International Conference on Optimization, Simulation and Control
Mental Space and Semantic Frame with Language - Mathematical Models

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The 7th International Conference on Optimization, Simulation and Control
June 20-22, 2022 | Ulaanbaatar, Mongolia

UNIVERSITY OF THE HUMANITIES
The powerful mind is your future success

Abstract

Statistical approaches employ various mathematical techniques and often use large text corpora to develop approximate generalized models of linguistic phenomena based on actual examples of these phenomena provided by the text corpora without adding significant linguistic or world knowledge.

In the present work we have applied the usual mining algorithms to find associations among the pieces of information extracted from many different propositional texts which are taken from the fashion magazine articles. In the different representation of fashion frame for women, it is quite logical to divide unto 4 primary conceptual units about various aspects; the study paper aimed to study on the structure of the concept "Female fashion" and patterns of its concept in the language based on cognitive frame. The object of research is the linguacultural concept "Female fashion", considered as a structural education, including a finite number of areas united by systemic connections, and finding a verbal representative means of the text. The subject of the study is the structure and patterns verbal representation of the concept "Female fashion" in language in paradigmatic and syntagmatic levels. This work was sampled with lexical units under the concept "Female fashion", extracted from popular and specialized British and American fashion magazines and newspapers. In order to conduct deeper study on world of English-language in the perspective manner of women, the interest of linguists in the female concept modelling for the mental space. Female gender shows 4 macro concepts on fashion mental framing. With the mental modelling frame, this paper tries to highlight specific corpus on lexical units of female concept frame in English language. It analyzed here by lexico-semantic methods as considering female fashion concept has different features of a linguoculture of mental space as the active cognitive activity.

Introduction

Fashion has an undeniable influence on our mental state. Clothing can boost our mood, boost our confidence, or help us build character. Designers and wearers can consciously choose cuts, colors and patterns that enhance the mood. The industry is also getting louder about these kinds of issues. Mental models are personal, internal representations of the external reality that people use to interact with the world around them. They are constructed by individuals based on their unique life experiences, perceptions and understanding of the world.

A mental model is the representation that a person has in his head of the object he interacts with. A conceptual model is the actual model given to the person through the design and interface of the actual product. (Susan M. Weinschenk. 2011)[1] The term mental models is sometimes used to refer to mental representations or mental simulation in general. The concepts of schema (psychology) and conceptual models are cognitively adjacent. This research will provide insight into mental models in women's fashion and the meaning of this particular concept in language by analyzing different texts. Researchers have applied the concept of mental models to understand how women behave in fashion and its relationship to their knowledge base, assumptions, predictions and expectations. This research also provides insight into the relationship between culture, gender and mental models. As all linguistic units evoke a semantic frame, a variety of construal operations are being employed in language. (Ronald W. Langacker, Cognitive Grammar: A basic introduction. Oxford: Oxford University.,1983)[2]. A frame, or semantic frame, is a conceptual structure or experience-based schematization of the speaker's world which underlies the usage of lexical units. Thus, the meaning of lexical units (LU), which, following Cruse (1986), are defined as a "pairing of a word with a sense" (Fillmore et al., 2003: 235), should be described in relation to a frame, that is to say "a schematic representation of a situation, involving various participants, props, and other conceptual roles, each of which is a frame element" (Fillmore and Petruck, 2003: 359)[3]. In these terms, a semantic frame is an essential linguistic construct for the analysis of meaning in language, since in order to understand a lexical unit the frame that it evokes, and its conceptual parts must be known.

The purpose of cognitive linguistics is to explore how the processes of perception, categorization, classification and understanding of the world are carried out, how knowledge is accumulated, which systems provide various types of activities with information.

The results from the effective structuring of language information with the active use of cognitive structures, among which the leading role is assigned to the frame, a complex cognitive structure, the activation of which provides the interpretation of various situations and is a certain form of manifestation of the concept (Hayes, 1980; Minsky, 1980)[4]. Further study of the systematic nature of lexical units by displaying the analyzed concepts on female fashion, main features of a system of such concepts made Women's fashion possible to allocate into 4 core macro areas based on categorization of mental frame and mental space. It is also possible to classify the vocabulary of commonly used terms in term by using using mental modelling algorithm. Therefore, the concept of women's fashion looks complicated, with details of language and linguoculture, it is to deploy such a specific structure of the analyzed concepts, the corpus models and its verbalization by women fashion framing.
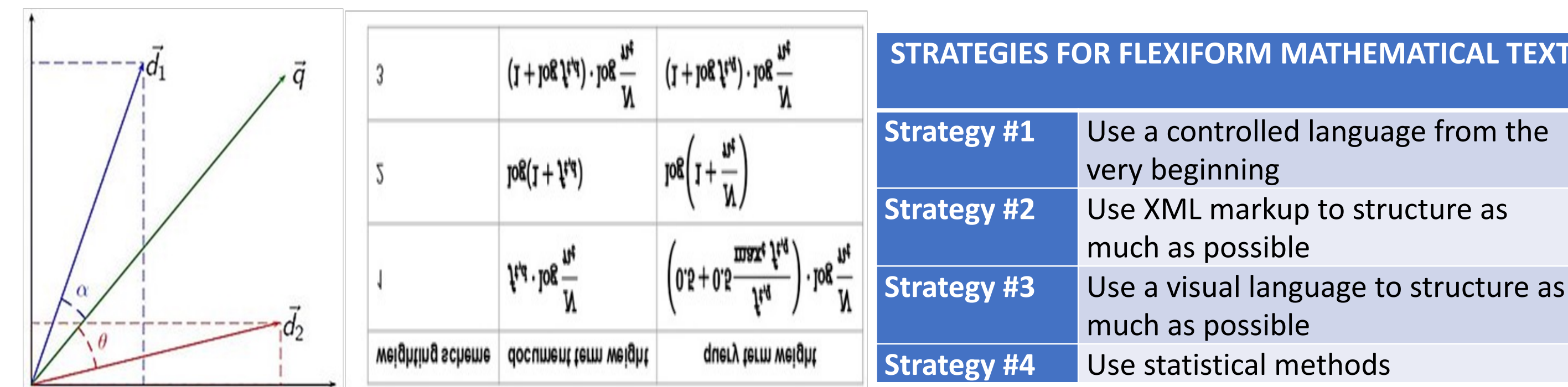
Methods and Materials

Data processing:

We used some of the popular Natural Language Processing (NLP) Python libraries for pre-processing texts,

The following steps were taken in order to pre-process the tweets:
- tokenization to split tweets into discrete words;
- removal of numbers, punctuation marks, emojis, URL paths, symbols, non-alphabetical words, English stop words, and tokens with Appl. Sci. 2021, 11, 10169 4 of 18 less than one character;
- text lemmatization including Part-Of-Speech (POS) Tagging to reduce the dimensionality of the corpus into only nouns, verbs, adverbs, and adjectives;
- elimination of tokens with low frequency on the corpus; stemming of words
- LDA for Topic Modeling Latent Dirichlet Allocation (LDA) is a generative probabilistic model of a corpus. This algorithm considers that each document is described by a distribution of topics, and each topic can be reduced to a mixture of words based on the frequency to be assigned to that topic.
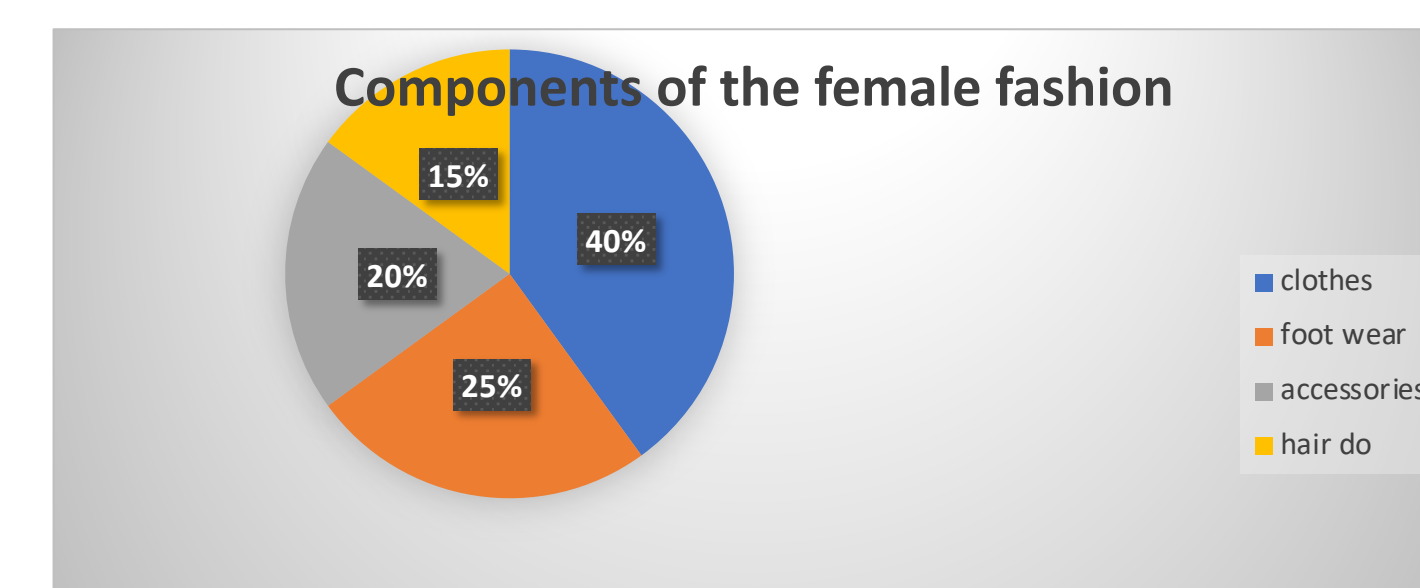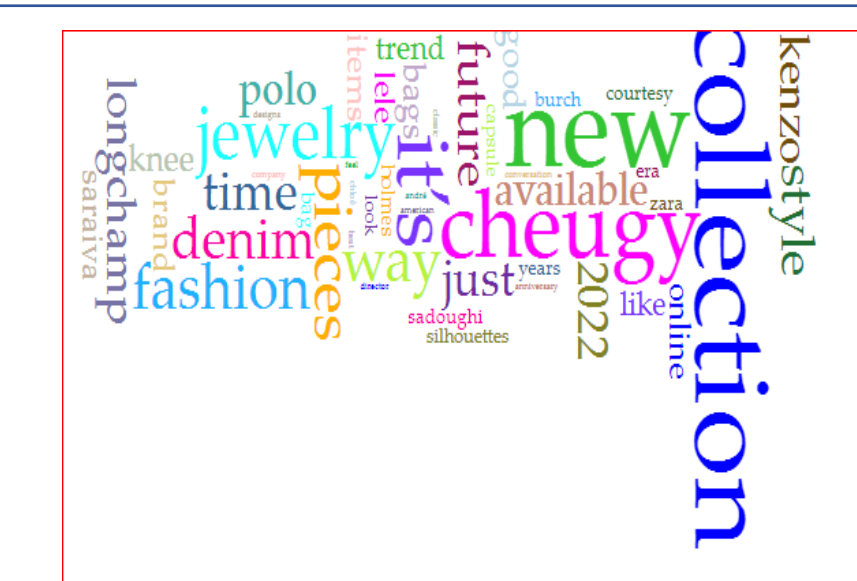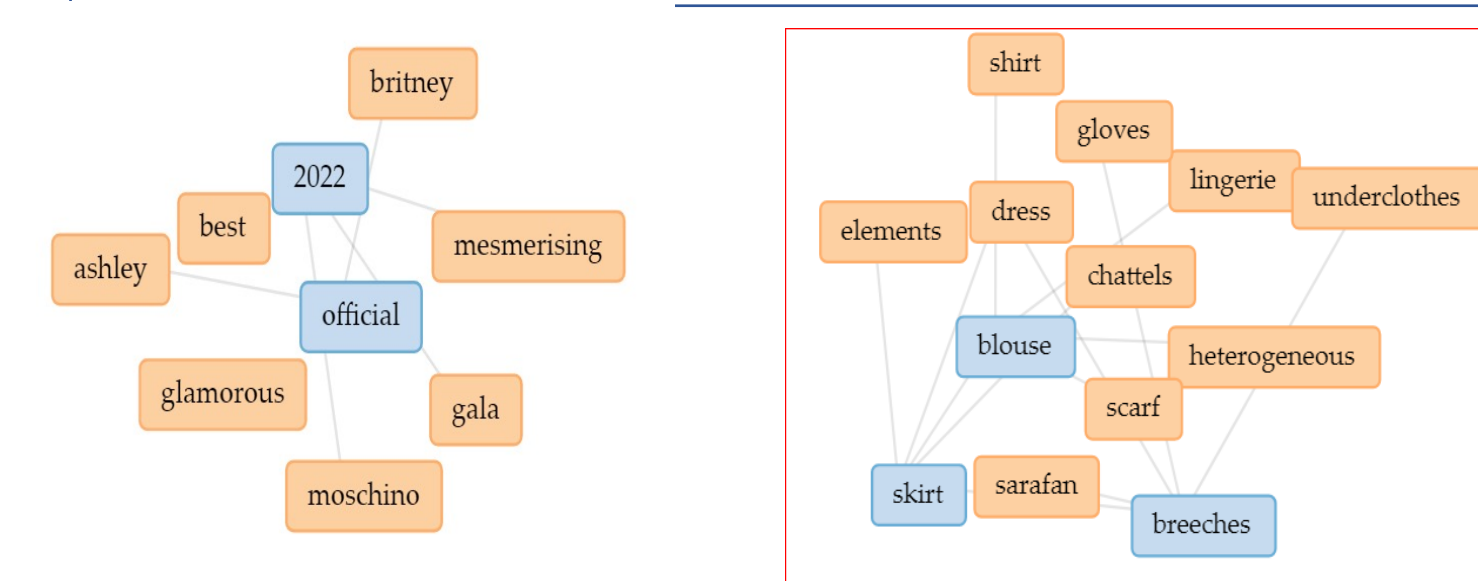
Using magazine and fashion texts for females, the explorative on mentality or mental modelling, quantitative research was carried out based on 4 core and macro concepts of female fashion. 4 garments categorized according to mental framing and mental model. With the benefits of mathematical algorithm, Female fashion concepts are identified in relationship with language and linguoculture factors.

3	$(1 + p\mathbf{X}'\mathbf{V}^{x}) \cdot p\mathbf{X}\frac{s^{\mathbf{u}}}{Y_{s}}$	$(1 + p\mathbf{X}'\mathbf{V}^{x}) \cdot p\mathbf{X}\frac{s^{\mathbf{u}}}{Y_{s}}$	
3	$p\mathbf{X}(1 + \mathbf{V}^{x})$	$p\mathbf{X}\left(1 + \frac{s^{\mathbf{u}}}{Y_{s}}\right)$	
1	$\mathbf{V}^{x} \cdot p\mathbf{X}\frac{s^{\mathbf{u}}}{Y_{s}}$	$(0/2 + 0/2 - \frac{smx^{x}}{\mathbf{V}^{x}})^{1}\cdot p\mathbf{X}\frac{s^{\mathbf{u}}}{Y_{s}}$	

STRATEGIES FOR FLEXIFORM MATHEMATICAL TEXT	
Strategy #1	Use a controlled language from the very beginning
Strategy #2	Use XML markup to structure as much as possible
Strategy #3	Use a visual language to structure as much as possible
Strategy #4	Use statistical methods

Results

There are 1230 unique words out of 2638 words. The field combines as homogeneous elements - lexemes: *breeches, dress, gloves, sarafan, underclothes, skirt, shirt, scarf, stockings, slipper, blouse, lingerie, veil,* so and heterogeneous elements - phrases: *split skirt, goods* and *chattels; high overshoes; woman's sleeveless jacket; underwear slip*, etc.

The most **frequent words** in the corpus: collection (20); new (14); cheugy (12); it's (12); jewelry (9); fashion (8); pieces (8); denim (7); future (7); just (7); style (7); time (7); way (7); 2022 (6); available (6).

Components of the female fashion

- clothes 40%
- foot wear 25%
- accessories 20%
- hair do 15%

Lexical Concepts of Female Fashion	
Simple words	65%
Derived words	1.7%
Compound words	25.3%

Discussion

Through this research work we aimed to analyze existing points of view on nature concepts, define the essence of the FEMALE FASHION concept and indicate its status in relation to lexical units and their meanings, and present the model of the FEMALE FASHION concept in the form frame structure, reveal the content of frames, sub-frames, slots and terminals of a given structure, to differentiate the static and dynamic (frame and scenario) components of the frame. The content and scope of the FEMALE FASHION concept are presented as a four-component structural model, characterized by the presence of a number of salience conceptual features and consisting of four areas (CLOTHES, ACCESSORIES, FOOTWEAR, HAIRDO), each of which breaks down into a finite number subdomains, micro-domains and fragments. most extensive and representative in the aspect of verbal representation is the area CLOTHES. There is a complex interaction of all selected areas of the described concept, as a result of which the concept FEMALE FASHION qualifies as an integral unit of the linguistic picture in terms of content. All data from macro-domains are summed up from the series subdomains, micro-domains and fragments.
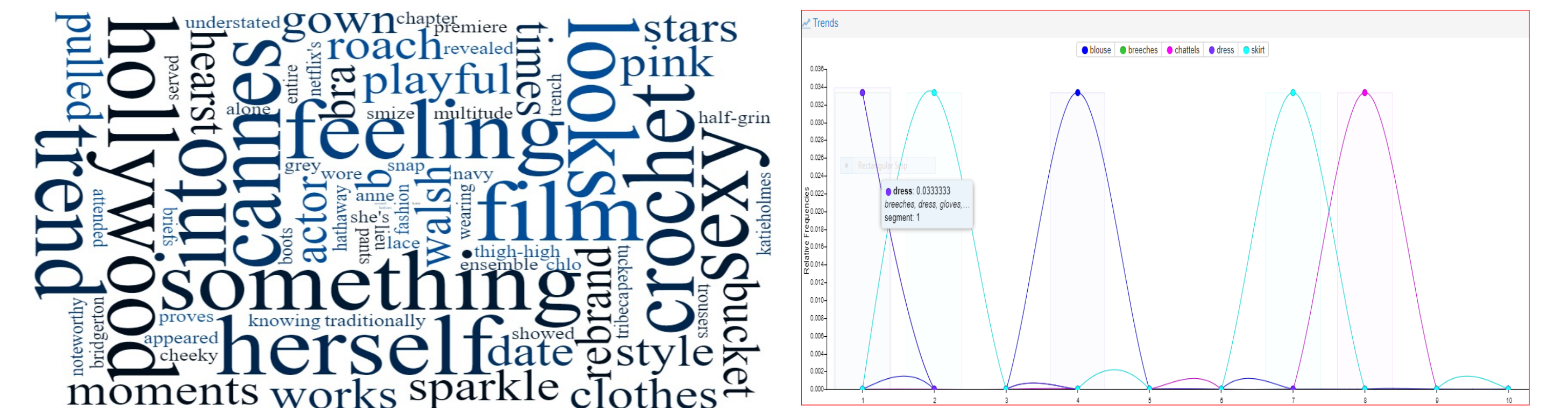
Conclusion

The concept of the FEMALE FASHION is presented as a complex dynamic mental formation, marked by linguistic and cultural specifics and revealed as a four-component structured system. The results indicated female fashion and its 4 factors in the preference of clothing: physical features of clothes including accessories, hair-do's, clothes and shoe-related, revealing levels and visual features- the study analysed in linguistic perspective by analysing fashion texts for female mental space. The results also showed how female mental space works based on magazine and fashion texts and its lexical units. While more research is needed to investigate the mental framing on female fashion and to build on the current methodology and findings to the both lingua and gender factors on fashion. Due to such a specific structure of the analyzed concept, the corpus model of its verbalizers is a four-core lexical semantic field, the elements of which are united by a whole complex of semantic relations. Overall, the implemented prototype only analyzes a small one.

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