, 1 dimension is too small, and more than 2 does not seem to add anything.
Auditor grids

Discussion of major result

Figure 6 about here

Auditors face a major problem in that they quite often do not ‘deliver’ what stakeholders and other with interest in the firms being audited, accoutrés, expect, e.g. evaluation of Chief Executive Officer’s, CEO’s comments on future possibilities for the firm. This is frequently referred to as the expectation gap. We found that auditors recognized evaluating CEO’s comments as an important task but still shied away from spending much time on this, instead concentrating on less important tasks as evaluating last year’s financial results.

The two major components after rotation were interpreted as Future vs. Past orientation and Creative comprehension vs. Number crunching, (mechanical). The first principal component (the diagonal in Figure 6) can be seen as a combination of the two and can be labelled Difficult and important vs. Easy and not important. The expectation gap can then be represented as the upper right corner in Figure.7 STAKEHOLDER’s CORNER vs. the lower left corner AUDITORS CORNER.

The two opposite corners in Figure 6 seem to represent our basic dichotomy outlined in Figure 3 with the AUDITORS in the right non-constructivist part. In the field of audition this is usually referred to as Judgement vs. Structure, but the two poles apply to the whole field of regulation, and is similar to our basic dichotomy.

General discussion

The Australian social scientist John Braithwaite has devoted a major part of his career to critically discuss relying on standards vs. just relying on rules, see e.g. Braithwaite (2002). When Braithwaite et al. (2007) started to compare studies of Australian nursing homes with nursing homes in US, Braithwaite was at first almost embarrassed by toting Australian standards as “respect for integrity”, “providing homely atmosphere” etc. His American colleagues regarded this as thoroughly unscientific and pointed to their thick rule books. In our opinion Braithwaite’s further studies - which thoroughly documented that general standards led to far greater reliability than seemingly clear rules - is a strong argument for relying on discretion, and such et al. (2007) started to compare his studies of Australian nursing homes with nursing an approach may have a good home in a constructivist approach.

The reliance on rules seems endemic to much of US culture, Braithwaite (2002). Concerning “The three mile nuclear accident” (in the early seventies): “
Auditor grids

The Kemeny commission diagnosed the problem to be that the nuclear plant operators had been educated by the regulatory system to be rule following automatons. They had come to rely heavily on the rules for guidance to the neglect of systemic understanding of the complex safety problem that they were managing. They gave insufficient emphasis to principles."

In the wake of the above diagnosis Norwegian studies of simulating nuclear environment the operators – inspired by the philosopher Daniel Dennett - are encouraged to take an intentional stance – to regard the system as a complex, so to speak “living” organism .As a final example the rule thesaurus for economic analysts in the Federal bank encompass a tome of volumes while for Deutsche bank one volume is sufficient.

For further examples and documentation of the above points of view we strongly recommend the numerous studies by Braithwaite and his colleagues.

The relevance of this for auditors is distressingly clear. US have a dominating role in forging prescriptions for international regulations. Work in this area is going on for auditors and the tendency seems to be to lean more in the direction of rule books (Ohman personal communication, July 2011).

Relation to sociality

The processses underlying the contrasting corners in Figure 6 can be related to the sociality corollary (Tschudi and Rommetveit, 1982).

The auditors corner reminds us of looking at the company under scrutiny as a “behaving mechanism or object” thus epitomizing non-social relating. The stakeholders corner, however, is akin to Dennett’s “intentional stance”, where the company or factory is seen as a creature with outlook, and such a social stance “is the sort that builds a viable society” as Kelly states when discussing the sociality corollary.

Both and

In many concrete cases it would not be justified to simply think in terms of rules versus discretion. Especially in simple, clear cut cases rules may be sufficient, speed limits in traffic being one such example. In the case of social vs. non-social, there are similar examples where it is not necessary to construe the behaviour of the other at a high level, there is usually an optimal level, ranging from quite low when strangers meet, to the highest in intimate relations, (Tschudi & Rommetvedt, 1982) It is well known that the left part of the brain is heavily involved in concentrating on details while the right part is more concerned with total patterns. A balance is clearly desired but we wish to emphasize that current tendencies lean to much in the detailed rule based direction (left part of the brain).
Auditor grids

What can be done?

From a Kellian constructivist point of view the basic problem seems to be to that auditors and accountees so to speak live in different worlds and there is furthermore serious concern about "the decline and fall" of the auditor profession. Laws which try to ameliorate the current situation with adding large doses of new rules (Sarbanes Oxley law from 2002, does not seem promising, Jönsson, 2005)

How can one promote understanding – sociality – between the parties? In a fascinating "Foundation of a conversational science for psychology " Thomas and Harri-Augstein (1985) give extensive consideration to the use of grids in promoting mutual understanding. While their major examples deal with teacher – learner relations their book is relevant for different groups where "each often live in their own private worlds" (p.279).

A basic suggestion is to use EXCHANGE GRIDS. Here each party, say A and B provide her/his own grid, A may be an auditor, and B an investor. Relevant elements from the STAKEHOLDER’s CORNER, might be CEO’s comments, Environmental crime and Strategies, and from the AUDITOR’s CORNER, Attest routines, and Bad receivables. Highly relevant constructs for these elements would be: "Statements not valuable, statements very valuable for investor", "Easy to audit, difficult to audit", "Not oral info dependent, very oral info dependent" Additionally each party should suggest her/his own elements and constructs. When both A and B (say, an auditor and an investor) have filled out their own grids A then gives B her lists of elements and constructs (but not the grid ratings). B’s task is then to put himself in A’s shoes and figure out how she has filled out the grid. The situation is symmetric, B likewise fills in his own grid and hands A his lists of elements and constructs. It is then fairly straightforward to map out areas of agreement and of disagreement between A and B.

The basic point is then to facilitate an ensuing conversation which may further pave the way for each party to construe the world of the other. Needless to say, to promote sociality a friendly cooperative atmosphere will be essential. Special consideration should be given to the fact that for some auditors the situation may be threatening, and this ght lead to tightened constructions. It might be helpful if there are no clear status differences between A and B.

It may also be an advantage to have in mind other methods of cognitive mapping which can add to grids in order to facilitate a sharing of world views, (Eden et. al.. 1983, Novak 1993), and at best be a step in forming an epistemic community, Braithwaite and Drahos (2000).

Some auditors argued that task like CEO’s comments were better left to financial consultants. In our opinion, however, this is a group where many are more concerned with skimming the market and have little wish to enter a wider epistemic community.
Auditor grids

Concluding: We see creative use of constructivism much more important than just emphasizing a strict focus on rules. Our view of constructivism implies a feeling for the totality, how various actors best can complement each other. Borrowing a metaphor from music another way of stating our main point is:

We would not have great symphony orchestras if conductors focused only on keeping musicians from playing out of tune.
Audit grids

References


Auditor grids


Spearman structure

\[ r(i,j) = r(i,T) \times r(j,T) \]

Figure 1: Spearman structure relating manifest and latent levels/variables
Figure 2: Partial Least Squares (PLS)
Two-approaches

**Constructivist**
- Doing the Right Things
- Creative, future oriented
- Judgement
- Discretion, expert intuition
- Openness to gut level feelings
- Rules seen in light of principles and standards

**Non-constructivist**
- Doing Things Right
- Mechanical, past orientation
- Structure
- Formalization
- Disregard emotional signals
- Rules basic

Figure 3: Our basic dichotomy
**Figure 4:** PCA plot of correlations between grids for 76 Swedish auditors and mean grid (77)

**Figure 5:** PCA plot of correlations between 50 configurations from "TRUE" config. (52), also mean (51) included
Figure 6: Results based on Grid Plot from Ohman et al. (2006) European Accounting Review