

# THE RELEVANCE OF AFFORDANCE IN THE DESIGN TODAY AND IN THE FUTURE

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## ABSTRACT:

Naturally occurring interaction between the user and the product provided through “affordance” also known as “direct perception” when handling a product is one of the key factors that is needed to be considered when designing our everyday products. This paper states that the everyday products are evolving into a diverse range compared to when they were first being introduced on the market.

This study focuses on analyzing how the products have developed from its early days and its relation to the “affordance” perspective according to the assessment criteria which appear later in this paper. Through evaluating the certain examples case by case and seeing the relevance of affordance in the designs of the present society, this study aims to see its importance in design and how it can further help improve the relation between user and the product in this creative society.

Keywords: affordance, direct perception, active memory

## I. BACKGROUND

The society today is continuously producing a diverse range of products out on the market that has the same functions. As time goes on with the constantly increasing functions based on the advancing technology, many of these product's numerous functions are bound to be nonexistent to the consumers because they are difficult to use or the functions are simply invisible to the users' eyes.

This is why even today Gibson's theory of direct perception also known as the 'ecological psychology', in the functionality aspects of a product is one of the key factors being considered as one of the major design elements. In particular, it is clearly visible that providing users with a new experience through embodied interaction is essential in today's society.

Naoto Fukasawa is currently one of the world's most renowned designers who deal greatly with 'affordance' and claims it is one of his design philosophies. Fukasawa is highly acclaimed for his innovative designs of familiar everyday objects, which are based on his close observations of how we use things in our everyday lives.

The purpose of this study is to find the relevance of the original meaning of 'affordance' in Naoto Fukasawa's and pursuit of affordance and analyze how it is diverging.

This study involves literature review on the various definitions of 'affordance' from as early as 1966 when Gibson first coined the term followed by Norman and other after that. Also through a case-by-case study on a few of Fukasawa's designs and exploring the new definition of affordance in design along with other additional elements, a distinct divergence was able to be seen.

## 2. AFFORDANCE IN CONTEXT

### 2. 1. AFFORDANCE IN THEORY

Ecological psychologist Gibson (1966) coined the term "affordance" as part of his direct perception theory to denote the usability value of environmental objects taken with reference to the intrinsic physical

features of an organism. Underlying this concept, Gibson <sup>1</sup> (1979) claimed “The object offers what it does because it is what it is”; hence, Gibson created this term in order to stress the reciprocal relationships between environment and an organism rather than what an organism perceives about the environment.

However Gibson’s theory of affordance deviated when Norman’s <sup>2</sup> (1988) theory brought out the meaning of enhancing the visibility and the usability of a product. Many designers in the field understood it as a visual cue that indicated an emphasis on the required operations or the intended functions of a product.

It was in 1988 when Donald Norman’s book *The Psychology of Everyday Things* came out referring to the term affordance as “a term referred to the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used.” He further stated “Affordances provide strong clues to the operation of things.”

As a cognitive scientist, Norman’s viewpoint on perception conflicted with Gibson’s theory. Norman believes that affordance result from users’ mental interpretation of things based on the individuals present knowledge and experience regardless of whether the affordance actually exists or not. On the other hand, affordance described by Gibson, is the possibility of the action with relations to the physical condition of the user.

As the theory of affordance spread and became generally prevalent, some refinements and formalizations were made by other ecological psychologists. Among them were Turvey <sup>3</sup> (1992), who suggested that affordances are animal-relative properties of the environment that has significance to animals’ actions. While Chemero <sup>4</sup> (2003) argued that affordances are not properties of the environment, but are relations between animals and features of the environment. In both discourses, it is clear that affordances cannot exist in the absence of animal or environment.

The most generalized concept of affordance is adopted in this study which is that affordance exists in a three-way relationship between animal, environment and action.

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<sup>1</sup> Gibson, J (1979) *The ecological approach to visual perception*; Houghton Mifflin Company, Boston, MA

<sup>2</sup> Norman, D A (1988) *The psychology of everyday thing*; Basic Books Inc., New York, NY, USA

<sup>3</sup> Turvey, M T (1992) Affordances and prospective control: an outline of the ontology; *Ecological Psychology* Vol. 4 Issue 3 pp 173-187

<sup>4</sup> Chemero, A (2003) An outline of a the1992) Affordances and prospective control: an outline of the ontology; *Ecological Psychology* Vol 4 Issue 3 pp 173ory of affordances; *Ecological Psychology* Vol. 15 Issue 2 pp 181-195

## 2. 2. AFFORDANCE IN DESIGN

Placing the affordance term into the context of industrial design, affordance can be defined as a three-way relationship among users (animal), objects (environment), and actions (action) (see figure 1). Thus affordance is regarded as the potentiality of a product that can support user action without requiring users' memory, inference, and further interpretation. Through this notion designers are able to focus on the users' action rather than their minds, which open to new potentials in the design practice connecting to the users experience. For example, through interacting with the products, users can activate a sequence of possible actions automatically in order to achieve their tasks in the end. Therefore, designers should pay attention to the meaningful concepts regarding interactions between the products and the users rather than only concentrating on the abstract form.

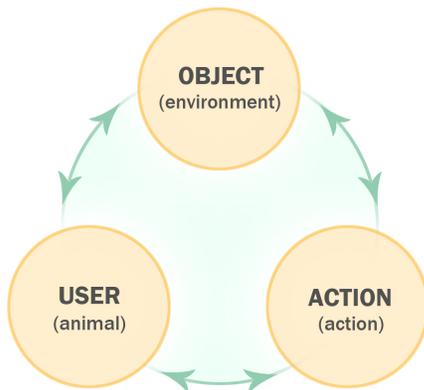


Figure 1 The three-way relationship of Affordance

Crilly, Moultrie and Clarkson (2004) point out that the culture, background and experiences of the consumer are influential in determining their response to products. The designers and consumers of a certain product are often separated by time, place or social group. As such, the context of consumption within which the consumer operates is an important consideration. It is within this context that the design message is delivered to the user creating interaction. (See Figure 2) <sup>5</sup>.

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<sup>5</sup> Crilly, Moultrie and Clarkson (2004) Seeing things: consumer response to the visual domain in the product design; Cambridge, UK

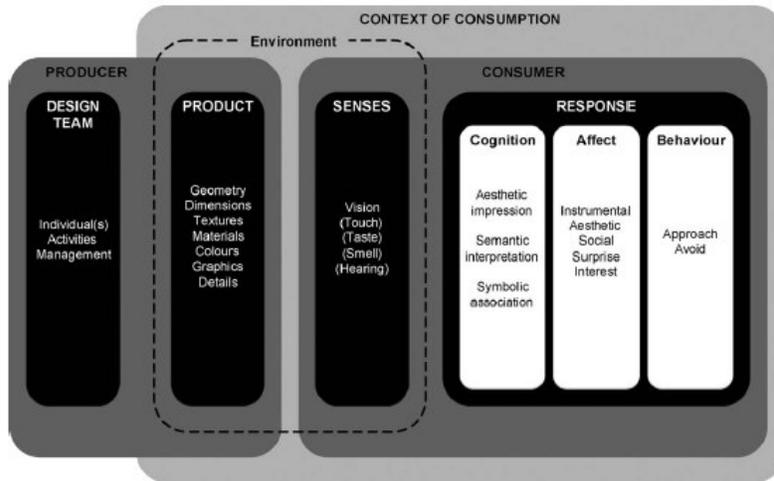


Figure 2 Expanded frameworks for design as a process of communication (Crilly, Moultrie and Clarkson 2004)

Through verifying figure 1 and 2, the principles of the three-way relationships were able to be clarified.

The relation between User and Object is the environment area indicated with dotted lines in Figure 2 which deals with the way the consumer acknowledges the presence of the product according to the 5 senses: vision, touch, taste, smell and hearing.

The User and Action relationship in figure 1 is defined by the cognitive judgments made by the user to do with the product, based on the information perceived through the senses. Cognitive response to the product has formally been divided into 3 characteristics by Crozier <sup>6</sup>, Cupchik <sup>7</sup>, Lewalski <sup>8</sup>, Baxter <sup>9</sup> and Norman <sup>10</sup> which are aesthetic impression, semantic interpretation and symbolic association. Aesthetic impression is defined as the sensation that results from the perception of attractiveness in the product. To inspire consumers to invest in a product, an eye catching aesthetic impression is an essentially fundamental

<sup>6</sup> Crozier, W R (1994) *Manufactured pleasures: psychological response to design* Manchester University Press, Manchester, UK

<sup>7</sup> Cupchik, G C (1999) *Emotion and industrial design: reconciling meanings and feelings* First International Conference on Design & Emotion Delft, The Netherlands pp 75–82

<sup>8</sup> Lewalski, Z M (1988) *Product esthetics: an interpretation for designers* Design & Development Engineering Press, Carson City, NV

<sup>9</sup> Baxter, M (1995) *Product design: a practical guide to systematic methods of new product development* Chapman & Hall, London, UK

<sup>10</sup> Norman, D (2004) *A Emotional design: why we love (or hate) everyday things* Basic Books, New York, NY

element to be endowed. Semantic interpretation defines what a product is trying to say in its function, mode-of-use and qualities. Symbolic association defines what a product is saying about the user who owns it: the personality and social significance related to the design.

The relation between Object and Action defines the consumers' psychological response to the semiotic content of the product. This three-way relation in the large context refers to the behavioral response which is the consumer's psychological response comprising cognition and affect and influences the way in which they behave towards the product.

In result to the analysis of the above two diagrams, an assessment criterion was created according to the characteristics of the relations between User, Object and Action.

Table 1. The 4 elements are the criteria to assess the characteristics of affordance

1. Senses	The product is received by the physiological senses. With regard to the perception of product form, vision is of primary importance. If consideration is to be given to other sensory aspects of design then touch, taste, smell and hearing all become significant. The complexities of perceptual psychology are not presented here; it is sufficient to state that our visual perception of objects may not be an accurate reflection of their physical state <sup>11</sup> (Hoffman, 1998).
2. Cognition	Cognitive response refers to the judgments that the consumer makes about the product based on the information perceived through the senses. These judgments include evaluation of the products perceived qualities.
3. Affect	A term to describe these emotions, moods and feelings. Affect has been described as part of 'the consumer's psychological response to the semiotic content of the product'.
4. Behavior	A consumer's psychological response influences the way in which they behave towards the product. Marketers frequently use the terms approach or avoid in order distinguishing between the behavioral responses of an interested and disinterested consumer.

<sup>11</sup> Hoffman, D D (1998) Visual intelligence: how we create what we see W.W. Norton & Company, New York, NY

### 3. REINTERPRETATION OF AFFORDANCE IN THE PRESENT SOCIETY

In order to find out how the

Three internationally renowned designers whose work emphasizes strongly on perceptive usability were chosen and analyzed based on their most popular products.

#### 3.1 NAOTO FUKASAWA'S AFFORDED VALUES

"I think that when people and things are within the boundaries of consciousness they are at their farthest from heaven."<sup>12</sup> (IDEO) – Naoto Fukasawa

Naoto Fukasawa's reinterpretation in designing for the everyday products comes from observing how people unconsciously handle material objects. His work takes its cues from the unconscious actions of everyday behavior, and the delight we feel when we see a familiar object with new eyes. Fukasawa's products are used naturally and spontaneously: without thought, which is what he is out to appeal.

Affordance in Fukasawa's term is "Active memory" which refers to the experience that only the body can remember, in other words, the memory of the unconsciousness. (Fukasawa, 2007)<sup>13</sup> Fukasawa mentions in his recent book that 'memory' in Japanese translates into remembrance and so accurately speaking it's not actually memory but more closer to nostalgia.

Fukasawa's most renown work is the wall-mounted CD player which he designer for Muji. He mentions that all computers and electronic appliance all look alike on the store displays and that so he wanted something different, something that as designed around their relationships with people and space, in the same way household furniture adapts to the shape of human bodies and the space around it. (See figure 3.)

Fukasawa's sole bag was designed in a nostalgic context where in Japan, students from elementary school through to high school all wear identical rubber-soled shoes indoors in relation to the custom of taking your shoes off when entering the room. So in designing a bag with the rubber-soled shoes on the bottom,

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<sup>12</sup> <http://www.ideo.com>

<sup>13</sup> Fukasawa (2007) Naoto Fukasawa; Phaidon Press Ltd, Hong Kong

provides users with memories of the past. And also having a shoe sole on the bottom of the bag perceives users to place the bag on the ground comfortably rather than sitting it on your lap.



Figure3. Muji CD Player by Naoto Fukasawa



Figure4. Sole bag by Naoto Fukasawa

### 3.2 JASPER MORRISON VIEW ON AFFORDANCE

“Super normal“. That was it, a name for what I have been trying to achieve all these years, a perfect summary of what design should be, now more than ever. – Jasper Morrison

According to Morrison <sup>14</sup>, design, which is supposed to be responsible for the man-made environment we all inhabit, seems to be polluting it instead. Its historic and idealistic goal to serve industry and the happy consuming masses at the same time, of conceiving things easier to make and better to live with, has been side-tracked.

Morrison pointed out that product design has moved from normal to over-done and in fact, a certain lack of noticeability, design that doesn't stand out too much, has become a critical requirement. There are better ways to design than putting a lot of effort into making something look special. Special is generally less useful than normal, and less rewarding in the long term.

<sup>14</sup> <http://www.jaspermorrison.com>

The super normal object that Jasper Morrison is emphasizing is the result of a long tradition of evolutionary advancement in the shape of everyday things, not attempting to break with the history of form but rather trying to summarize it. Morrison state that objects which are good to live with, seem to share certain characteristics and these characteristics has never been the result of aesthetic decisions alone, nor were they just purely functional. But they were always balanced with these two extremes with the additional consideration of the appropriateness of materials and their combination, of the human experience of using and living with the object, of the objects effect on its surroundings and of the communication of its purpose.



Figure5. Coffee maker 2004 by Japser Morrison

### 3.4 SIMPLIFYING DESIGN WITH INDUSTRIAL FACILITY <sup>15</sup>

A London Design company founded in 2002 by Sam Hecht and Kim Colin, has applied importance of design as a means of simplifying our lives in an inspirational way and has developed products and environments for companies such as Epson, Magis, Lexon and Whirlpool, as well as Muji where Hecht and Colin are the creative directors for Europe.

Cameron Campbell, design principal of the Ideation Studio at Herman Miller, describes the work at

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<sup>15</sup> <http://www.industrialfacility.com>

Industrial Facility as 'iconic' and 'civil'. Iconic design is about creating something that's very personal to a designer and with civility, true functionality is provided. Campbell adds "These two elements are extremely hard to achieve together, and there it's very rare to find designer who can actually achieve that unity of the opposites."

This XY Toaster designed for National was one of their leading designs which contain clear perceived characters. The easy-to-handle lid is lifted and turned over where there are plastic spikes to support the bread after it is being toasted. It's very straight forward usability which required not much thought.



Figure 6. XY Toaster for NATIONAL by Industrial Facility

### 3.4 EVALUATION OF AFFORDANCE

The following 4 products: Muji CD player, Phone, Umbrella, and Salt and pepper shakers are evaluated according to the 4 characteristics of affordance- Sense, cognition, affect and behavior which were verified in the previous chapter.

Product	Elements for affordance evaluation			
	senses	cognition	affect	behavior
	Fan	Pull cord	Use like a fan Minimal, calm	Approach
	Mobile Phone	Put down	Use like a brick Minimal, solid	Approach
	Umbrella	Umbrella stand	Stand anywhere	Approach
	Shakers	Hold and shake	Black for pepper and white for salt. Long stick for holding	Approach

From the evaluation of the 4 products, It can be seen that regardless of the fact that each of the items had very different functions from the original CD player, phone, umbrella and Salt and Pepper shakers, the function were directly able to be perceived and used without any difficulty. Therefore this case study can be related back to Fukasawa's term of 'Active Memory' where these functions, although they are new ideas, they are functions that don't need additional tuition to the user which can be stated that the body has in fact experienced it somewhere in different situations but in similar ways. This case study shows how important affordance is and the concepts can be afforded in a diverse range of ways.

#### 4. CONCLUSION

Affordance is becoming a greater key factor to consider in design. With products developing from the original into non-pleasant, over designed objects, it's important for designers to realize as Jasper Morrison pointed out that the less noticeability may be the key to improving our design standards in the future design society. It's through affordance that users will appreciate the product and grow more attached to it as time goes on.

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- Gibson, J (1979) *The ecological approach to visual perception*; Houghton Mifflin Company, Boston, MA, USA (p. 127)
- Norman, D A (1988) *The psychology of everyday thing*; Basic Books Inc., New York, NY, USA
- Turvey, M T (1992) *Affordances and prospective control: an outline of the ontology*; *Ecological Psychology* Vol. 4 Issue 3 pp 173-187
- Chemero, A (2003) *An outline of a theory of affordances*; *Ecological Psychology* Vol. 15 Issue 2 pp 181-195
- Crilly, N, Moultrie, J and Clarkson, J (2004) *Seeing things: consumer response to the visual domain in the product design*; Cambridge, UK
- Crozier, W R (1994) *Manufactured pleasures: psychological response to design* Manchester University Press, Manchester, UK
- Cupchik, G C (1999) *Emotion and industrial design: reconciling meanings and feelings* First International Conference on Design & Emotion Delft, The Netherlands pp 75–82
- Lewalski, Z M *Product esthetics: an interpretation for designers* Design & Development Engineering Press, Carson City, NV (1988)
- Baxter, M (1995) *Product design: a practical guide to systematic methods of new product development* Chapman & Hall, London, UK
- Norman, D A (2004) *Emotional design: why we love (or hate) everyday things* Basic Books, New York, NY
- Desmet, P (2003) 'A multilayered model of product emotions' *The Design Journal* Vol. 6 No 2 4–13
- Demirbilek, O and Sener, B(2003) 'Product design, semantics and emotional response' *Ergonomics* Vol. 46 No 13/14 pp1346–1360
- Hoffman, D D (1998) *Visual intelligence: how we create what we see* W.W. Norton & Company, New York, NY
- <http://www.ideo.com>
- Fukasawa (2007) *Naoto Fukasawa*; Phaidon Press Ltd, Hong Kong
- <http://www.jaspermorrison.com>
- <http://www.industrialfacility.com>