意味の構造化によるグラフィックデザインの方法
Method of Graphic Design by Coordination of Meanings
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概要：グラフィックデザインでは、作品からどのような意味を想起されるかが重要である。本発表では、グラフィックデザインの事例として、ロゴに焦点を当てた研究を示す。我々の研究では、良いロゴから想起される意味は、よく構造化されているという仮説を設定する。そして、ロゴの持つ意味構造と好ましさとの関連を検討した調査結果を示し、調査の結果からロゴに意味構造を付与するデザイン支援の方法論を論じる。我々は調査参加者にロゴを提示しそれぞれが想起した意味をできるだけ多く記入させる調査を行った。その後、それぞれのロゴの好ましさを5段階で評価した。得られたロゴの意味の相互の関連を、概念辞書を用い、相關を調整した。

Key words: meanings, concepts relatedness, logotype

Introduction
The meanings of logotypes and their characteristics are researchable from the viewpoint of creativity. The traditional approach of research [1] in this field is focused mainly on connecting logotype characteristics, based on user’s responses and evaluation to describe guidelines of design. In fact, this traditional approach is more likely to reduce creative results and to make logotype design more uniform, rather than distinctive. Also making design more dependent on current trends, but a really strong logotype should be distinguishable and to a certain extent ‘timeless’. However, no extensive research on the meanings characteristics was done [2].

Aim
To define the characteristics of logotype meanings and their relations; and to answer which characteristics have the greatest importance to its successful image. What meanings’ characteristics and features lead to the perfect logotype? Analyzing these results, we can develop a method for supporting meanings use in order to expand concept space and increase creativity in the graphic design process. This research establishes a methodology for supporting the creative design process of logos and symbols generally.

Survey of meanings of logos
The method of this research is questionnaire that collects information about the evaluation and the meanings perception of logotypes given. The final results present the connection between discovered meaning’s differences and evaluation of logotypes. Based on the questionnaire results, a comparison between the values of evaluation and meanings distances for every sample is made.

A sample of 40 logos is chosen, from different countries of origin, resources, with varying construction elements, proportions, elaborateness and color schemes. This selection covers a broad range of logotype design and applications. Eleven graduate school students in area of Knowledge Science and Design from Japan Advanced Institute of Science and Technology voluntarily participated in the questionnaire. All participants have a certain degree of knowledge on topics like composition and creativity in design. Structure is as in Table 1: Question 1 · for logotype evaluation, Question 2 · all discovered meanings.

Analysis and result
The results from the questionnaire were used to investigate the connection between logo evaluation and participants’ viewpoints on meanings.

Primary observed parameters are Average evaluation score and Average number of discovered meanings (Respectively for Question 1 and Question 2). Secondly, calculations of Average distance between meanings of the logotypes were made. Total answers (including all participants) for every logotype meanings define a space of users’ concepts for every example.

For the meanings difference analysis, the WordNet 2.1 concept dictionary was used. Knowledge structure of noun organization in hierarchy of WordNet was used. This is a measure of semantic distance between concepts, for our research – distances between discovered meanings in logotype image. All measured word distances from answers to Question 2 are for nouns with “is-a” relations, and the paths in the tree for every pair of words are calculated. Every logotype example has a calculated Average distance between its meanings.

No strong positive correlation between Average number of meanings and logotype Average evaluation is observed. The examples with multiple meanings are slightly better evaluated. However the connection between Average distance of meanings and Relatedness of meanings (Fig. 1) of logotypes is strongly positive, and this is significant – r (38) = 0.45, p<0.01. The close concept coordination between meanings gives a better evaluation.
Discussion
The participants’ interpretation of meanings is important for likeability. Well evaluated logotypes are meaningful and sense-related. The results are more applicable also for the reason, that participants are familiar with design process characteristics and difficulties.

The main point of this research is that concentrated and coordinated meanings’ characteristics with highest importance for logotype usage must be studied from the design process viewpoint. Higher evaluation involved meanings with better user ‘definition’ of shape, extraction from background, better recognition, straightforward meaning, and finally user’s image of represented matter. Knowledge of symbols’ meanings from a users’ point of view, and that connection with designers’ view is a main characteristic of later proposed support of design process.

This design support method is applicable in both typical logo design tasks – redesign and newly developed logotype design. The method will contribute to avoiding usual mistakes: non-meaningful shape, misinterpreted shape and non-recognizable shape. Matching meanings intended in the design process and the practical interpretation of meanings, and identifying possible differences between is essential in supporting design process. Well-designed logotypes convey their meanings to some degree using only their graphical elements [1], so that the effectiveness and support of meanings implementation in the design process can be researched.

Proposal of supporting system for graphic design
As a result of analysis, we are proposing a support method for graphic design, based on structuring the meanings [3]. It will be constituted by concept dictionary and database with visual form · word label associations. The semantic structure from concept dictionary should be extracted, shown to user and implemented in levels of logotypes morphology. Exploring possibilities of meanings’ match from lower to upper levels will give more creative results and better meanings’ integration. For example, especially if the concept dictionary connections are represented in morphology structure of logo, this will give coordinated and creative symbol. The support system will give better synthesis of initial concepts in final symbol. Furthermore it will provide new possibilities for synthesis by expanding space of concepts. The conceptual synthesis is a key to creativity in design process [4]. Using this system, we believe that support of meanings’ coordination will contribute to design education. Specifically this support will make creative logo design more efficient, to get highly creative design results.

Conclusion
Logotypes that create the best impression should have integrated meanings, so that the final image is quickly perceptible and has rich meaning. This means that participants in our study estimate highly the logos with narrow meanings. In summary, the closer coordination of meanings is a more important factor than simplicity in likeability of logo. It is characteristic of creative logotype design. The closely coordinated concepts lead to successful logo image.

This evaluation of symbols in context of meanings and structure in various design layers is base for structural approach to meanings. The main achievement should be knowledge of how to support creation of logos with highly creative meanings, also identifying difficulties in existing logotypes.

In future we intend to propose a symbol and logotype design support system, constituted by database and concept dictionary. An application to the described approach in this paper could be used in system to get highly creative design results. This knowledge about determination of meanings contributes to creative logotype design.

REFERENCES