The socio-cultural conceptualisation of FEMININITY
Corpus evidence for Cognitive Models

Abstract
This study examines the possibility of extending Multifactorial Usage-Feature Analysis (Profile-Based Approach) to describe abstract conceptual structures such as those identified in Idealised Cognitive Model (ICM) research. The approach is argued to resolve two methodological limitations with the analytical framework of ICM. These limitations can be described as (i) a lack of means for identifying social variation in the structure posited and (ii) a lack of means for falsifying the structures identified with the framework. Multifactorial Usage-Feature Analysis is corpus-driven and quantified, permitting a multidimensional picture of the models that accounts for social variation as well as falsification through repeat analysis. The study focuses on the concept of FEMININITY. Instead of limiting the analysis to metaphoric structure, it takes a keyword lexical approach. The data are synchronic and restricted to a specific genre / register of American English.

Keywords
Idealised Cognitive Models, Multifactorial Usage-Feature Analysis (Behavioural Profile Approach), corpus linguistics, Cognitive Linguistics, FEMININITY

1. Introduction: Usage-Based Cognitive Models and FEMININITY

The Idealised Cognitive Model, first proposed by Lakoff (1987), has been systematically demonstrated to be a powerful and versatile tool for the description of conceptual structure as encoded in language. However, two fundamental concerns regarding its empirical reliability remain to be considered. Firstly, the very nature of the models are ‘idealised’. This means that they are extremely abstract generalisations that offer no information as to socio-cultural variation. In other words, each language community, or culture, is treated as a single block, with the caveat that not every individual shares all the facets of a single Cognitive Model. It is for this reason they are termed “idealised”. Since Cognitive Linguistics assumes a usage-based model of language, variation is held to be basic to language structure, and therefore in turn, culture. Current methods for the identification of cognitive models omit
any possibility for capturing such variation. Moreover, and perhaps more importantly, this very point makes the falsification of the models extremely difficult. Since counter evidence observed may represent variation in the language community, it is not possible to disprove the proposal of any given model. Methodologically, this is a serious weakness that brings into question the value of the results obtained using this framework.

This study seeks to amend this situation by proposing a method of analysis that will integrate social variation into its results and permit the falsification of those results. Extending Multifactorial Usage-Feature Analysis to Cognitive Models has been attempted before. Glynn (2007, 2014e, Glynn 2014f), Sten & Glynn (2011), Nordmark & Glynn (2012) and Krawczak (2014b; 2014c; this volume) all represent attempts at extending the method in this manner. However, these previous studies, with the exception of Sten & Glynn (2011) and Glynn (2014e) restricted themselves to emotion concepts where the rich metaphoric structure was the focus of attention. Sten & Glynn (2011) and Glynn (2014e) apply the method to an abstract concept where metaphoric structuring is less important, like with FEMININITY, but these studies restrict the analysis to a single lexeme. This study attempts to apply the method to non-metaphoric language across a set of near-synonyms, or keywords.

The concept of FEMININITY is obviously a socially pertinent concept. In cultural studies, critical discourse analysis just as in sociology and social anthropology, the conceptualisation and representation of gender is a cornerstone of research. Moreover, growing research in cross-cultural pragmatics (Blum-Kulka et al. 1989, Wierzbicka 1991) and corpus-based Pragmatics will be directly informed by the successful application of Multifactorial Usage-Feature analysis to this concept. Although the current study is effectively a proof-of-principle study, the results represent an advancement in the quantitative description of socio-culturally sensitive concepts using corpus data.

2. Method and data

2.1. Multifactorial Usage-Feature Analysis and Key Word Analysis

The investigation employs Multifactorial Usage-Feature Analysis or the Profile-Based Approach (Dirven et al. 1982; Geeraerts et al. 1994; Gries 2003). This methodology was developed amid early research in Cognitive
Linguistics designed to permit corpus-driven quantitative analysis of purely semantic phenomena. Moreover, computational linguistics has recently adopted the method. In Computational linguistics, it is termed Sentiment Analysis or Opinion Mining (Wiebe et al.). The method is straightforward and is based on qualitative analysis (manual annotation) of large numbers of contextualised occurrences of a given linguistic phenomenon. These occurrences take the form of a sample extracted from a corpus, either based on a formal string (semasiological) or on a manually identified linguistic function or concept (onomasiological analysis). The analysis / manual annotation is a systemic application of a set of pre-determined conceptual-functional categories or usage-features to each of the occurrences / examples. The occurrences are each tagged (annotated) for these features. This produces a large set of "meta-data" concerning the use, or behaviour, of the linguistic phenomenon under investigation. For a more detailed description of the method and its strengths and weaknesses, see Glynn (2010b; 2014b; 2014c). Within Cognitive Linguistics, a few examples of its use would include Dirven et al. (1982), Geeraerts et al. (1994), Gries (1999; 2006), Divjak (2006; 2010), Divjak & Gries (2006), Gries & Divjak (2009), Glynn (2007; 2008; 2009; 2010a; 2014a), Janda & Solovyev (2009), Krawczak & Glynn (2011), Krawczak & Kokorniak (2012), and Krawczak (2014a). There are also three edited volumes devoted, in part, to developing the method, Gries & Stefanowitsch (2006), Glynn & Fischer (2010), Glynn & Robinson (2014).

In Cognitive Linguistics, keyword analysis is used to operationalise the study of conceptual structure (Wierzbicka 1985; Kövecses 1986; Lakoff 1987; Vorkachev 2007; Bartmiński 2009). This method assumes that the lexical semantics of representative ‘keywords’ can be employed as an index of the language community’s conceptual structure. The method can be adopted mutatis mutandis and integrated into Multifactorial Usage-Feature Analysis. The principle is simple: take the keywords traditionalised analysed as abstract lexical categories using introspection and use them as keywords in the retrieval of natural usage examples in corpora. In this way, combining Wierzbicka-style keyword analysis and Multifactorial Usage-Feature Analysis is straightforward.
2.2 Lexemes and corpus sample

In this study, the choice of keywords was operationalised in terms of frequency. An exhaustive list of adjectives denoting FEMININE were taken from thesauri. Using the Corpus of Contemporary American English (Davies 2008), the six most frequent lexemes were then determined. These lexemes were motherly, girly, girlish, feminine, womanish and woman. The data were taken from the American component of the LiveJournal Corpus (Speelman & Glynn 2005). This corpus is stylistically homogenous, being restricted to personal diaries, written largely by young British and American students. For each lexeme, 200 examples for each form were extracted, each with a large context of 200 words left and right. Occurrences that were quotations, adverbs or from the titles of diary entries were omitted. The frequencies of the lexemes and lemmata after cleaning are presented in table 1.

Table 1. Lexeme and lemma frequency of FEMININE keywords

<table>
<thead>
<tr>
<th>Lexeme</th>
<th>Frequency</th>
<th>Lemma</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>feminine</td>
<td>201</td>
<td>FEMININE</td>
<td>201</td>
</tr>
<tr>
<td>girlish</td>
<td>139</td>
<td></td>
<td></td>
</tr>
<tr>
<td>girly</td>
<td>69</td>
<td>GIRLY</td>
<td>208</td>
</tr>
<tr>
<td>motherly</td>
<td>120</td>
<td>MOTHERLY</td>
<td>120</td>
</tr>
<tr>
<td>womanish</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>womanly</td>
<td>69</td>
<td>WOMANLY</td>
<td>149</td>
</tr>
</tbody>
</table>

2.3 Analysis. Manual annotation of sample

The usage-feature analysis in this study examines 4 different dimensions. Each dimension, or factor, is designed to come together to offer a picture of the representation, and arguably the conceptualisation, of FEMININITY. The factors include Topic of Discourse, Referent Type, Referent Gender, and Evaluation. Each factor is explained and exemplified below.

2.3.1 Topic of Discourse

The topic of discourse is a crucial factor in this analysis. In language and culture, gender is associated with certain roles and social domains. The annotation of Topic of Discourse permits the identification of the correlation between the conceptualisation of FEMININITY and various gender roles.
(1) Emotion & psychology
Ask a parent, neighbor, sibling, or close friend whom you trust to keep them for a few hours while you regain your motherly strength

(2) Entertainment & fame
the car was made famous among the female species thanks to the constant promotional effort by the most girly and popular hotel heiress, Paris Hilton.

(3) Family & love
Ray has always been ready and willing to learn and help, and trusts my motherly knowledge when it comes to things like not eating orangey baby food.

(4) Gender & stereotype: because the feminine dimension is something of a problem for the difference between the sexes,

(5) Health & appearance
I would love to develop a very feminine/traditional waistline through belly dancing.

(6) Science, religion & politics
A year ago the New York Times launched a special “feminine section” on women changing the world, and the Dalai Lama flattered many of us, when he declared that the Western Woman will save the world.

(7) Fashion & decor
They are very cute, very womanly. Flower motif was obviously dominant and it was good.

(8) Behaviour & attitude
I was much more afraid that she would have given him the motherly finger wag and then would have gone on to praise Vick for “turning the corner,” regaining his equilibrium, etc.

(9) Art & culture
The line has all of our core aesthetic – clean details, rich prints, always a masculine meets feminine moment, and details without being frilly or overly girly in any way. I have to say personally for me this is one of the

2.3.2 Referent Type
Referent Type is a basic semantic factor which indicates the referent of the adjective. It is designed to answer the questions: Are the feminine adjectives being used to talk about people or things and, if so, what kinds or things and what kinds of people. The annotation of this factor can be highly subjective. For this reason, coarse grain categories are used. In the confirmatory analysis
below, the categories are further conflated to make a binary distinction between animate and inanimate.

(10) Inanimate Abstract
*féminine* intuition stuff sells magazines, but in real life it's still a fairy tale

(11) Inanimate Concrete
*Feminae* tattoos are generally smaller and far prettier than those for men.

(12) Inanimate Activity
I've never known any male who thought it was *womanly* or effeminate to cook

(13) Inanimate SoA (state-of-affairs)
For example, in the film London to Brighton, a prostitute is shown in a very *motherly*, caring way and..

(14) Inanimate Event
“If you don't graduate from college, you won't get a good job,” I responded with a tinge of panic and *motherly* concern.

(15) Human Specific
She's more stylized, she's more *féminine*, she's more a woman as she dances this time around.

(16) Human Generic
As for me, *girly* girl is likely to be a girl that wear skirt, fancy headband, sweet pumps, "kawaii" accessories, other pink stuffs, and love ballet

2.3.3 Referent Gender
The gender of the referent is obviously crucial in gauging the use of the adjectives. Four categories were needed to account for the data. Masculine and feminine referents, but also unknown and mixed gender referents had to be allowed for. Finally, a category of ‘non applicable’ was used for inanimate referents.

(17) Female
The woman had a very kind motherly tone in her voice, which reminded her suddenly of her mother that had passed away 5 years ago
(18) Male
He acts *womanish* toward Hearn, scorned and jealous, lashing out needfully.

(19) Unknown
For a minute, let's forget about *girly* and focus on non-manly. I am in the process of building a 2nd desktop

(20) Mixed
The fact that so many White's accept these lies shows how *womanish* and effete the race has become

(21) Non Applicable
It seems to me there should be a widely accepted vision of what *feminine* power should look like, and...

2.3.4 Evaluation
The category of evaluation is highly subjective. The annotation is operationalised by assuming that the use is neutral unless there is clear textual indication to the contrary. Typically the use of adverbs and adjectives were the criterion used to determine either positive or negative evaluation. This rule is not, however, categorical and, for certain occurrences, encyclopaedic semantics were used, as in example (24).

(22) Neutral
One trend that appears to be emerging in the collections this Fashion Week is the blend of the masculine and the *feminine*.

(23) Positive
The New Look bomb astonished with its flamboyant colors and wonderful *womanly*, flower-like silhouettes that altered style codes and brought desire back to life.

(24) Negative
If it were not for the bloodshed there, his rantings on TV this morning in a *womanly* voice would have been comical.
3. Results

3.1 Mapping the lexical semantics

Due to practical limitations, this study will be restricted to an analysis at the level of lemma. The first step was to identify correlations between Topic of Discourse and the different lemmata. Figure 1 presents the results of a multiple correspondence analysis that identifies the correlations between Lemma, Topic of Discourse, Referent Type and Evaluation.

Biplots, such that that in Figure 1, represent relative degrees of associations (positive correlation) and disassociation (negative correlation) through the proximity of the data points in the two-dimensional plane. As such, each biplot is a two-dimension representation of multidimensional space, where the correlation of all of the factors (features) are calculated simultaneously. The plots also represent distinctiveness in correlation by placing the data points closer to or further from the x- and y-axes; the closer to the axis, the less distinctive it is along that dimension. It follows that data points close to the centre are the least distinctive in usage across both dimensions. Furthermore, the contribution, or relative importance, of each of the data points is represented by the size of the data point; smaller points contributing less to explaining the behaviour of the data, larger points being more important. For a more detailed explanation on how correspondence analysis operates and how to interpret the plots, see Glynn (2014b).

In figure 1, below, we see the dispersion of the usage-features which characterise the use of each of the lemmata. Focusing, at first, on the gender of the referent, we see that Female referent lies directly between the lemmata GIRLY and FEMININE. This means that these two lemmata are equally associated with this referent gender. Moving across the plot, we see that Gender N.A., which refers to inanimate referents, lies between FEMININE and MOTHER. Finally, on the right of the plot we find WOMANLY distinctly associated with Male referents.

However, it is important to note that these associations are relative to both the Topic of Discourse and the Referent Type. In other words, is not simply that these gender referents are associated with these lexemes, but that these genders are associated with these referents, when treated in the context of the other factors. Therefore, on the right, where we see the features ‘negative’ Evaluation, ‘specific human’ Referent and the Topic of Discourse ‘behaviour and attitude’, it is the combination of these features that represents the characteristic pattern, rather than any single association.
Moving across to the left, we see a cluster of features that lie between GIRLY and FEMININE. We can assume that these features are equally associated with each lemma but that a specific feature is disguising them. It appears that although both GIRLY and FEMININE are equally associated with ‘female’ Gender Referents, the Topics of Discourse ‘fashion & decor’, ‘art & culture’, ‘health & appearance’, as well as ‘inanimate concrete’ Referents, they are distinguished by one important difference: GIRLY is distinctly associated with ‘generic human’ Referents in contrast to FEMININE which is being drawn up away from the cluster towards ‘inanimate abstract’ Referents. At the top of the plot, MOTHER is quite distinct in its use. Although it lies between FEMININE and WOMANLY for most of the usage features, it appears distinctly associated with the Topics of Discourse ‘gender & stereotype’ and ‘emotion & psychology’.

None of the associated features identified are surprising, indeed, they are all intuitively sound. This tells us that the overall behaviour of the lemmata matches what one would expect given introspective consideration of their use. The next step it to remove the lexemes from the analysis in an attempt to
identify the structure of the concept per se, rather than the onomasiological structure of the lexemes.

3.2 Mapping the conceptual structure

Having established the onomasiological structuring of the concept by charting the use of the lemmata relative to the range of usage-feature under investigation, we can now examine the patterning of those features without the lexemes to structure them. Before we interpret the results, we need to examine the reliability of the depiction, that is how well the correspondence analysis been able to take a highly complex multidimensional structure and represent it in two-dimensions. Table 2, below, includes the scree plot of the dimension reduction. The plot represents the first two dimensions listed in the table, together accurately representing 63.2% of the variation, or ‘inertia’. For such a complex analysis, this figure is reasonable. Of more concern is the fact that there is no clear ‘elbow’ in the scree plot. In other words, as dimensions are added, at no specific point does the accuracy of representation cease to improve substantially. In other words, there is a gradual decline in the contribution to explaining variation as we add dimensions but at no point can we say a given number of dimensions is sufficient to explain the underlying structure of the data. A possible interpretation of the gradual (as opposed to abrupt) decline in inertia is that the analysis is struggling to represent the complexity of the situation in two-dimensions and we need to be cautious in our interpretations.

Since caution is needed in the interpretation, Table 3, below, offers a break down of each of the features in the analysis and the quality of their representation as well as their contribution to explaining the behaviour of the data along the two axes. Although no absolute rule is possible, any quality scores that are less than 500 in ‘quality’ should be treated with caution (Greenacre 2007). Particularly problematic are the Topics of Discourse ‘art & culture’ and ‘science & politics’, and the Referent Types ‘human generic’, ‘human specific’, and ‘inanimate abstract’. The depiction of the Evaluation features are all extremely reliable.
Table 2. Conceptual Structure: Multiple correspondence analysis, principal inertias (eigenvalues)

<table>
<thead>
<tr>
<th>Dim.</th>
<th>Eigenvalues</th>
<th>% of Inertia</th>
<th>Cumulative %</th>
<th>Scree Plot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.132793</td>
<td>44.9</td>
<td>44.9</td>
<td>************</td>
</tr>
<tr>
<td>2</td>
<td>0.054108</td>
<td>18.3</td>
<td>63.2</td>
<td>**********</td>
</tr>
<tr>
<td>3</td>
<td>0.029802</td>
<td>10.1</td>
<td>73.3</td>
<td>*****</td>
</tr>
<tr>
<td>4</td>
<td>0.015083</td>
<td>5.1</td>
<td>78.4</td>
<td>***</td>
</tr>
<tr>
<td>5</td>
<td>0.008478</td>
<td>2.9</td>
<td>81.2</td>
<td>**</td>
</tr>
<tr>
<td>6</td>
<td>0.004128</td>
<td>1.4</td>
<td>82.6</td>
<td>*</td>
</tr>
<tr>
<td>7</td>
<td>0.002526</td>
<td>0.9</td>
<td>83.5</td>
<td>*</td>
</tr>
<tr>
<td>8</td>
<td>0.001658</td>
<td>0.6</td>
<td>84.0</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>0.000589</td>
<td>0.2</td>
<td>84.2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.000146</td>
<td>0.0</td>
<td>84.3</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>0.000000</td>
<td>0.0</td>
<td>84.3</td>
<td></td>
</tr>
</tbody>
</table>

A note of explanation is due here concerning the concatenation of the Referent Gender and Referent Type. In order to minimise the dimensionality of the analysis, the Gender of the referent and the Referent Type have been combined. This means that, in some instances, we have a combination of a gender referent and an inanimate referent together. This is due to the fact that there are many uses where the adjective describes an inanimate feature associated with a human, such as, for example, *he has a feminine voice*. In such instances, although the actual referent is inanimate (‘voice’), the fact that the voice belongs to a man is the most relevant characteristic.

Figure 2, below, presents the results of a multiple correspondence analysis that includes all the usage-features but not the lexemes. The data points appear to cluster into three broad groups. These can be understood as sub-categories of the concept of FEMININITY. In the top-right, dominated by ‘negative’ Evaluation, we have the clustering of ‘male’ Referent Gender as well as the Topic of Discourse of ‘behaviour & attitude’. This cluster mirrors what we saw above and seems to be both intuitively sound and clear: FEMININITY as a behaviour, especially when associated with men, is negative.
To the left of the plot, another relatively clear cluster is dominated by ‘positive’ Evaluation. Here the Topics of Discourse are ‘fashion & decor’, ‘art & culture’, and ‘health & appearance’. The Gender of the referents is a more complex picture than for the right-hand cluster. ‘Female’ Referents and ‘inanimate objects’ as Referents are clearly associated with this clustering, but specific ‘female’ Referents actually lie between this cluster and the ‘negative’ Evaluation - ‘male’ Gender cluster. This would suggest that when the Referent Gender is ‘female’ and the focus of the discussion is behaviour, ‘negative’

<table>
<thead>
<tr>
<th>Feature</th>
<th>Quality</th>
<th>$x$ - Axis Contribution</th>
<th>$y$ - Axis Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>ToD.: art &amp; culture</td>
<td>111</td>
<td>-128</td>
<td>1 -231</td>
</tr>
<tr>
<td>ToD.: behaviour &amp; attitude</td>
<td>878</td>
<td>757</td>
<td>185 -183</td>
</tr>
<tr>
<td>ToD.: emotion &amp; psychology</td>
<td>584</td>
<td>262</td>
<td>9 499</td>
</tr>
<tr>
<td>ToD.: entertainment &amp; fame</td>
<td>255</td>
<td>-118</td>
<td>1 246</td>
</tr>
<tr>
<td>ToD.: family &amp; love</td>
<td>530</td>
<td>135</td>
<td>3 516</td>
</tr>
<tr>
<td>ToD.: fashion &amp; decor</td>
<td>674</td>
<td>-501</td>
<td>132 -78</td>
</tr>
<tr>
<td>ToD.: gender &amp; stereotype</td>
<td>462</td>
<td>262</td>
<td>27 170</td>
</tr>
<tr>
<td>ToD.: health &amp; appearance</td>
<td>407</td>
<td>-162</td>
<td>19 -228</td>
</tr>
<tr>
<td>ToD.: science &amp; politics</td>
<td>191</td>
<td>-105</td>
<td>1 309</td>
</tr>
<tr>
<td>Ref.: FEM + Inanimate Abstract</td>
<td>595</td>
<td>-10</td>
<td>0 309</td>
</tr>
<tr>
<td>Ref.: FEM + Inanimate Concrete</td>
<td>816</td>
<td>-505</td>
<td>95 -178</td>
</tr>
<tr>
<td>Ref.: FEM + Inanimate Event-Activity</td>
<td>557</td>
<td>499</td>
<td>25 -446</td>
</tr>
<tr>
<td>Ref.: FEM Human Generic</td>
<td>591</td>
<td>138</td>
<td>1 -330</td>
</tr>
<tr>
<td>Ref.: FEM Human Specific</td>
<td>202</td>
<td>57</td>
<td>1 -118</td>
</tr>
<tr>
<td>Ref.: FEM Inanimate SoA</td>
<td>562</td>
<td>260</td>
<td>5 369</td>
</tr>
<tr>
<td>Ref.: Human Generic</td>
<td>175</td>
<td>-101</td>
<td>1 -326</td>
</tr>
<tr>
<td>Ref.: Inanimate Abstract</td>
<td>221</td>
<td>-165</td>
<td>10 187</td>
</tr>
<tr>
<td>Ref.: Inanimate Concrete</td>
<td>516</td>
<td>-433</td>
<td>46 -274</td>
</tr>
<tr>
<td>Ref.: Inanimate Event-Activity</td>
<td>550</td>
<td>511</td>
<td>24 8</td>
</tr>
<tr>
<td>Ref.: MALE + Inanimate Abstract</td>
<td>754</td>
<td>586</td>
<td>41 -40</td>
</tr>
<tr>
<td>Ref.: MALE + Inanimate Concrete</td>
<td>560</td>
<td>431</td>
<td>10 -182</td>
</tr>
<tr>
<td>Ref.: MALE Human</td>
<td>756</td>
<td>623</td>
<td>59 -377</td>
</tr>
<tr>
<td>Evaluation: Negative</td>
<td>930</td>
<td>679</td>
<td>209 -257</td>
</tr>
<tr>
<td>Evaluation: Neutral</td>
<td>870</td>
<td>-94</td>
<td>13 147</td>
</tr>
<tr>
<td>Evaluation: Positive</td>
<td>902</td>
<td>-285</td>
<td>49 -162</td>
</tr>
</tbody>
</table>
evaluation is common. Further research would be need to verify this, but it is an astounding result.

The bottom cluster is broad, stretching across the x-axis and could be argued to pre-sent two sub-clusters. However, given the homogenous nature of the features clustered, interpreting this as a single pattern appears most reasonable. The cluster is dominated by ‘neutral’ Evaluation and a range of ‘inanimate’ and ‘female’ Referent Types. It would seem that states of affairs, activities and events, associated with women are evaluated as neutral and that such a conceptualisation is associated with the Topics of Discourse of ‘entertainment & fame’, ‘science & politics’, ‘family & love’, and ‘emotion & psychology’. The Topic of discourse ‘gender and stereotype’ is also grouped with this cluster but is drawn up towards the right top of the plot and the cluster of male referents and negative evaluation of behaviour.

Figure 2. Conceptual Structure: Multiple correspondence analysis
Correlations between Topic of Discourse, Referent Type and Evaluation
3.3 Confirmatory analysis of conceptual results

Although we have considered the stability of the results above and have identified structures in the sample that we can, with confidence, interpret as conceptual structures, correspondence analysis offers no information about the probability that the correlations and patterns identified are representative of the language more generally (beyond our sample). In order to obtain information about the significance of the identified structures, we need to turn to confirmatory analysis. Due to the need for a larger data set relative to the number of factors under investigation, the results of the confirmatory analysis are necessarily less broad than that of those obtained through correspondence analysis. Moreover, just because one does not obtain a significant correlation in the confirmatory analysis, where we do see a correlation in the correspondence analysis, does not indicate a falsification of the previous result, merely that we have not been able to confirm that result. Data sparseness is just as likely a cause of non-confirmation as a misleading result in the previous section.

We employ loglinear analysis in the confirmatory stage (Agresti 2013). This method is essentially a large number of Chi-squared tests that seek to ascertain if the positive and negative correlations observed above are significant. In Figure 3, the results of the loglinear analysis are presented in the format of a mosaic plot.

The visual representation of the results of the loglinear analysis are detailed and somewhat difficult to interpret. They plot significant positive and negative correlation between 4 factors simultaneously. Therefore, each box in the plot represents the co-occurrence of 4 different features. The blue boxes represent a significant positive correlation (association) and the red boxes a significant negative correlation (disassociation). The darkness of the colour, blue or red, indicates relative effect size, darker representing strong effect. The size of the box is determined by relative frequency and grey boxes mean that the association is not statistically significant.

The most striking result is across the top row where we see significant associations between ‘negative’ Evaluation, the Topics of Discourse ‘appearance’, ‘behaviour’ and ‘gender’ and ‘animate’ ‘male’ referents. Although this is completely in line with what the correspondence analyses revealed, it is here confirmed as significant. Again confirming what we saw above, significant positive correlation between ‘neutral’ Evaluation,
‘inanimate’ & ‘female’ referents and the Topics of Discourse of ‘appearance’, ‘behaviour’ and ‘fashion’ is revealed. One of the largest significant correlations is between ‘positive’ Evaluation, ‘inanimate’ Referent and the Topic of Discourse of ‘fashion’. Two significant negative correlations are observed. Firstly, ‘female’ & ‘inanimate’ referents do not co-occur with ‘negative’ Evaluation in the Topic of Discourse of ‘appearance’. Secondly, ‘neutral’ Evaluation does not combine with ‘inanimate’ Referents also for the Topic of Discourse of ‘appearance’. Save the this latter negative correlation, all the observed associations align with what we have observed in the correspondence analysis and match an intuitive picture of the conceptualisation of FEMININITY.

Figure 3. Conceptual Structure: Mosaic plot of loglinear analysis
Significant positive and negative multidimensional correlations of Evaluation, Gender, Animacy and Topic of Discourse

4. Summary
The study revealed systematic patterns in the usage of the lexemes denoting FEMININITY. Without lexical or metaphoric structuring, a combination of Referent, Evaluation and Topic of Discourse revealed three subcategories of
the representation of the concept amongst young speakers in personal diaries. Two of these multidimensional subcategories were confirmed and demonstrated to be statistically significant.

Subcategory 1 – statistically confirmed
Referent: Male
Evaluation: Negative
ToD: Behaviour & Attitude

Subcategory 2 – statistically confirmed
Referent: Female + Inanimate Concrete
Evaluation: Positive
ToD: fashion & decor, art & culture, health & appearance

Subcategory 3 – not confirmed
Referent: Female + Events - Activities & States of Affairs
Evaluation: Neutral
ToD: entertainment & fame, family & love, emotion & psychology, science & politics

In this study, the proof-of-principle that keyword analysis of abstract concepts can been performed in Multifactorial Usage-Feature Analysis has been demonstrated. This marriage of methodologies provides quantified corpus-driven results which can be falsified through repeat analysis and which are sensitive to social variation. In this study, social variation has been restricted to Topic of Discourse, but the extension of this to other extra-linguistic variables is methodologically straightforward. The main limitation in this regard is data sparseness. The manual analysis of the usage-feature analysis is laborious and time consuming, meaning that practical constraints limit the number of examples that can be annotated in a give study. We saw that small sample size dramatically restricts the possible complexity of the modelling. This is especially true for confirmatory analysis. However, the possibility for modelling conceptual-functional structures without a tertium comparationis, such a linguistic form or a ‘conceptual metaphor’ has been demonstrated. More complete studies that bring in different languages and / or language varieties or diachronic change, will still be needed to see if the increased complexity can be adequately modelled with the limited data available in manually annotated language samples.
5. References
Quantitative studies in polysemy and synonymy (pp. 117–144). Amsterdam: John Benjamins.


