

COMPARATIVE STUDY ON TYPOLOGIES OF HUMAN NEEDS

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ABSTRACT: Human needs represent the fundamental requirements and desires of individuals for survival, development, and happiness. Fundamental needs are those applicable regardless of culture, age, or social status and can create physical or psychological problems when not met.

This paper presents the results of a study conducted on a group of participants with higher education who shared their opinions regarding the typologies of Maslow's and Desmet-Fokkinga's needs to determine which of these contains clearer, more relevant, and more useful needs for experimental research. The accuracy of the obtained results was tested using the Z score, and the data reliability was tested using the Cronbach's alpha coefficient.

At the end of the paper, a conclusion is presented regarding the differences between the two analyzed typologies.

KEYWORDS: human need, industrial design, product design.

1. Introduction

The necessity (need) is the state associated with humans and other living beings, determined by the lack of an object, phenomenon, or essential relationships for survival, fulfilling social functions, or achieving a state of satisfaction. [1]

Needs are the foundation of our motivational system, and all human activity is essentially and continuously driven by the aspiration to satisfy those needs [2]. As a result, the design activity, especially of product development, becomes strongly conditioned by human needs. However, the conditioning of industrial design by necessity goes beyond the connection between the designed product and the needs of the end user. In the design process, psychological needs of the designer and other factors also come into play.

When a need is fully and timely satisfied, a pleasant state arises, which leads the user to associate the use of the product with a positive experience [3]. Thus, there is a direct connection between the positive emotions of a person who sees, uses, or simply possesses a product and the degree to which that product satisfies the person's needs [4].

2. Current Status

The first well-structured approach to systematizing human needs was proposed by Abraham Maslow [5]. Maslow's typology has enjoyed immense success in the academic world. Despite being 80 years since its publication, some specialists still use it, and an academic aggregator like Google Scholar records nearly 50,000 citations of his work (at the time this article was written). However, there are specialists in the field who contest the viability of this typology for several reasons. The first reason relates to the hierarchical structuring of needs, suggesting that individuals must first fulfil the needs at one level of the hierarchy before moving on to satisfy the needs at the next level. The second reason concerns the low granularity of the typology, as Maslow's typology contains only eight fundamental needs. There are also other criticisms raised against this typology. Nonetheless, it is indisputable that Maslow made two important contributions to the study of human needs. The first contribution is the consideration of human needs as universal, meaning that all individuals have the same fundamental needs regardless of gender, age, race, culture, etc. The second contribution is the observation that meeting these needs significantly contributes to an individual's well-being. [6]

Indeed, a multitude of researchers have introduced various typologies. In addition to developing new typologies, some researchers have applied and analyzed Maslow's typology [7, 8, 9, 10, 11], while others have compared it to alternative typologies [12]. Furthermore, the consistency of a typology of needs has been analyzed in times of peace and in times of war [13]. One of the most unique criticisms directed at Maslow's hierarchy is that it fails to explain the tremendous success of social media networks [14].

The emergence of numerous typologies has raised the issue of their validity. An important step in evaluating typologies was taken by Baumaster and Leary [15] who proposed five criteria for identifying truly fundamental needs:

1. *A need is considered fundamental when it is universal, it applies to all people, transcending cultural boundaries.*
2. *A need is considered fundamental if it is not derived from another need.*
3. *A need is considered fundamental if leads to (physical or mental) well-being (that goes beyond momentary pleasure) when fulfilled, and to pathology (medical, psychological, or behaviour) when unsatisfied.*
4. *A need is considered fundamental if it motivates behaviour in a wide variety of situations (not only in specific situations).*
5. *A need is considered fundamental if affects a wide and diverse assortment of behaviours.*

Desmet and Fokkinga [6] analyzed various typologies and found that only five typologies meet the requirements. These typologies are: self-determination theory [16]; well-being factor typology [17], taxonomy of fundamental human goals [18], determinants of well-being typology [19] and typology of human values [20]. Then, Desmet & Fokkinga [6] applied the assessment criteria for a typology, which are:

1. Inclusion (all types cover the entire concept)
2. Distinction (each type represents a unique area of the concept)
3. Equivalence (all types have the same level of abstraction and specificity)
4. Granularity (high = many types with few elements included)

They were not satisfied with the results and developed and tested their own typology of needs focused on product design [6], which is presented below and consists of 13 fundamental needs and 53 sub-needs.

Indeed, a series of questions arise that researchers may ask themselves. Is Maslow's typology truly outdated, considering its continued successful application? Is the idea of hierarchy of needs inherently flawed? Could academic pressure to publish numerous works and the requirement of scientific journals to publish only novel aspects at any cost, making authors propose new typologies of human needs?

3. The two typologies of needs examined in the research

The hierarchical typology proposed by Abraham Maslow [5] includes 8 needs, which are as follows (accompanied by a brief description):

- **Physiological Needs:** These are the basic biological needs for survival, such as food, water, shelter, and sleep.
- **Security Needs:** These include the need for security, stability, and protection from physical or psychological harm.
- **Love and Belongingness Needs:** These involve the need for social interaction, love, affection, and a sense of belonging in relationships and communities.
- **Esteem Needs:** These refer to the need for self-esteem, recognition, respect, and a sense of accomplishment.
- **Cognitive Needs:** These encompass the need for knowledge, understanding, and meaning in life.
- **Aesthetic Needs:** These involve the need for beauty, creativity, and appreciation of art, music, and nature.
- **Self-Actualization Needs:** This represents the need for personal growth, self-fulfillment, and reaching one's fullest potential.

- **Transcendence Needs:** These needs relate to the desire for spiritual growth, connection with something greater than oneself, and contributing to the well-being of others. (*This need won't be analyzed in this paper.*)

The Desmet-Fokkinga typology [6] includes the following needs:

- **Autonomy Need:** This refers to the need to be "the cause of your actions and feel that you can do things in your own way".
- **Beauty Need:** This is identical to the aesthetic need in Maslow's typology.
- **Comfort Need:** This pertains to the need to "have an easy, simple, relaxing life rather than facing difficulties or overstimulation".
- **Community Need:** This refers to the need to "be part of and accepted by a social group or other social entity that is important to you".
- **Competence Need:** This relates to the need to "have control over your environment and yourself, to be able to exercise your skills to solve problems rather than feeling incompetent or inefficient".
- **Fitness Need:** This encompasses the need to "have a strong, healthy, and energized body rather than having a sick, weakened, or apathetic body".
- **Impact Need:** This refers to the need to "see that your actions or ideas have an impact on the world and that you make a contribution, rather than feeling that you have no influence and no contribution".
- **Morality Need:** This pertains to the need to "feel that the world is a moral place and that you are capable of acting in accordance with your personal values, rather than feeling that the world is immoral and your actions conflict with your values".
- **Purpose Need:** This relates to "having a clear idea of what makes your life valuable".
- **Recognition Need:** This relates to the need to "receive appreciation for what you do and respect for who you are, rather than being disrespected, underappreciated, or ignored."
- **Relatedness Need:** This refers to the need to "maintain warm, close, and trusting relationships with people you care about, rather than suffering from isolation or being unable to make personal connections".
- **Security Need:** This is identical to the need in Maslow's typology.
- **Stimulation Need:** This encompasses the need to be "mentally and physically stimulated by new, varied, and relevant impulses and stimuli, rather than feeling bored, indifferent, or apathetic".

4. Design of Experiment

The overall objective of the research was to compare the two typologies (Maslow and Desmet-Fokkinga). The research questions to be addressed through experimental research are as follows:

1. Which typology is superior in terms of clarity of need formulation ("clarity"), relevance of typology elements ("relevance"), and utility for designers?
2. Can the elements of the Desmet-Fokkinga typology be grouped and hierarchically organized in a similar manner to the Maslow typology?

The experiment relied on the use of an online managed electronic questionnaire. The questionnaire consisted of two sections. In the first section, participants were asked to evaluate on a 7-point Likert scale the clarity, relevance, and utility for designers of all elements from the Maslow and Desmet-Fokkinga typologies. Each need was described in one or two sentences, and the questions were as follows:

"How clear is the expression of this human need?"

"Do you consider this to be a genuine human need?"

"How useful is knowledge of this need for a product designer?"

In the second part of the questionnaire, each participant was asked to evaluate on a 7-point Likert scale the importance of the needs from the Desmet-Fokkinga typology in terms of their contribution to their own happiness.

5. Experiment Results

The experiment was conducted with 108 participants (66 females and 42 males). The average age was 22,8 years ($\sigma = 2.77$). All participants were students enrolled at a major technical university in Romania. The participants had a basic background in product aesthetics. The accuracy of the results was tested using the Z-score. No Z-scores were outside the range of $[-3; +3]$, so no data sets were excluded. The Z-score ranged from -2.6 to 1.71. The data reliability was tested using the Cronbach's alpha coefficient. The calculated value for the complete dataset was $\alpha = 0.953$, indicating a high level of reliability. It is worth noting that 92.59% of the participants reported having knowledge about "Maslow's hierarchy of needs."

In Table 1, the results regarding the clarity of expression, relevance, and utility of the needs for designers are presented. Table 2 shows the overall means for the two typologies. It can be observed that Maslow's typology has higher means for all the considered indicators. The statistics of the responses to the requirement "Indicate the importance of satisfying each need for your personal happiness" are presented in Table 3 (only for the needs from Desmet-Fokkinga's typology).

Table 1. Evaluation of the needs of the two typologies

Need	Clarity	Relevance	Utility for designers
<i>Maslow Typology</i>			
Psychological Needs	6.71	6.69	6.11
Esteem Needs	6.46	6.00	5.57
Cognitive Needs	6.31	5.81	5.77
Self-Actualization Needs	6.31	5.72	5.34
<i>Common needs to both typologies</i>			
Security Need	6.48	6.44	6.03
Love and Belongingness Need	6.62	6.40	5.47
Aesthetic (Beauty) Need	6.33	5.33	5.75
<i>Desmet-Fokkinga Typology</i>			
Autonomy Need	6.02	5.55	5.27
Comfort Need	6.29	5.56	5.57
Competence Need	6.24	5.76	5.37
Fitness Need	6.46	6.27	5.28
Impact Need	5.98	4.77	4.94
Morality Need	6.06	5.42	4.77
Purpose Need	6.35	6.01	5.31
Recognition Need	6.39	5.60	5.15
Relatedness Need	6.46	6.07	5.31
Stimulation Need	6.09	5.60	5.29

Table 2. Comparison between Maslow and Desmet-Fokkinga Typology

Typology	Clarity	Relevance	Utility for designer
Maslow Typology	6.46	6.06	5.72
Desmet-Fokkinga Typology	6.23	5.66	5.23

Table 3. The importance of meeting needs for personal happiness

Need	Importance
Security Need	6,54
Competence Need	6,35
Purpose Need	6,22

Need	Importance
Fitness Need	6.08
Morality Need	6.08
Relatedness Need	5.95
Comfort Need	5.89
Autonomy Need	5.86
Stimulation Need	5.85
Community Need	5.63
Recognition Need	5.60
Beauty Need	5.48
Impact Need	4.72

The first position in this ranking of perceived importance of needs is occupied by the need for safety, followed by the next need at a certain distance. The following two positions are occupied by needs that can be associated with professional life, which is justified by the fact that the participants in the experiment were students. The need for physical fitness seems to have reached the next position from the perspective of medical safety. The "emotional" needs (such as closeness and social belonging) are placed lower in the list than expected if their position in Maslow's hierarchy were considered. Surprisingly, the penultimate position belongs to the aesthetic need, considering that the participants have a certain aesthetic education. By being ranked last and with a considerable distance from the preceding need, the "need to have an impact on the world" is revealed to be insignificant for the Romanian population. We do not question that Desmet and Fokkinga discovered that this need is relevant for the Dutch population, which means that the need is not universal.

The Pearson correlations between similar meaning elements from the two typologies were calculated. Significant correlations (though not strong) were identified only between the following elements (based on the relevance criterion):

$$r(\text{„Self-Actualization Need“}; \text{„Impact Need“}) = 0.64$$

$$r(\text{„Cognitive Need“}; \text{„Competence Need“}) = 0.62$$

$$r(\text{„Self-Actualization Need“}; \text{„Competence Need“}) = 0.58$$

Based on the fact that only three correlations were found between similar-meaning elements, and these correlations were only of moderate strength, it can be concluded that the two typologies are somewhat equivalent.

Regarding the potential groupings in the Desmet-Fokkinga typology, it can be observed that the elements of the Desmet-Fokkinga typology are placed within a range of 1 (except for the last element). However, no clear groupings between similar-meaning elements are apparent. For example, the difference between "the need for physical fitness" and "the need for comfort" is 0.2 (20% of the range), and the difference between "the need for competence" and "the need for stimulation" is 0.5 (50%).

Comparing the hierarchy in Maslow's pyramid and Desmet-Fokkinga typology, it can be observed that in both typologies, "the need for safety" holds an important position. However, the subsequent elements are those associated with knowledge ("the need for competence," "the need for purpose") and respect ("the need for morality"), while the elements associated with closeness and social belonging are placed before them in Maslow's pyramid. Therefore, the Desmet-Fokkinga typology does not allow for clear groupings and hierarchies, and the validity of Maslow's pyramid is questionable.

6. Conclusions

Based on the results presented in the previous chapter, clear answers were obtained regarding the importance of needs in Maslow's typology compared to Desmet-Fokkinga's typology.

Looking at the values presented in Table 2, the needs in Maslow's typology are formulated more clearly, are more relevant to human needs, and are more useful for designers compared to the needs in Desmet-Fokkinga's typology. When comparing the clarity of needs formulation, it can be observed that Maslow's typology has a score only 0.23 higher, but in terms of "relevance" and "utility for designers,"

larger differences of 0.4 and 0.49 points were obtained between the two typologies, respectively. These results suggest that although the needs are understood in terms of their formulation by the participants, they do not consider the needs in Desmet-Fokkinga's typology as genuine human needs or believe that if a designer had information about these needs, they would help in the development of new products.

The needs presented in Maslow's typology are formulated in a general manner and practically represent human needs regardless of the studied group, while Desmet-Fokkinga's typology addresses only certain classes or groups.

7. References

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