MEANING OF PRODUCT MEANINGS
A CLASSIFICATION BASED ON THEORETICAL PERSPECTIVES

Engin KAPKIN, PhD
Anadolu University, Turkey
ekapkin@anadolu.edu.tr

Abstract
Product meanings may have many connotations depending on which theoretical perspective is hold. A considerable amount of research has been conducted on theories of psychological responses to products. However, less attention has been paid to relate product meanings to theoretical foundations of theories. Current study is an early attempt to classify product meanings according to their theoretical foundations of major theories (Affordance Theory, Product Semantics, Product Emotions) on the topic. Descriptions and definitions of product meanings that are introduced by these theories are explored. These descriptions and concepts are emerged in three broad categories of product meanings. Consequently, the classification based on theoretical perspectives can reduce complex nature and information of the topic and guide methodological strategies for design for meaning.

Keywords: product meanings, theoretical perspectives, affordances, product semantics, product emotions

Introduction
Products are no longer designed only for sustaining their physical durability (You & Chen, 2007). They are designed also for leading positive experiences that are resulted in meanings and emotions associated with the product. Hence, companies have recognized that positive experiences are key to the success of a product, while a negative experience guarantees dissatisfaction with a product (Kuniavsky, 2003). Whether the meaning is associated with positive or negative experience, it is evident that designers develop products in order to communicate through certain meanings and emotions to offer particular experience. As a result, physiological responses to products have become subject to research. Products have been expected to be functional. Hence, product experience and meanings have been associated with affordances and utilitarian features of the products (Gibson, 1977; Norman, 1990). However, it is not satisfactory or acceptable when a product is difficult to use (Jordan, 2000). Krippendorff (1989a) states, “The slogan ‘form follows function’ thus implies abstracting the ordinary user out of the equation and discarding the meanings that users construct and see”. According to Desmet and Hekkert (2007), product meanings along with aesthetics lead to an emotional experience of a product; and therefore, they are significant. Users should interact with the product over time, multiple exposures in order to build these experiences (Csikszentmihalyi & Eugene, 1981; Norman, 2004). There are many theories proposed to describe physiological responses to products. These suggestions have mostly focused on Affordance Theory (Gibson, 1977), the basic communication model of Product Semantics (Krippendorff & Butter, 1984), the Product Emotion model (Desmet & Hekkert, 2002) or sensorial product experiences. Studies founded on these theories investigates many aspects of product meanings and allocates diverse methodological approaches. However, the relationships between theoretical foundations and their concept of product meanings remain unclear. The current paper offers a brief review and analysis of the literature on theoretical perspectives of aforementioned theories and studies on the topic. It particularly focuses on descriptions and definitions of “product meaning” that each theory and study proposes. Consequently, the paper aims to classify product meanings according to associated theoretical foundations and it argues whether certain product meanings can be related to certain theories. First, the paper introduces a brief review on theoretical perspectives on perception study in next section where the evolution of perceptual theories are presented. Afterward, Affordance Theory, Product Semantics, Product Emotion Models are organized according to their theoretical foundations. Second, concepts of product meanings that these theories propose is explored. The last section introduces proposed classification and offers discussion on the topic.
A Brief Review of Theoretical Perspectives on Perception

Theoretical perspectives are deliberated according to their assumptions on the matters of human (in our case, user), environment (product) and their relationship (Guba & Lincoln, 1998; Patton, 1990, 2002). Therefore, it is essential to discuss the ontological, epistemological and methodological assumptions of theories perspectives in general. Guba and Lincoln (1998) frame the main ontological questions as: “What is the form and the nature of the reality and what is there that can be known about it?”. An epistemological question is stated as “What is the nature of the relationship between the knower or would-be knower and what can be known?”. The answer of epistemological question is constrained by the answer given to ontological question (Patton, 2002) and answers given to these two questions guide researchers to response methodological questions of “How can the inquirer go about finding out whatever he or she believes can be known?” in other words: “How should we study the world?” (Guba & Lincoln, 1998).

The debate between theoretical perspectives on the topic is rooted whether users’ response to environment is an innate biological inheritance that is based upon our ability to adapt to environment for survival, or it is a result of our cognitive abilities, social interactions and cultural context (Crozier, 1994). Theories seeking the reality from physical environment and its qualities, suggest that our psychological responses are an innate reactions and behaviors driven by the environment. These perspectives are generally inherited from Cartesian tradition and have a sharp distinction between “the world” and “the mind” (Heft, 2003). However, according to Heft (2005), the sharp separation between “the mind” and “the world” limits our capabilities to convey qualities of cognitive experiences. Correspondingly, Patton (2002) holds a constructivist approach and proposes that our understanding is influenced by the context and developed through the interaction among people; therefore, there is not a stable and individual reality. There are attempts to bridge the gap between “the mind” and “the world”. Morgan and Smircich (1980) proposes a continuum scale of theoretical perspectives in which they represent the debates between “objective” and “subjective” approaches in terms of their ontological, epistemological and methodological assumptions (see Table 1). According to them, “objective form of knowledge that specifies the precise nature of laws, regularities, and relationships among phenomena measured in terms of facts” whereas “subjectivist view of reality is a projection of individual imagination and it emphasizes the importance of understanding the processes through which human beings concretize their relationship to their world”. Although Morgan and Smircich (1980) outline ontological and epistemological differences between perspectives, they avoid directly associating methodological approaches to theoretical perspectives since research methods might have diverse applications among different theoretical perspectives.

As the continuum is observed from left to right epistemology shifts from closed mechanic conception of the world to an open system, a living organism (Morgan & Smircich, 1980). Van Rompay (2008) on the other hand investigates Gestalt school of thought -the whole is more than the sum of its parts- studies of Arnhem (1974, 1977), Koffka (1935), Dewey (1934), Merleau-Ponty (1962) and emphasizes the importance of interaction between perspectives where the emphasis on “object” and “subject” is equally significant. Correspondingly, Almquist and Lupton (2010) suggest a common ground – an interaction– between objectivist and subjectivist approaches. The separation is also observed in the field of sensation and perception. A “bottom-up” perceptual approach indicates that physical qualities of the environment drive the perception. In this case, perception is the information that the world contains and therefore it is the source of knowledge. A “top-down” perceptual approach, on the other hand, advocates that the source of the knowledge is our ability to interpret and construct the world. This approach suggests involvement of high-level cognitive processes such as memory, knowledge, experience, analyses, synthesis and evaluation in order to establish perception (Coren, et.al. 2004; Goldstein, 2009; Sternberg, 2008). Consequently, in one hand knowledge is seen as a concrete structure and the information that environment or products contain in which users can only response to (the world-based, objective or bottom-up approach); on the other hand the source of the knowledge is a projection of human mind (the mind-based, subjective or top-down approach). Current study prefers using terms “bottom-up” and “top-down” due to their inclusive definitions and acceptance in perception studies.
Several theories have proposed to describe psychological responses to environment or products in design literature. Prospect and Refuge Theory by Appleton (1975) suggests that environment provide significant opportunities for the user who cannot consciously observe them. Main promise of this theory is that the user is a consciousness being who has innate skills to make sense of what environment offers (such as when finding a safe place to sleep or hide). Gibson (1977) defines these opportunities as affordances. According to his Affordance Theory, also known as direct perception or ecological approach, the user analyzes cues in the environment or on the product in order to relate, compare and find relationships between other products or environmental elements. Even though the stimulus on the receptors changes, there are invariant and stable qualities of the environment such as physical size, form or distance. These qualities are called affordances “…action possibilities afforded or available to observer…” (Coren et al., 2004). Affordances are the features meaningful for the user even though these features are not directly related to the user or a product but more affiliated to the relationship between them (Heft, 1988). Norman (1990) associates affordances with “fundamental properties (of products) that determine just how the thing could possibly be used”. According to him, affordance of a product should match with the function of the product and the feedback it affords to provide. Consequently, affordances are fundamental information that products contain and therefore the theory might be considered under bottom-up approach and fit under objectivist end of the continuum scale (see Table 1).

The debate opposing bottom-up theories is formed around that they lack explanation on the effects of context, expectations, knowledge, and prior experience of users. In order to accommodate the complexity, theories evolve. Semantic features of products have been studied by many researchers (Blaich, 1982; Butter, 2012; Demirbilek & Sener, 2003; Hsiao & Chen, 1997; Krippendorff & Butter, 1984; Krippendorff, 1989; You & Chen, 2007). Krippendorff and Butter (1984) and Monó (1997) apply Shannon’s (1948) Basic Model of Communication to design theory and describe meaning attribution process during the design process. Krippendorff and Butter (1984) define Product Semantics as, “…a study of the symbolic qualities of man-made forms in the cognitive and social contexts of their use and the application of the knowledge gained to objects of industrial design”. According to Buchanan (1993) product semantics is a concept that associates symbolic meanings of products to their use in context. It is an ability for a product to self-explain itself. Product Semantics includes designer as a product form generator and meaning attributer, product form as a medium that carries a meaning or a message, and the user as a receiver of the embedded meaning. Product Semantics suggest that users’ context and cognitive abilities are as significant as the product’s physical qualities. However, Krippendorff (1989) defines meaning attribution process as a cognitive effort and a product of the context: “…meaning is a cognitively constructed relationship. It selectively connects features of an object and features of its context into a coherent unity”. Product Semantics consider symbolic qualities of products in diverse contextual conditions. In

<table>
<thead>
<tr>
<th>Core Ontological Questions</th>
<th>Objectivist Approach</th>
<th>Subjectivist Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reality as a concrete structure</td>
<td>Reality as a contextual field of information</td>
<td>Reality as a social construction</td>
</tr>
<tr>
<td>Man as a responder</td>
<td>Man as an information processor</td>
<td>Man as a social constructor, the symbol creator</td>
</tr>
<tr>
<td>To construct a positivist science</td>
<td>To map contexts</td>
<td>To obtain phenomenologic al insights</td>
</tr>
<tr>
<td>Lab experiments, surveys</td>
<td>Historical analysis</td>
<td>Symbolic analysis</td>
</tr>
<tr>
<td>Table 1. Objectivist and subjectivist debates and network of basic assumptions: the continuum scale</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Morgan and Smircich (1980)
this case, concept of meaning refers to many connotations depending on the context of use (operational-context), user-user interaction (socio-linguistic context), interaction between developers of a product (context of genesis), and technological influence (ecological context) (Krippendorff, 1989). Correspondingly, Monó (1997) mentions four semantic functions of products. First, a product should “describe” its purpose, the way it functions and is used. Second, a product should “express” its value and character, then it should “exhort” users to react in a specific way. At last, a product should “identify” it is origins, category, and personality. Product Semantics can be considered a bottom-up approach since it values affordances and physical qualities of products. It can be also considered under top-down approaches since it also considers influences of social context and human cognition. Studies under Product Semantics can be then placed at middle area on Morgan and Smircich’s (1980) continuum scale.

Developments in the fields of cognitive sciences and cognition has received favorable attention in design fields. Sanders (1992) proposes that products should be first designed based on certain needs (usefulness), then user should understand how to use the product easily (usability), and last user should desire to own and use the product (desirability). According to Jordan (2000), users profits from products in three levels: practical, hedonic and emotional benefits. A large body of research is framed around Model of Product Emotion by Desmet and Hekkert (2002). The Model of Product Emotion suggest that product is an appealing object which user can like or dislike. Emotional reactions towards to products are appraising and evaluative processes where users’ concerns matters. If concerns and the product features matches, then the user may most likely love the product (Desmet, 2003). According to this approach, meaning is the source of an emotion (Schifferstein, 2010). Many advocates that concept of product meaning is a result of pleasurable and satisfying usability experience (Desmet & Hekkert, 2002; Jordan & Macdonald, 1998; Jordan, 2000; Tractinsky, 1997). Graumann (1974) indicates phenomenological aspects of meaning attribution and advocates that a product may have diverse meanings over a time even though it stays as the same product. This exposes the complexity of meanings and meaning attribution processes. As a result, studies related to Product Emotions can be positioned more close to subjectivist end of the continuum scale as a top-down approach.

Complex and inclusive theories are generated to provide a holistic view on product-human interaction and meaning attribution. Norman (2004) offers three levels of interaction that defines users’ psychological responses to products: Visceral, behavioral, and reflective. Initial reactions to physical qualities and sensorial experiences occurs at the visceral level at first sight of the product. The satisfaction of effective use, performance and high usability appears at the behavioral level in which the user actually interacts with a product in relatively long time. The pleasure of the total experience of a product reveals at the reflective level when the user keeps a product and uses it over a time. Similar to Norman’s approach, Crilly, et.al. (2004) suggests behavioral, cognitive and affective responses to products; Cupchik (1999) proposes sensorial/aesthetic, behavioral/cognitive and personal-symbolic responses; and Baxter (1995) indicates intrinsic, semantic and symbolic responses to products. It can be inferred from these studies that product meanings reveal at each and every level of interaction. Each and every level of responses may then lead to different connotations of product meanings; and therefore, studies that are founded on these theories should cover multiple stands of the continuum scale and hold interactionist view.

### Concepts of Product Meanings

There are diverse approaches on the concept and the definition of “meaning”. According to Osgood et al. (1957), meaning may refer to relationship between signs and situations in sociological disciplines, or it may indicate relationships between different signs or significates in linguistic. Crozier (1994) defines meaning as mental organizations of schemas, where schemas are “coherent units of structured representations of environmental regularities”. Considering “product meanings” there is no clear concept or universally accepted definition.

The concept of meaning hold by the Affordance Theory generally refers to functional and actionable qualities of products (You & Chen, 2003). In this case meaning is the information that product contains and expresses to its
users and environment. Similarly, according to Norman (1990), meaning is the intuition that a product form expresses its function and use. Heft (2003) describes, “What is perceived through the pick up of information is the affordance of the environment... A surface that is positioned approximately at knee-height relative to a particular person’s leg length is perceived to be sit-on-able; it affords sitting on”.

Product meanings might also be generated through sensorial experiences. Dagman et al. (2010) proposes “haptic product properties” which is a list of nouns based on studies of Heller and Schiff (1991) and Klatzky and Lederman (2012). Cutting and Vishton (1995) indicate that proximity to a product has an effect on detection of cues and information –meaning–. Correspondingly, Heller (1982) and Schifferstein (2006) propose that involvement sense types depends on the information seeking from the product. Thus, Xenakis and Amellos (2013) advocate when the user realizes a product at first an aesthetic judgment is performed through vision; then haptic interaction occurs when touched; and at last evaluation of affordances and semantics are made. In this case, each phase may reveal meanings accordingly.

Csikszentmihalyi and Eugene (1981) categorizes meanings in two main groups: person and non-person. There are four sub-categories under person type meanings: self, immediate family, kin and non-family; and there are two sub-categories under non-person meanings: past and present/future related meanings. The past related meanings include those which emerged from memories and associations whereas present/future refers to meanings that are revealed from experiences, intrinsic qualities, style, utilitarian features and personal values. Kujala and Nurkka (2012) mentions three categories of meanings. Personalized meanings includes terms such as motivator, supporter; utility meanings are related to usability of the product; and tool meanings refer to technical features of the product. Schifferstein (2010) proposes multiple layers of product meanings. The foundation layer comprises affordances and physical qualities of the product which establishes an identity and potential use. The second layer includes meanings generated by symbolic associations. At this level branding, values of the producer, and the context drives meanings. At the highest level, cultural values shape the meaning of the product. This approach resembles Krippendorff’s (1989) contextual descriptions (operational-context, socio-linguistic context, context of genesis and ecological context) and Monò’s (1997) semantic functions of products (describe, express, exhort, identify). In addition, Krippendorff (2006) offers a linguistic classification of meanings in five categories: objective and measurable qualities such as weight or color; interface qualities are the ones that help product to be reliable and used easily; evaluative and aesthetic qualities can be elegance and harmony; meanings refer to social status and positions such as universality or modernity; and emotional qualities are the terms such as satisfying and fun. Furthermore, product meanings might be reflection of personality of users. Many studies illustrate that preference of a product is associated with a match between personality of the users –self– and the identity or the brand value of the product (Belk, 1988; Malhotra, 1988). Personality terms then also appears as product meanings.

There is no clear differentiation between product emotions and product meanings in the literature. According to Desmet and Hekkert (2007) product emotions and meaning may not be separable. A comprehensive study by Desmet (2012) introduces a general typology of positive product emotions. These are sets of meanings revealed by users during their interaction with products. Desmet (2012) suggest that there are six sources of positive product emotions: object refers to emotions elicited by physical qualities of products; meanings indicates associations that users can make with the products; interaction are the emotion that are elicited during the usage of the product; activity is the emotional experiences that product facilitates; self is the emotions that are experienced in response to user’s self-being; and last, other types includes emotions where a product becomes a medium for inter-personal relationships.

**Discussions**

Current study presents a brief introduction to theoretical perspectives, and it explores their stand on the concept and definition of product meaning. At first, a sharp distinction between the matters of world (objectivist or bottom-up) and the mind (subjectivist or top-down) are presented. A continuum scale that gradually bridges the distinction is introduced. An interactionist approach, which advocates an overlap between matters of the world
and mind, is addressed. Subsequently, major theories (Affordance Theory, Product Semantics and Product Emotions) in the field of perception and design is introduced and their theoretical stands are discussed. Due to their stands on the source of knowledge, Affordance Theory is organized under bottom-up approaches, Product Semantics are placed at the intersection between bottom-up and top-down approaches and Product Emotions are found under top-down approaches (see Figure 1 first row). Afterwards, concepts of product meanings for each aforementioned theory, are introduced and complementary concepts of meaning are discovered.

Descriptions and definitions of concepts of product meanings is used to classify product meanings according to theoretical perspectives (see Figure 1 second row).

Product meanings that are revealed by or for affordances, functionality or utilitarian features is considered as level one meanings (see Figure 1 second row, first column). Level one meanings are fundamental and structure-related. They are associated with information that product contains that give them their high level categorical names (if sit-on-able then it is a chair like object). Some meanings that are resulted in sensorial experiences can also be considered level one meanings. Studies interested in these category of meanings may benefit from bottom-up approaches. Level one meanings may reveal at Norman’s visceral level, or as Cupchik’s sensorial, Baxter’s intrinsic response. Level one meanings may overlap with level two meanings that are found more related to usability and experiences gained at first sight (see Figure 1 second row, second column). Level two meanings refer how well the product informs the user about itself and its functions in certain context. This class of meanings are solution specific and can be related to style (modern office chair). A product should achieve to have level one meaning to gain level two meanings. At this level, meanings may be resulted at Norman’s behavioral level, or Cupchik’s cognitive, Baxter’s semantic response. An interactionist stand may help studies interested in level two studies. Meanings at level three may be the result of prolonged interactions (see Figure 1 second row, third column). The user is most likely to allocate sensorial mechanisms, find the product attractive (appearance), has long exposure of use, and then consider to remember (memorable) the product in order to assign level three meanings to the product. Level three meanings may also be revealed spontaneously when there is a match between the self-image or values of the user and the product. Level three meanings may refer to cultural values or social status. Furthermore, this category of meanings can be assigned to products due to a key memory of another person or an event. Norman’s reflective level, Cupchik’s personal, or Baxter’s symbolic responses can evoke level three meanings. Bottom-up approaches may be beneficial to understand reasoning behind level three meanings.

To illustrate, a product may trigger sensorial mechanisms and the collected information becomes sources of meanings at first sight. When the experience is extensively gained the surface might be found “comfortable”. Thus, the meaning evolves and becomes more definitive about the surface and the experience gained. At the sensorial processing, the surface may be detected as “soft” and “rounded” that is maybe why it feels comfortable. If the overall or final experience is satisfactory and fun, then the surface maybe is “pleasurable” and “liked”. Eventually, the surface is sit-on-able, soft, comfortable and fun. If the surface is formed surprisingly strange and unique then it maybe is elegant. In this illustration, several theories have potential applications explaining meaning attribution processes. The illustration is initiated with an affordance. The surface is at the knee level, flat and it affords sitting on and meanings revealed are at level one. Nonetheless, cues on the surface (soft and rounded) suggest that it is potentially comfortable. The user most likely had experienced the same surface qualities before and recalls prior experience. Meanings resulted in this interaction may be at level two. When the surface is used, the experience is found pleasurable since it matches with expectations. At this point, a comparison and appraising occurs. The surface is liked and found fun to sit. Furthermore, when all accumulates, and the surface form is found unique or it matches with self-image of the user, then the surface might be found as “loved” or “elegant” for the particular user. Thus, these meanings may be at level three in which phenomenology might account for an explanation.

Current study is an early attempt to classify product meanings according to theoretical perspectives. A broad classification of product meanings has benefits two benefits. First, it reduces complex nature of the topic and may help increasing our knowledge on the topic. Second, proposed classification illustrates the relationship between product meanings and associated theoretical perspectives which may guide methodological strategies.
Although product meanings are previously itemized by many researchers (Dagman et al., 2010; P. Desmet, 2012; Karana & Hekkert, 2010; Karana, Weelderen, & Woerden, 2007; Krippendorff, 2006) and roughly categorized in this paper, further studies are needed for more sensitive identification and precise classification.

Figure 1. Classification of product meanings and associated theoretical perspectives.
References


