Core Conflictual Relationship: Text Mining to Discover What and When

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Abstract

Following detailed presentation of the Core Conflictual Relationship Theme (CCRT), there is the objective of relevant methods for what has been described as verbalization and visualization of data. Such is also termed data mining and text mining, and knowledge discovery in data. The Correspondence Analysis methodology, also termed Geometric Data Analysis, is shown in a case study to be comprehensive and revealing. Quite innovative here is how the analysis process is structured. For both illustrative and revealing aspects of the case study here, relatively extensive dream reports are used. The dream reports are from an open source repository of dream reports, and the current study proposes a possible framework for the analysis of dream report narratives, and further, how such an analysis could be relevant within the psychotherapeutic context. This Geometric Data Analysis here confirms the validity of CCRT method.

Introduction

The CCRT method, i.e., the Core Conflictual Relationship Theme method, is based on the text analysis of the single narratives coming from an analytical setting. The Core Conflictual Relationship Theme is quite essential in psychotherapy. There are individual's relationships with his or her parents, and with other established personages, all of these relationships can and will be carried over into other relationships and also into other behavioural patterns. In Aylward (2012), terrible social violence is described and related to the perpetrator's youth and other relations and behaviours arising from that. Murtagh and Iurato (2016) also relate behaviours, self-development and socialization, with therapy. The related themes involved in these interpersonal relationships have been ascertained to be almost universal and commonly shared among all humans, and this is conferring objectivity to the attempts to identify them for instance either qualitatively via CCRT method and quantitatively via Geometric Data Analysis, as just we have done in this work. A similar methodology has been already performed in Murtagh and Iurato (2017).

A lot of what we are dealing with in this work is the quantitative (by Geometric Data Analysis) as well as qualitative (by CCRT approach) analytical methods. In the next section there is a description of CCRT and how it may quantify, using Geometric Data Analysis, various aspects of psychotherapy processes and procedures. In the section entitled *'Implementation and Objectives'*, there is outlining of the textual, hence

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descriptive, data used in this work. The analysis work starts in the section entitled *'Analytical Focus on Selected Names'*, with dream reports of views and relationships with parents, children, friends, brothers, and a person who had been a husband and after divorce, he died. That is general analytical processing. In the sections entitled *'Associating with a Named Individual'*, and *'Study of Mother*', there is a further mapping out of emotional relationships, described in the dream reports.

This approach enables a transposition of the concept of *transference*, that is, one of the chief notions of Freudian psychoanalysis, from the level of understanding, i.e., the epistemological key of human sciences methodology, to the level of explaining, i.e., the epistemological key of natural sciences. This can get the epistemological transformation of a concept of humanities into a concept of natural sciences, as it becomes liable to be measurable and assessable according to the usual methodology of the latter disciplines. Expressed alternatively, we relate both qualitative and quantitative analysis by integrating both Correspondence Analysis and CCRT method.

Core Conflictual Relationship Theme, and Data Mining Analysis

The CCRT method is based on the assumption that transference patterns are structurally rooted in every human being, moulded in infancy either by primary identifications with caregivers (usually, parents) and by innate factors, a pattern which is generally deemed as almost persistent as such in time, along the whole life's course of every human being, from which alternativeness (or otherness), i.e., the primary sense of the other, which goes beyond one's own individuality and self-love, arises, as well as almost the entire personality (Luborsky & Crits-Christoph, 1990, p. 18).

The CCRT method basically springs out from the observation of the recurrence of three main *leitmotivs* or themes during each analytical setting: what the patient wishes from others, how other persons accordingly react, and how the patient replies to these latter reactions. Therefore, Lester Luborsky (1920-2009), in the 1970s, identified the three main categories corresponding to these three recurrent themes, that is to say: the intentions, needs and desires toward another person, the corresponding responses of the other person, the consequent answers of the own Self. The final CCRT is to be given by the suitable combination of the most pervasive components present (and identified by means of Geometric Data Analysis) in each of these categories, retrieved from the various stories stemming from analytical setting.

The attention directed at these three main recurrent themes, is then supported by the previous psychoanalytic researches and studies which have shown that, in almost every human being, the fantasies are regrouped around some chief basic desires and the related intrapsychic conflicts. These fantasies take place early, since childhood, with their associated themes remaining the same for the whole life cycle, at most changing only their scene or the personages therein involved, just like in the CCRT (Luborsky, 1984; Luborsky & Crits-Christoph, 1990).

Resulting from all at issue here, there is the assumption that there exist deep and rooted unconscious fantasies which are almost universal and commonly shared by all human beings, outcomes of ancestral models of relationships deeply ingrained into human psyche which become active when one encounters the other. See above all, Laplanche (1985), by Jean Laplanche (1924-2012, associate of Jacques Lacan), who in

an interview (Laplanche, 1999, p. 36) states this: "primary symbolic identification, is not 'I identify myself' but an identification by the other. The other identifies me". Already in his early works, from 1912 Freud anticipated that recurrent thematic units were identified in the transference settings, made by dominant needs into reciprocal relationships established during childhood, along which these are taking, or not, a conflictual nature, and they are destined to be repeated again, during the next, whole life course, characterizing the related psychic development.

Luborsky considers a comprehensive set of other psychological studies which confirm, by analogy, his model, which historically sprung out from various, previous attempts to measure transference. From these, Luborsky and co-workers noted the occurrence of certain pervasive or recurrent themes during the analytical setting and related therefore with interactions between Self/Other. For these reasons, the method was named Core Conflictual Relationship Theme, as it has to do with central (i.e., Core) recurrent themes emerging from the various psychodynamic conflicts (i.e., Conflictual) established by the possible relations (i.e., Relationship) between the Self (patient in psychotherapy) and the Others (analyst, as well as other persons). Continuing from the CCRT method, an operative evaluation of transference phenomena has been then pursued (Luborsky & Crits-Christoph, 1990).

From the operational stance, the CCRT method starts with the identification of narrative units, said to be *relational episodes* (expressed as, RE), in which the patient is particularly involved in relationships with others (analyst, parents, friends, etc.) in a typical and primary manner, until putting into action the episode itself during the psychotherapy being undertaken. The RE should be described in a complete manner, above all in respect to the various situations related to the relations involved in such an RE. Once an RE has been identified, the next step is to identify, in a given RE, the various *thought units* composing such an RE, that is, the principal propositions present therein, hence the analyst proceeds with the identification of the major components of an RE, that is: wishes, desires, needs and intentions (W); responses of the others (RO); responses of the Self (RS), oneself. Afterwards, one proceeds to identify the various (implicit or explicit) meanings of the thought units, as, for example, the possible affective states involved there, as well as to classify all the possible responses of either the others (RO) and oneself (RS), classifying them as positive or negative, attended (i.e., not realized) or actuated (i.e., realized). Each of these items is then classified with a related score assigned by the examiner (supporting the therapist) who then should identify too the related recurrence (Luborsky & Crits-Christoph, 1990).

What is important in the compilation of CCRT, is the identification of the components W, RO and RS in each RE, to count these, to classify these as 'positive or negative' for RO and RS, as well as to classify RO as 'expressed in action or simply attended'. Hence, the examiner goes on to assign, to each component, a score in dependence on the frequency of its occurrence, in such a manner that, after this, one is able to describe what type of components (usually, of W type, but not limited only to this) are more frequent than others in the whole set of RE, with the principal aim to identify the final CCRT around which the main psychodynamic conflicts take place. Therefore, the final CCRT is provided by the most frequent themes of the type W, RO and RS as detected into the whole series of RE. As regards, then, W type themes, these should be previously determined in dependence on their degree of inference, which may be explicit (We) or more or less implicit (Wi), the latter being more frequent than the

former, hence much more important from a psychoanalytic standpoint for the latent meanings brought by them. For this, the examiner should identify as many as possible W type items, in that they are (as unsatisfied) the main centres around which revolve psychic conflicts. Much easier is the identification of RO and RS types, as they are usually expressed directly and are consequence of desires in that they are closely related to the satisfaction or not of desires and needs, or rather to their alleged satisfaction (whence, their classification as positive or negative). Finally, the themes of the components W, RO and RS are also classified in dependence on their intensity (Luborsky & Crits-Christoph, 1990).

The pivotal linking point between CCRT method and Freudian transference is just the parallel that should hold respectively between, on the one hand, the conflictual pair desires/needs/intentions (W) versus responses (RO/RS) and, on the other hand, the conflictual (Freudian) pair Es' pushes (impulses/drives/desires) versus Ego's responses (for example, as outcomes of the defence's mechanisms), and this congruence should need a validation on the basis of the assessment of CCRT method by therapeutic outcomes coming just from the clinical applications of CCRT method, which has shown that the components W, RO/RS have a high frequency of association and that such association has just a conflictual nature. So, having seen the high degree of objectivity of CCRT method, from this last result should follow that also Freudian transference should have or gain the same degree of objectivity if one were able to show the subsistence of the above crucial congruence between Freudian model of transference and CCRT method. The main aim of this article is how data mining analysis, such as the most coherent geometric data analysis and semantic mapping provided by Correspondence Analysis might bring aid or shed light to solve this last question or, at least, make more explicit such a fundamental link between Freudian transference model and CCRT method (Luborsky & Crits-Christoph, 1990).

Our Implementation and Objectives

The core analytical method used here is Correspondence Analysis, that is well expressed as Geometric Data Analysis (Le Roux & Rouanet, 2004). Our data to be analyzed can encompass qualitative, i.e., categorical, attributes as well as quantitative, and maps the data into a factor space that can be referred to as a latent semantic space. From display of data relationships, possibly proceeding to hierarchically cluster the data, and other interpretative tasks, our data analysis can be considered as inductive reasoning (Murtagh, 2017). The factor space can be generated from selected active variables, and then other variables are mapped into the factor space, where the latter are termed supplementary variables, and, in practical settings, the latter might well be contextual variables.

On account of the private or confidential nature of psychotherapy sessions, here we use the following data to explore the analytical processing and the potential for obtaining outcomes that will be relevant and important for the objectives described in the previous section (intentions, needs and desires towards another person, with the consequences and related responses). Used are much more data comprising dream reports where previous analysis carried out was in regard to individual relationships, Murtagh (2014a, 2014b). This data from Barbara (mostly written as Barb) Sanders is from DreamBank (2004), see also Domhoff (2003, 2006). Related analysis work on this textual expressing of dreams by this individual, Barb Sanders, is extensively covered in much of Domhoff (2003) and, in particular, in chapter 5. In chapter 4 (p.

99), the frequency of occurrence of naming pet animals leads to Barb Sanders being a "cat lover" rather than a "dog lover".

A point about our Correspondence Analysis methodology is that semantic similarity or identity is very supported through such terms being semantically mapped close to each other, or even potentially, superimposed in the factor space mapping. In Domhoff (2003), there is the noting that a cat lover may be using these terms: "cat", "kitten", "kitty", "kittie", "feline"; and a dog lover uses these terms: "dog", "doggy", "doggie", "puppy", "puppies", "canine". Opposite to this semantic commonality is supporting disambiguation, i.e., that identical or very similar spelling could be the case for quite distinct words, so their semantic mapping must have them distinct in the factor space. In Murtagh (2015) it is shown how misspellings are likely to be closely related in their locations in the factor space, and also singulars and plurals of words. The reason why lemmatization is not applied here (as it often is in the textual analytical processing, such as having the singular and plural of a noun being the one word, and such as having different "has", "will", etc., or "I", "you", "we", "they" verbal expressions all being the basic form of the verb) is that it may be the case that variations in such grammar can be revealing in its distinctiveness.

In Domhoff (2006, p. 1) there is the following description" "Dreams are dramatizations, or enactments, if you will, or our thoughts". Another quotation (p. 2) is: "She had several boyfriends after her divorce and never remarried". Born in the 1940s, she "did not start a dream journal until a few years after her divorce". There is description of the great importance for her of her mother, the importance also of her father, and how her "middle daughter", at 4.5 years of age, reacted to her divorce; then, "By contrast, Sanders dreams only half as often as her oldest and youngest daughters, who adjusted to the divorce better"; and there is description of the brother closest in age to her, and friends. Close friends include Ginny and Lucy. Discussion includes brother, Dwight, friend, Darryl.

In Domhoff and Schneider (2008), reference is made to the 22,000 dream reports available at DreamBank.net, of which 16,000 are in English. Characters in dreams are noted as being described by power laws (i.e., exponential distributions, and what is referred to as Zipf's law in information retrieval). Figure 1 relates to Barb Sanders. In analysis, used here are dream reports with the highest rank, in the dream contents, relating to the mother, then the father, then the oldest daughter, and next the following: middle daughter, youngest daughter, favourite brother, friend Ginny and friend Lucy. There is further discussion of religion, and sexual activity in dreams. A great deal more discussion is in regard to the substance and consistency of dreams. Also discussed are expressions of emotion from: "anger, apprehension, sadness, confusion, and happiness". Reference is also made (Domhoff & Schneider, 2008, p. 1244) to the appearance of these expressions in dream reports: "my dad" and "my mom". For Barb Sanders there is this (p. 1245): "Sander's rather perfunctory conversion to the Episcopal church when she married her husband, many years before she began to write down her dreams". It is stated in their conclusion that, for quantitative analysis, 125 or more dream reports are usually necessary.

Our objective is to map out what can be of central analytical importance using the Barbara Sanders dream reports. Note that the name Barb is more the case in the references (and in some of the dream texts, there is the self-reference by this

individual that just uses the letter, B). From DreamBank (2004), dream reports were obtained. In all there are 3116 dream reports available, from the years 1960 to 1997. Using a listing from DreamBank (2004) entitled *"The 'Cast of Characters' in the Barb Sanders Dream Series"*, that listed 125 names, each with their gender and their *'Relationship to Barb Sanders'*, the following names were selected here: Darryl, boyfriend; Derek, male friend; Dovre, daughter (oldest); Dwight, brother; Lucy, female friend; my father, father; my mother, mother; Paulina, daughter (youngest); Ellie, daughter (middle); Ginny, female friend (married to Ernie); Howard, ex-husband; Jake, brother. Our motivation for this selection was to have mother and father, ex-husband, all daughters (she had no sons); her brothers (her one sister was not included here), two friends (quite a few others not included), and a boyfriend (and eight others not included here). The ex-husband, Howard, died in 1997.

Taken for this analysis from the 1106 dream reports relating to the above listed names, were 421 of these. The 421 dream reports here are from index number 4, from 2 December 1960 to index number 1264, from 17 February 1989. Each dream report varies from a few words to about 900 words. In total, the 421 dream reports, in succession between 2 December 1960 to 17 February 1989 have 3789 words. Our aim here is to have a general approach for this analysis, and this can always be complemented with specific and derived procedures, such as using statistical modelling or machine learning, if tasks such as hypothesis testing or specific predictions are wanted. In the referenced Barb Sanders, *'Dreams and Waking Life: Interview Information ...'*, much information is included about her personal life and relations.

Analytical Focus on Selected Names

The data consists of frequency of occurrence values, encompassing presence or absence where the latter have frequency of occurrence values of 1 or 0. For the 421 dream reports, and the initial word corpus of 6376 words, we require each word to be used at least five times. That is so as to exclude exceptionally used words from consideration, and rather to have a requirement for some degree of commonality of word use. These result in a word corpus of 1568 words, for the 421 dream reports. The crossing (i.e., a frequency of occurrence matrix, including especially presence and absence values), of 421 dream reports by 1568 words, this has 37344 non-zero (i.e., non-absent) values, which is 5.66% of all values. Some of the dream reports thereby have their few words deleted, sixteen dream reports, so therefore our analysis on dream reports of sufficient length is to be on 405 dream reports, with frequencies of occurrence for the 1568 word set. From this word set, the selected names are to be main focus: mother, father, Ellie, Howard, Dwight, Paulina, Ginny, Dovre, Darryl, Lucy, Jake.

For the orientation of the analysis, or what we might term the focus of the analysis, these names are selected from the set of words. They constitute the active variables (i.e., selected words, cf. the brief description at the beginning of section 3), in the semantic mapping. Figure 1 displays the principal factor plane. The eigenvalues that express inertia of the factors, in percentage terms are: 11.8, 11.6, 11.3, 11.0, 10.7, 9.8, 9.6, 8.6, 8.1 and 7.7. In order to look further at the words expressing the dream content, just the dots represent the word locations in the principal factor plane, displayed in Figure 2. The changes over time are also to be looked at further, at the end of section 6 below, and these can also be simply displayed as in Figure 3. Here, as

follows, are the contributions by the selected names to inertia of the five factors. It is seen that factor 1 is most essentially relating to ex-husband Howard, and friends Ginny and Lucy. Factor 2 is most essentially relating to Ginny and Lucy. Factor 3 is most essentially relating to friend Ginny, daughter Ellie and ex-husband Howard. Factor 4 is essentially relating to daughters Dovre and Ellie, boyfriend Darryl and father. Finally here, as follows, factor 5 is essentially relating to Darryl and father.

Contributions of the selected names to the five factors:

	Dim 1	Dim 2	Dim 3	Dim 4	Dim 5
mother	0.4	0.3	1.7	7.0	2.7
father	0.5	0.1	1.8	16.2	23.3
Ellie	0.0	2.3	19.9	15.3	0.1
Howard	61.7	1.3	21.6	0.0	0.3
Dwight	2.3	0.2	0.1	1.7	0.0
Paulina	0.1	0.1	9.7	3.6	2.3
Ginny	16.7	27.6	37.5	2.9	1.5
Dovre	2.8	0.1	1.0	27.4	1.1
Darryl	0.2	0.9	0.5	19.3	68.2
Lucy	12.2	65.0	4.9	6.6	0.1
Jake	3.3	2.0	1.2	0.0	0.2

Here are the coordinates on the five factors of the selected names:

	Dim 1	Dim 2	Dim 3	Dim 4	Dim 5
mother	0.1	-0.1	-0.3	-0.6	-0.3
father	0.2	0.1	-0.3	-0.9	-1.0
Ellie	0.0	-0.4	-1.2	1.0	0.1
Howard	-2.3	0.3	1.3	0.1	-0.2
Dwight	0.4	-0.1	0.1	-0.4	0.0
Paulina	-0.1	-0.1	-1.0	0.6	0.5
Ginny	1.4	-1.8	2.0	0.6	0.4
Dovre	-0.7	-0.1	-0.4	2.0	0.4
Darryl	-0.2	0.4	-0.3	-1.9	3.5
Lucy	1.7	3.9	1.1	1.2	0.1
Jake	1.0	0.8	0.6	0.0	-0.2

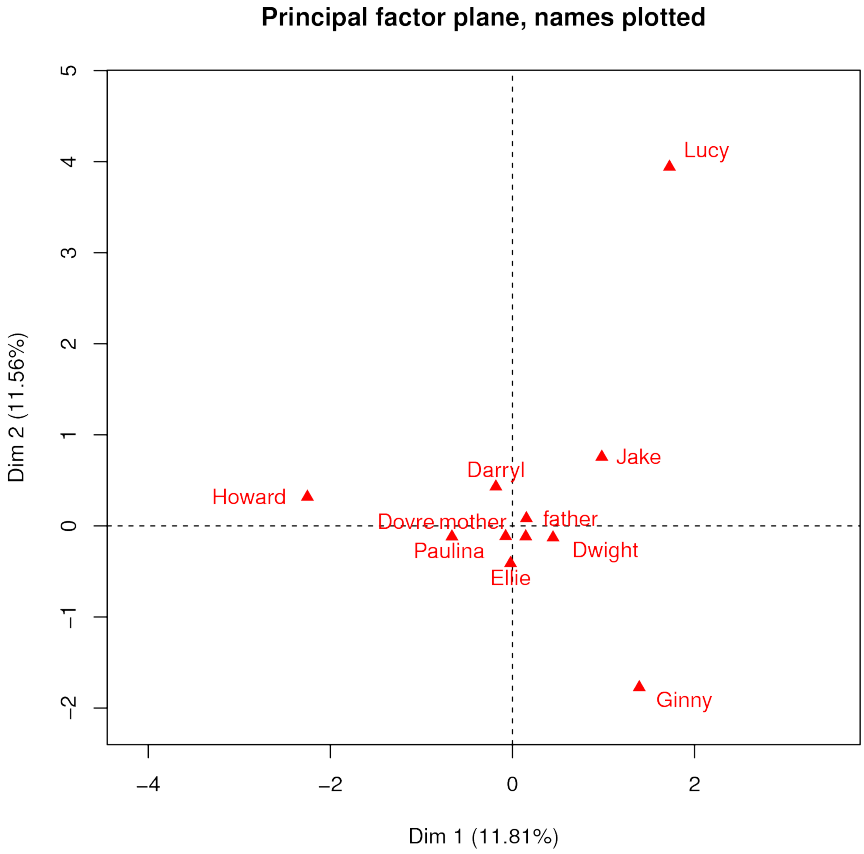

Figure 1

Factors 1 and 2, displaying just the names here. These are the active variables in the analysis.

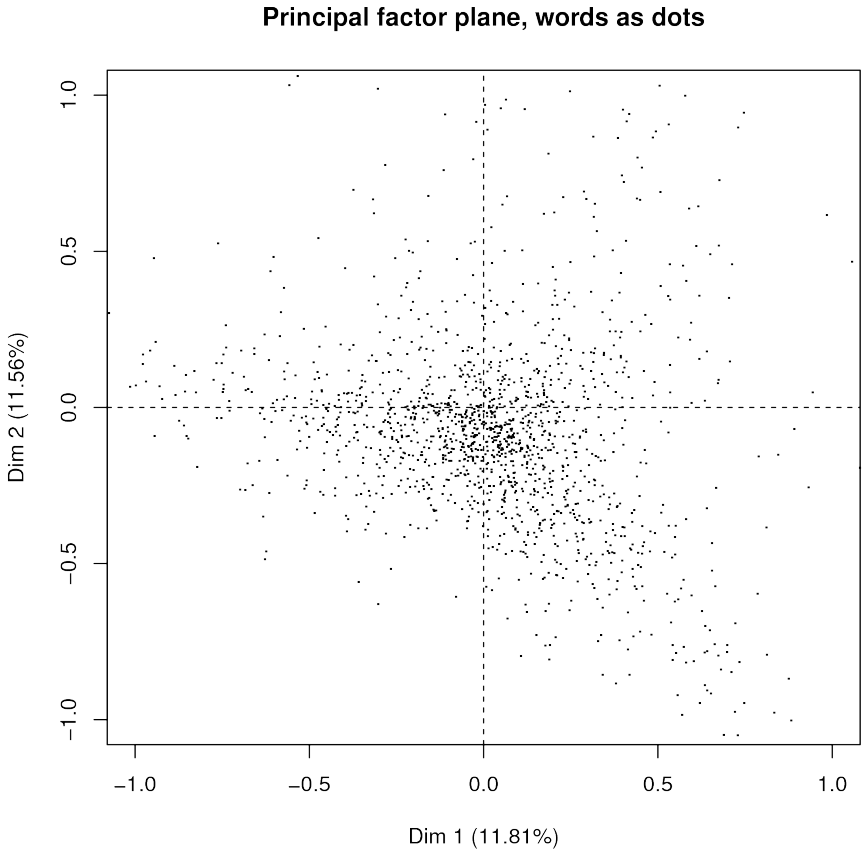

Figure 2

Displaying the 1557 words. Relative to Figure 1 and the scaling displayed for factors 1 and 2, i.e., the horizontal and vertical axes, here there is more concentration.

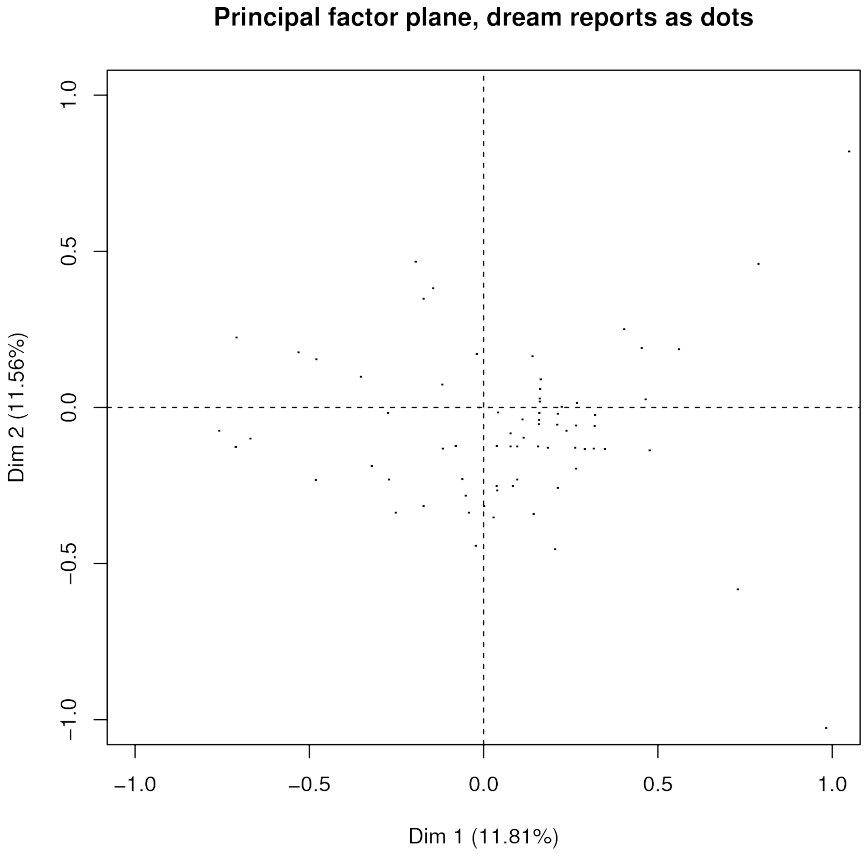

Figure 3

Displaying the 405 dream reports.

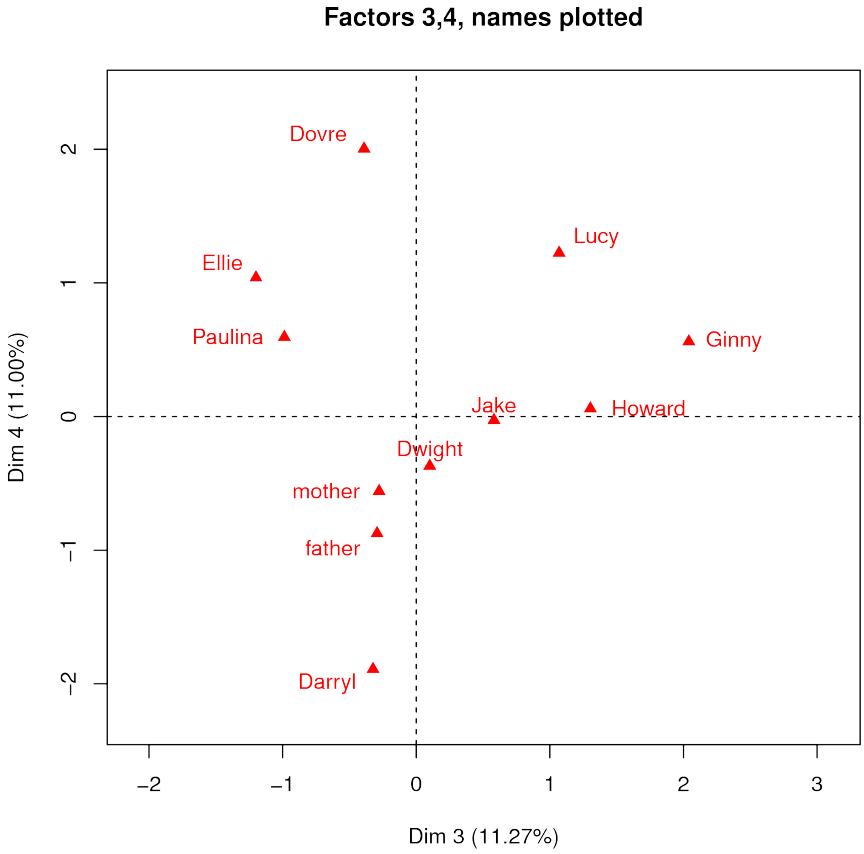

Figure 4

The names in the factor plane of factors 3 and 4.

Figure 4 shows the next factorial plane, the plane of factors, or principal component axes, 3 and 4.

Let us look now at what is most dominant for all of the factors. Since the active analysis is on eleven names, crossed in terms of frequency of occurrence (with 0 frequency of occurrence implying absence of this word in the dream report) with 405 dream reports. The supplementary variables are the 1557 other words here. We can term supplementary variables, like here, as contextual variables, i.e., providing the context for the names (the set of eleven names that are the active variables here). Active variables are, effectively, the primary focus of the analysis. Therefore the active, focussed analysis is for 405 dream reports crossed by 11 names; and the supplementary mapping is for the 405 dream reports crossed by the 1557 other word corpus members.

Here are the contributions by all eleven names to the entire set of factors.

	Dim 1	Dim 2	Dim 3	Dim 4	Dim 5	Dim 6	Dim 7	Dim 8	Dim 9	Dim 10
mother	0.4	0.3	1.7	7.0	2.7	0.0	0.0	0.1	18.6	50.9
father	0.5	0.1	1.8	16.2	23.3	0.0	16.7	0.6	15.2	8.5
Ellie	0.0	2.3	19.9	15.3	0.1	13.5	7.3	28.7	0.2	1.0
Howard	61.7	1.3	21.6	0.0	0.3	2.0	2.3	0.0	0.1	0.1
Dwight	2.3	0.2	0.1	1.7	0.0	6.8	8.5	1.6	32.7	36.2
Paulina	0.1	0.1	9.7	3.6	2.3	2.9	1.6	64.5	6.8	0.0
Ginny	16.7	27.6	37.5	2.9	1.5	3.3	1.5	0.0	1.4	0.1
Dovre	2.8	0.1	1.0	27.4	1.1	34.8	26.4	0.2	0.6	0.1
Darryl	0.2	0.9	0.5	19.3	68.2	0.0	2.1	2.8	1.5	0.0
Lucy	12.2	65.0	4.9	6.6	0.1	5.7	1.2	0.0	0.7	0.0
Jake	3.3	2.0	1.2	0.0	0.2	31.0	32.3	1.5	22.4	3.0

Briefly, we see that factor 1 is predominantly related to Howard; factor 2 is predominantly related to Lucy; factor 5 is predominantly related to Darryl; factor 8 is predominantly related to Paulina; and factor 10 is predominantly related to mother.

We can seek to find the association and relevant informative relationships, as displayed for Factors 1 and 2 in Figures 5 and 6. Figure 5 displays this for the ten most contributing (to inertia of the factors, i.e., the axes) dream reports. Regarding the mapped locations of these dream reports, it can be good to see what names are at issue, and these are displayed in Figure 1; and it can be checked as to how relevant other, less contributing to the factors, dream reports might be, as displayed in Figure 3 for the mapping of all dream reports here. Figure 6 displays the ten words from the word corpus derived from the data, with the highest squared cosines, and thereby what is in effect the correlations with the axes. Figure 6, as a display with the selected ten most important words, is more useful to interpret, compared to Figure 2, with all of these words mapped into the same factor 1 and factor 2 plane. From Figures 5 and 6, there may be help for interpretation or discovery of some associations, and the following can be noted: first, by having such displays of highest contributing dream reports or, in effect, highest correlation words, this will help to have the displays, in the figures here, not having superimposed labels of dream reports, or words. Also, from such displays, this may lead to perspectives on what or where to have more detailed inspection, or also even reading the original dream reports. After all, here at issue might well be therapeutic practical perspectives, and expressed in a very general manner, cognition or inductive reasoning.

We may note that in Figures 5 and 6, and Figure 1 and Figures 2 and 3, these are the factors 1 and 2 planar representation and they are related to, respectively for factors 1 and 2, 11.81% and 11.56% of the overall information content. Examing the most important factors can be informative and revealing. Of course, also, a visual display as in these figures, is best when planar, i.e., two-dimensional. Figures 5 and 6 provide some potential interpretation when compared, respectively, to Figures 3 and 2. It can be the case, that rather than the selection of ten mapped entitities in Figures 5 and 6, we may try twenty or even more, but we may well find that the labels used become superimposed in the display because there are a lot of them, mapped quite close to each other. In the section to follow, at issue will be some study based on the full dimensional factor space, and therefore, with the full information content of the data.

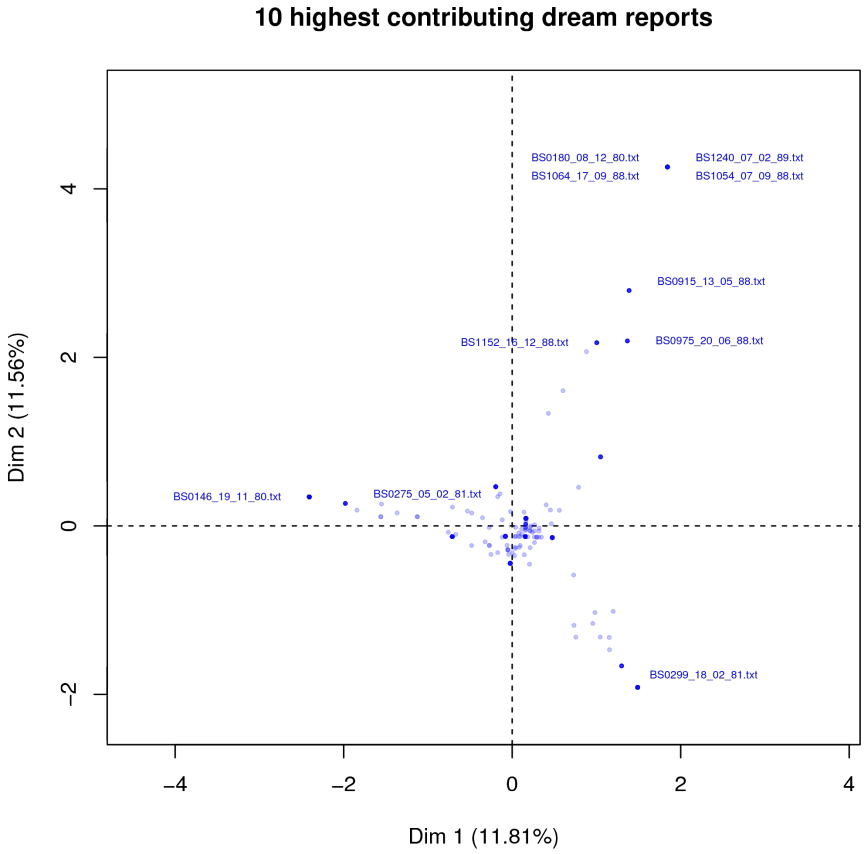

Figure 5

The ten highest contributing (to the inertia of factors 1 and 2) dream reports in the factor 1, factor 2 space. These names have the letters BS, then a sequence number, and then the data (with format: day, month, last two digits of the year).

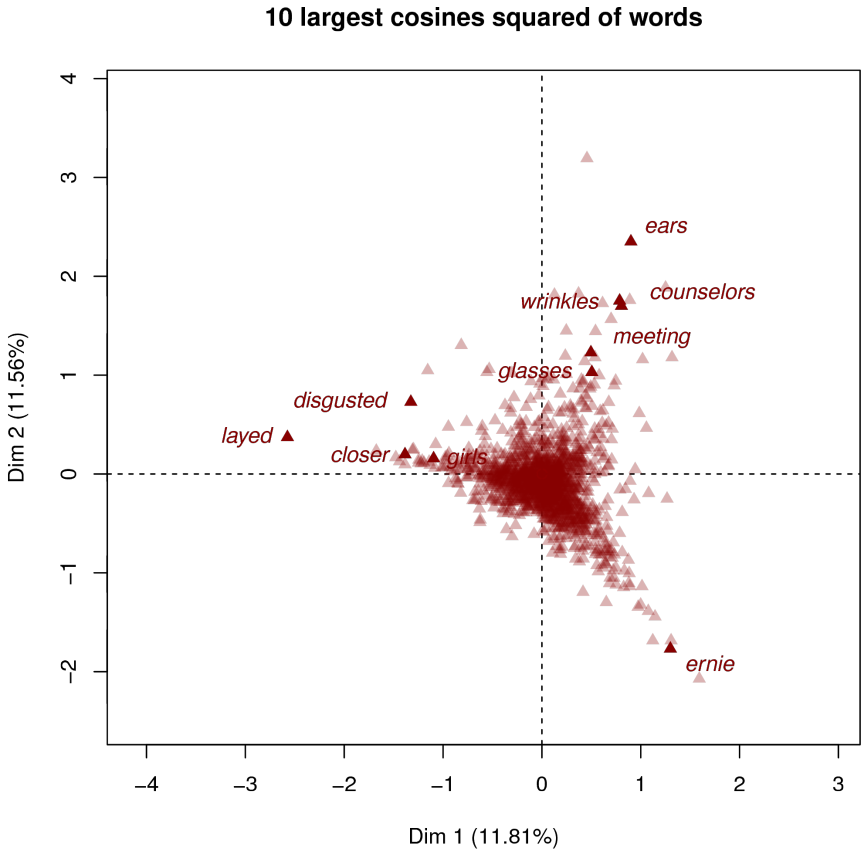

Figure 6

The ten highest contributing words from the word corpus (in this analysis, taken as supplementary variables, relative to the active variables comprising the eleven names).

Associating with a Named Individual: Verbal Expression – What and When

While referring to verbal expression, this can and will be always put into text, through being digitally recorded or digitally stored. Verbal expressions here are single words, members of the word corpus that is derived from the set of texts that comprise the data under analysis. As noted above, semantic proximity or near identity is well handled. Semantics here is the entirety of relationships: for words, what dream reports they are in; for dream reports, what words they have; yielding here the factor space mapping of word interrelationships, dream report interrelationships, and the combined and contrasted interrelationships of all.

We seek here to derive the most salient, the most informative and the most revealing expressions relating to the selected set of individuals. Again it is noted that these eleven individual names are: “mother”, “father”, “Ellie”, “Howard”, “Dwight”, “Paulina”, “Ginny”, “Dovre”, “Darryl”, “Lucy”, “Jake”. Section 3 explained these individuals, as follows. The third onwards here are: daughter, ex husband, brother, daughter, friend, daughter, boyfriend, friend, and brother. We select the ten semantically closest words to the name. These are closest to the name but clearly they can possibly be used also with other names. So for each of the words, we seek the use of the word for that name; and list the dream record dates when they are being used.

That will allow us, firstly, to determine what are the most associated words relating to dream reporting for that name. Secondly, the pattern of word use over time can be followed. To some extent, this may help to know if such patterns in word usage can be associated with emotional expressions, or the nature of the relationship with the individual of that name.

For the processing carried out, all words have their upper case letters set here to lower case. The distances, between each of these words and the name, are shown in order to quantify the ranking of their semantic importance for the name. Note that such calculations are carried out in the full dimensional factor space. The dream report dates are to consider any variation over time. (For general interest, a statistical hypothesis test was carried out of the distances, overall, being of normal distribution. This was tested for the unique distances, i.e., for the dream reports, 81,810 distances; for the eleven names, 55 distances; and for the supplementary columns that comprised the word corpus, 1,211,346 distances. Also tested were all unique distances here, i.e., 194,626,585 distances. The mean distances, respectively, are, in two decimal places of precision: 3.91, 4.67, 1.70 and 0.56. The Shapiro-Wilks test of normal distribution gave a p-value in all cases of 2.2e-16. That being near zero means that the distances are not of normal distribution. This is not surprising, since an enormous number of values, like these here, are likely to follow an exponential distribution.)

Name: mother

The ten closest words in the semantic, full-dimensional factor space, with their distances, here rounded to two decimal places, are:

```
doors sleepy stood nose nurse invisible clearly
 0.54  0.43  0.48  0.49  0.53  0.53       0.46
engagement king mid
 0.53      0.53 0.53
```

The number of dream report texts with this name, from the 405 dream reports, is 108. In fact, 24 of the dream reports contain one or more of the ten semantically closest words.

Name: father

```
paul counter shoe tom hardly josh harrison bricks
0.28   0.61  0.76 0.45 0.75  0.47   0.80    0.76
salesman ship
 0.80   0.48
```

The number of dream report texts with this name, from the 405 dream reports, is 85. In fact, 39 of the dream reports contain one or more of the ten semantically closest words.

Name: Ellie, daughter

Although ten closest words are at issue, here there is one distance repeated so this leads to eleven closest words at issue here.

```
tyler hers kathleen jungle reluctantly beads cereal scarf
0.61  0.64   1.04    0.71    1.18      0.81   1.21   1.08
snuck scream captain
 1.21  0.88    0.67
```

The number of dream report texts with this name, from the 405 dream reports, is 55. In fact, 23 of the dream reports contain one or more of the ten semantically closest words.

Name: Howard, ex-husband

```
closer trapped relieved disgusted wanting forward layed
1.25    1.31    1.50     1.10      1.51    1.44    0.47
accidentally please bob
1.16         1.42  1.43
```

The number of dream report texts with this name, from the 405 dream reports, is 61. In fact, 24 of the dream reports contain one or more of the ten semantically closest words.

Name: Dwight, brother

```
brother teach beat teaching bartender monkey xmas plate
 1.21   1.19  1.05  1.21     1.10      0.94  1.02 0.60
surgery marry
 1.02   1.02
```

The number of dream report texts with this name, from the 405 dream reports, is 53. In fact, 39 of the dream reports contain one or more of the ten semantically closest words.

Name: Paulina, youngest daughter

```
fletcher mad listening manager journey  rope  catches
 0.76   1.03   1.33     0.63    1.29    0.91   0.76
cross branch button
1.08   0.46   0.75
```

The number of dream report texts with this name, from the 405 dream reports, is 49. In fact, 23 of the dream reports contain one or more of the ten semantically closest words.

Name: Ginny, friend, female

```
ball disabled ernie raul repair deaf signs actors shore
1.54   1.51   0.37  0.90  1.13  0.98 1.48  0.57   1.25
diane
 0.67
```

The number of dream report texts with this name, from the 405 dream reports, is 35. In fact, 18 of the dream reports contain one or more of the ten semantically closest words.

Name: Dovre, oldest daughter

```
air gathering opened kittens rail spanish interest esther 1.92   1.75
1.61    1.96  1.36  2.03    1.99     1.90
works chute
1.71  1.67
```

The number of dream report texts with this name, from the 405 dream reports, is 37. In fact, 17 of the dream reports contain one or more of the ten semantically closest words.

Name: Darryl, boyfriend

```
train course bleachers dive hidden arthur easy supportive
 2.45  0.85    2.00    2.21  2.21   0.60  2.49    1.47
numbers tracks
 1.12    1.84
```

The number of dream report texts with this name, from the 405 dream reports, is 21. In fact, 8 of the dream reports contain one or more of the ten semantically closest words.

Name: Lucy, friend (female)

```
boyfriend song offers andrea leader ears rehearsal
  3.10    3.13  2.94   2.61   1.54  2.22   2.96
wrinkles counselors elizabeth
2.68       2.78       3.11
```

The number of dream report texts with this name, from the 405 dream reports, is 22. In fact, 9 of the dream reports contain one or more of the ten semantically closest words.

Name: Jake, brother

```
shower age valerie parade shampoo  ex  fur program
 2.75  2.83  2.02   2.65   1.60   2.39 1.83  2.35
meaning curls
2.84   2.85
```

The number of dream report texts with this name, from the 405 dream reports, is 15. In fact, 11 of the dream reports contain one or more of the ten semantically closest words.

For name “mother”, the succession of dream report texts

The name “mother” is in 108 dream reports. As noted above, just 24 of these dream reports contain one or more of the ten semantically closest words, in an overall sense. These words here, for this name, “mother”, are: “doors”, “sleepy”, “stood”, “nose”, “nurse”, “invisible”, “clearly”, “engagement”, “king”, and “mid”. These were determined as the closest words to “mother”, from our word corpus other than the 11 names, consisting of 1557 words.

The following lists the dream report, by its stated sequence number, followed by the day, month and last two digits of the year. (Note that the first date here, is as stated on the original data. I.e., day and month are unspecified, and the year is 1977). Then the values, 0 and otherwise, these are the number of occurrences, including non-occurrence = 0, of the word in the dream report.

Seq. no.	Day-month-year	Ten semantically closest words to "mother"								
		doors	sleepy	stood	nose	nurse	invisible	clearly	engagement	king
mid										
0052	xx_xx_77	0	0	4	0	5	0	0	0	0
0										
0107	29_09_80	0	1	0	0	0	0	0	0	0
0										
0129	08_11_80	0	0	0	1	0	0	0	0	0
0										
0243	19_01_81	0	1	0	0	0	0	0	0	0
0										
0269	01_02_81	5	0	0	0	0	0	0	0	0
0										
0288	14_02_81	0	3	0	0	0	0	1	0	0
0										
0322	27_02_81	2	0	0	0	0	0	0	1	3
0										
0339	07_03_81	0	0	0	0	0	1	0	0	0
2										
0348	12_03_81	0	0	0	1	0	0	0	0	0
0										
0370	23_03_81	0	1	0	0	0	0	0	0	0
0										
0376	27_03_81	0	0	0	0	0	3	0	0	0
0										
0412	17_04_81	1	0	0	0	0	0	0	0	0
0										
0440	05_05_81	0	0	0	0	0	0	0	1	0
0										
0442	06_05_81	0	0	0	1	0	0	0	0	0
0										
0497	14_10_82	0	0	1	0	0	0	1	0	0
0										
0507	01_11_82	0	0	0	1	0	0	0	0	0
0										
0576	21_10_84	0	0	0	0	0	0	1	0	0
0										
0715	15_03_85	0	0	0	0	0	0	0	0	1
0										
0843	22_09_86	0	0	0	0	0	0	0	0	0
1										
0920	17_05_88	0	0	0	0	0	0	1	0	0
0										
0946	03_06_88	1	0	0	0	0	0	0	0	0
0										
1020	21_07_88	0	1	0	0	0	0	0	2	0
0										
1081	25_10_88	0	0	0	0	0	0	0	0	0
1										
1262	16_02_89	0	0	0	2	0	0	0	0	0
0										

While there is not a great deal of presence of words here, nonetheless it may be relevant in practice to avail of the relatively general expressions. Some words could become useful to seek trends with. Here the word "nurse" was only used early in this context. Words such as "doors", "sleepy" recur. All in all, this analysis is based on very general and overall context. Hence the most general objective is to check out the balance of all that is relevant, to map out some of the most salient issues, and pursue general issues and themes.

Study of Mother

We take the 108 dream reports relating to the name "mother", that had, initially, a word corpus of 1568 words. The number of non-zero frequency of occurrence values was 6.27%. Some of these words, collected from all of the dream reports under consideration here, had not got entries in dream reports relating to "mother". That reduced the number of words to 1433. To have relevance, words that were at least occurring five times or more were determined and, so, the analysis is to be carried out on the 108 dream reports, relating to the word "mother", and with frequencies of occurrence for 662 words.

The Correspondence Analysis, with the full dimensionality of the semantic, factor space being 107, the cumulative percentages of inertia for the initial factors are: 3.27, 5.33, 7.31, 9.25, 11.13, 12.99,14.81, 16.59, 18.32, 20.05, and so on. In Figure 7, on the positive half axis of factor 1, there are these words: "were", "looked", "said", "was", "felt". Near the origin there it the word "he". For factor 2, on the positive half axis, there are the words "tea", "cup", and on the negative half axis, there are the words "paul" and "guy".

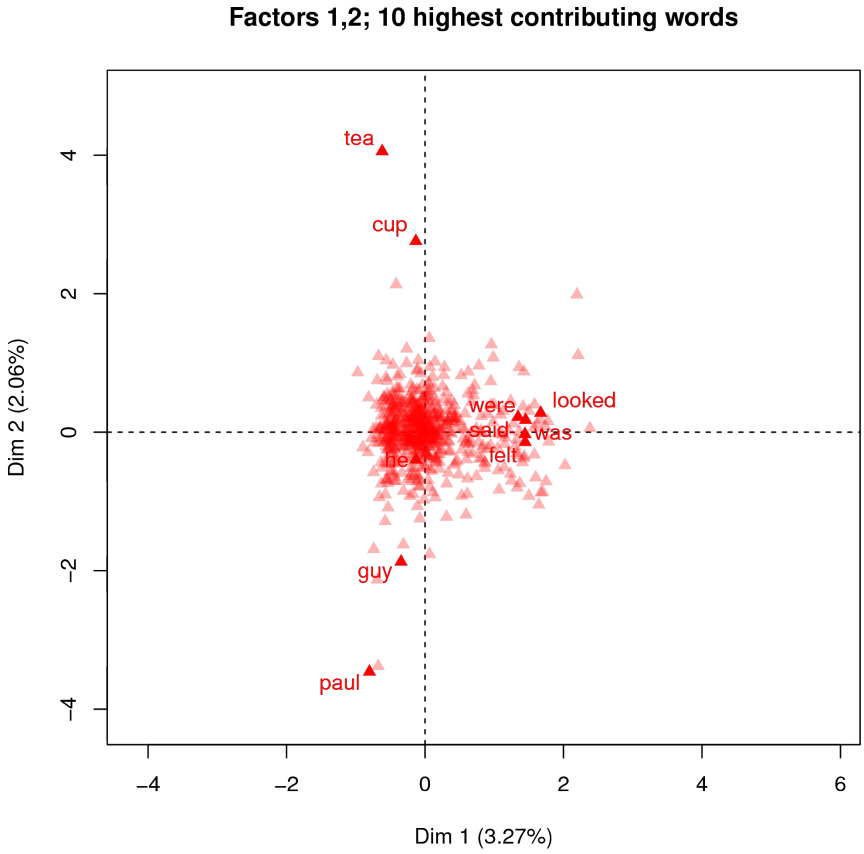

Figure 7

The ten highest contributing words are displayed in the principal factor plane.

Figure 8 displays the 14 highest contributing words for factors 3 and 4. Near the origin, on the positive side of factor 4, “they”, “one”; and on the negative side of factor 4, “me”. For factor 3, on the positive side, “edge”, “xxx” (a word used in quite a few of the dream reports), “pickup”, “parking”, “park”, and the latter three are negative on factor 4. The lower left quadrant has “ellie”, “nate”, “cards”, “abner”. The upper right quadrant has “nurse”, “child”. Just for information about these words, all upper cases have been put to lower case, in the analysis, and this expression is in this dream report (identifier number 0038, with the date, 23 September 1976), “cousin Abner or Nate”.

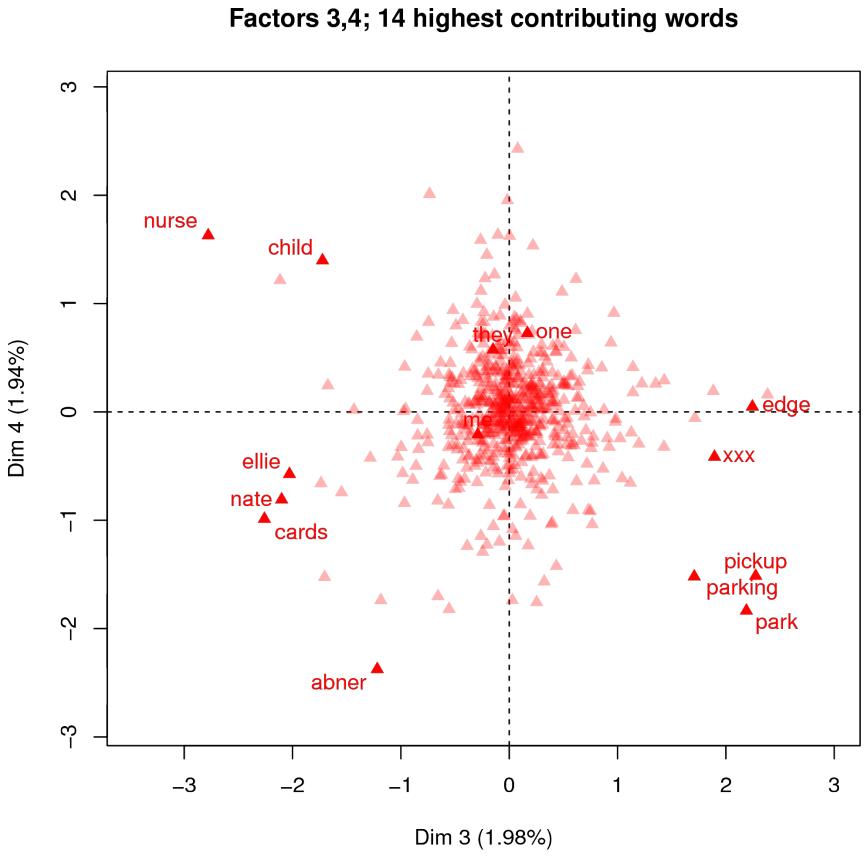

Figure 8

The fourteen highest contributing words are displayed in the factor plane of factors 3 and 4.

Figure 9 displays the principal factor plane with the highest contributing dream reports. The labelling is the letter “BS”, then the sequence number of the dream report, followed then by its date, expressed as day, month and final two digits of the year.

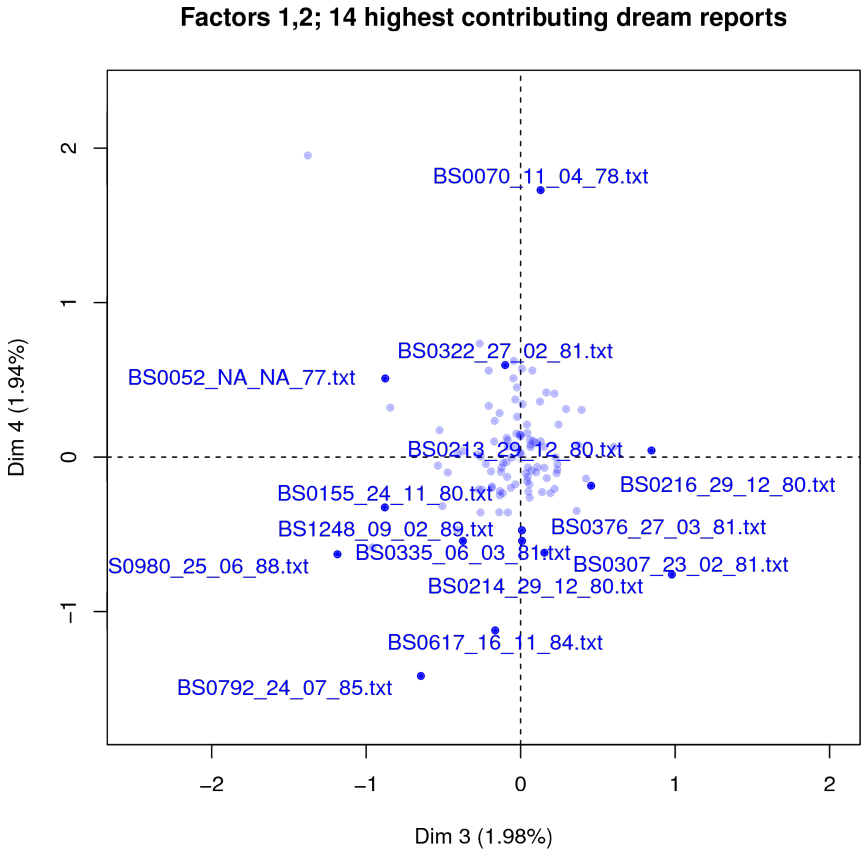

Figure 9

The fourteen highest contributing dream reports are displayed in the principal factor plane.

Hierarchical clustering of the dream reports, subject to their sequencing, which is chronological, this is displayed in Figure 10. For CCRT relevance, the role here of the hierarchical clustering is to have an overall framework for evolution over time. This is a manner of displaying similarity and stability versus differences and changes over time, in the therapy or general narrative. In this paper, for the dream reports that are the subject of the analysis here, the dream reports were selected using presence of the personal names. If it were the case of all dream reports, then such a hierarchical clustering would display well the overall narrative evolution. In Murtagh (2017) there is discussion of, and references to, such chronological hierarchical clustering studies of film scripts for movies, and of forensic speeches in court cases. Beyond what is now discussed, regarding Figure 10, it can be relevant to segment the narrative by deriving a partition from the hierarchy, hence clusters that are chronologically sequenced.

A very interesting aspect of the dendrogram (i.e., hierarchy) here is how different the first dream report is from the 2nd to the 39th. Then comes a very major discontinuity, for the 42nd. The preceding and the following dream reports, relative to the 42nd are (showing sequence number and day, month, year): 0392, 05_04_81; 0402, 11_04_81; 0408, 15_04_81. The 40th dream report is very limited in its small number of words:

"Somebody wore her mother's wedding gown". The previous dream report has 40 words and the one after it has 282 words. Sometimes successive dream reports are for the same date, but not here. Again to note that for CCRT relevance, the role of hierarchical clustering could well be to analyze the narratives in the successive therapy sessions, or pattern of evolution over time.

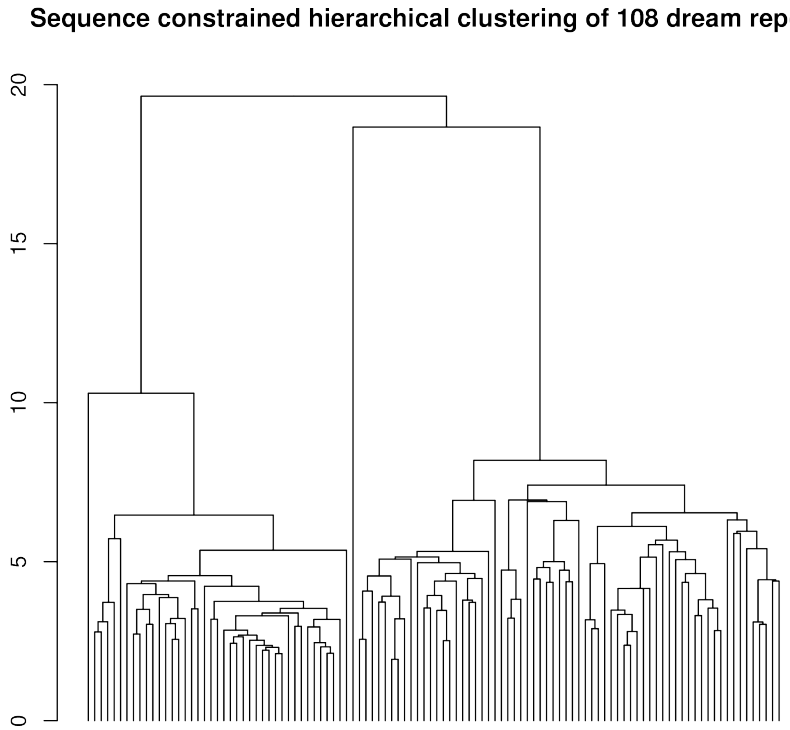

Figure 10

Hierarchical clustering of the 108 dream reports, using the full dimensional factor space, and having the chronological constraint.

Conclusion

In this paper, we seek to transpose Freudian transference to the level of explaining, and the level, or extent, of understanding and hermeneutics results from the objectifying approach used, arising from the data sources. Here, the proposed objectifying approach can support qualitative research that, for example, interprets certain important dreams as derived from statistical analysis. Our proposed approach is to be very useful for (i) analytical research, and potentially (ii) therapeutical practice. In section 2, mentioned was what may be "almost universal and commonly shared", such as every child's relationship with mother, father and then siblings. For both science and therapy it would be interesting to identify relatively stable and relatively shared patterns over a large population. One small point in regard to future research is to further study the issue of conflictual relationships, and how this is expressed, in a revealing (discovery) way and in an informative (predictive) manner, in the interpretation of the findings. For therapeutical practice, while this paper is quite

theoretical, and using dream reports, two outcomes can be emphasized: firstly, how quantitative as well as qualitative assessment and evaluation can be carried out; secondly, names and relationships can be what are best to be selected, for the analytical focus. In Cariola (2011), there is hierarchical clustering for analysis in dream narratives of selected words that linguistically express emotion, and sensory and perceptual characteristics.

A traditional approach to addressing issues such as a CCRT theme would be the use of questionnaire-based surveying. This could well include both scale-based question responses and also free-text responses. But better methodology, along the lines of all that is in this paper, is to use narratives and accounting for a patient's or anyone's behavioural practices, and, quite possibly also, for mental health. While very much that is involved in the data here is categorical, also termed qualitative data, then mapping into the factor space, that fully takes care of semantics, in effect is quantifying or quantification of our data.

In this paper, there was demonstration of determining the most relevant words, or derived terms, in the text source for analysis. The focus of the analysis, and studying balance and dominance of the data's contents, and very possibly, contextual description, all are at issue here. Certain words or terms may be of importance, for example because they may express underpinning emotions (hence related with responses of the type W, in agreement with CCRTs), but also the semantics, that are at issue in this article, these may be very helpful in their application in a general context. Also it was noted how hierarchical clustering very well displays continuity or major change in the chronology of the narrative. Once the input data has been well formatted for the analysis to be carried out on it, all that has been used in this paper has been computational efficient and, we may note, all was implemented and used in the R software environment.

The final conclusion is to note the potentially great benefit, relevance and importance of such analytics fitting CCRT method with Geometric Data Analysis which have shown that, from clustering semantics coming from the analysis of the various factor spaces, REs are centred just around responses of the type W, as well as of the type RO and RS, if one takes into account the social group of persons considered and investigated in the text and drawn from the Barbara Sanders archive.

Future research can include the possibilities for analyzing dream reports of a series of respondents; and that may provide important contributions to issues such as the collective unconscious, and sociological research on "structural psychology" (expressed by Pierre Bourdieu, see also Murtagh & Iurato, 2017, p. 28). For possible applications in therapeutical contexts, in the long run, such analyses may be quite instructive for practical issues, as follows: patients could be assigned to already established, stable classes and their treatment might become more efficient. A final point to make is that in psychotherapy, dream reports, as such, possibly could be relevant and important, in particular in how such dream reports might change in the course of pyschotherapy, and hence represent, to some extent, unconscious processes and associations.

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