

Thesis for the Degree of Doctor of Philosophy in Kansei Science

An Investigation into the Cross-Cultural Differences of Aesthetic Value  
Cognition and Visio-Semantic Evaluation of Product Designs  
– Focus on Japan and Nigeria –

製品デザインに対する感性価値認識と視覚解釈的評価の比較文化的相違に関する研究  
ー日本とナイジェリアを事例としてー

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*To the loving memory of Omowumi Safa (1964-2003)*

*To the loving memory of the baby yet to be named*

*To my dear and loving parents, sibs and folks*

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Adelabu Oluwafemi Samuel  
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## **BIOGRAPHICAL SKETCH**

Oluwafemi Samuel Adelabu was born in Ibadan (South West Nigeria), as the ninth child in a family of ten. He attended the Industrial Design department at the Federal University of Technology, Akure (Nigeria), where he received his Master's degree in 2011 and worked as a graduate/ research Assistant beginning in 2009. He was awarded the Japanese Government Scholarship (Monbukagakusho) in 2011 to pursue his graduate studies in Japan. In April 2012, he began his doctoral program with the Graduate School of Comprehensive Human Sciences of the University of Tsukuba. His areas of study have expanded from a 'craft-based' industrial design to applying Kansei information science in the evaluation of cross-cultural product designs. During his doctoral studies, he co-founded *iGreenKraft*, an enterprise in Germany created for green product sales and development. He retains his position as a lecturer in the Department of Industrial Design at the Federal University of Technology, Akure. He is a member of the Ceramic Association of Nigeria (CerAN), the Japanese Society for the Science of Design (JSSD) and the Interaction Design Foundation (IDF).

## ABSTRACT (In English)

Based on psycho-cognitive theory, it is believed that the range of perception and degree of sensibility to an artifact might be influenced by a system of culturally engrained values. In other words, when we see a certain object, there is a dimension of thought or way of thinking about the object which guides our individual sense of value (*kansei*). This system of thought is presumed to be attributed to a person's cognitive process, which is strongly influenced by sociocultural factors. While previous evidence suggests that culture has no influences upon sensation, cultural factors may provide some meaning and may be intimately connected with perceptual and cognitive processes (Triandis, 1969, 1976).

In recent times, researchers have been exploring cross-cultural approaches towards a comprehensive understanding of the underlying mechanisms of human cognitive processes towards artifacts and the environment. More so for the design industry, cross-cultural understanding is becoming increasingly important as a key factor towards creating value-based innovative products in a highly competitive global market. Among recent scientific cross-cultural psycho-cognitive research, evidence produced has shown that human perceptual and recognition processes are influenced by cultural factors (e.g. Nisbett et al. 2001, Nisbett 2003, Nisbett & Miyamoto 2005). Findings from most studies have kept pointed to evidence that Westerners tend to engage in analytic perceptual processes, and Asians tend to engage in holistic perceptual processes, in making sense of an object and the context in which the object is located. In exploring the factors that create cognitive difference between cultures, *kansei* research (Park, Igarashi & Yamanaka, 2011) applies recognition processes as a logic-based method for understanding consumers' *kansei* by adopting the cognitive test tool used by Sigel and Chiu's experimental method based on categorization tasks. Nevertheless, in the wake of a growing trend of cross-culture *kansei* research, studies are still largely limited to Asia, Europe, and America.

The application of *kansei* study methodologies in developing user-centered products has proven to be successful in Japan; yet, the question remains whether *kansei* study also has potentials to inspire design process across other cultural domains. Although, design researchers have more recently begun to adopt a cross-cultural approach as *kansei*

researchers seek to expand to other international communities, the scope of *kansei* research is still limited and mostly constrained to Asia, Europe and America. Hence, amidst a growing need to understand the user's perception of product design qualities in a global context, much ground is yet to be covered in the application of *kansei* in the context of cultural diversity. Therefore, the limits of *kansei* can provide a research opportunity. This thesis attempts to compare African and East Asian cultures. It aims to push the frontier of *kansei* to improve the understanding of the user's mind process towards the image of products based on different cultural origins and visual appearance. In particular, the thesis investigates the cross-cultural differences of aesthetic sensibility in the evaluation of cross-cultural product designs.

First, exploratory research employs a case survey and a cognitive style test. In the advanced stage, the study adopted a product evaluation test to examine the cross-cultural effects of users' aesthetic value cognition and preference. The scope of the thesis covers East Asia and Africa, with particular emphasis on Japan and Nigeria.

For the first part of the thesis, a case survey was conducted in order to reveal the underlying concept of an emotive element – aesthetics – in African design that could be related to *kansei* value in the Japanese approach to product design. Twenty-four African design professionals participated through a web-based survey using a multi-structured questionnaire. According to the research findings, aesthetics in the context of African design appeared to be relevant to Japanese *kansei*, and there was also an indication of a growing awareness of *kansei* concept. Following the results of this survey, the thesis explores, at a deeper cognitive level, the difference in the perception of objects based on the thought process. To this end, a web-based cognitive style test was conducted following the Chiu's cognitivist approach adopted by Ji et al. (2004). The stimuli were triads of natural and artificial objects (presented in lexical form) presented to participants for a free categorization task. Valid responses were gathered from Japanese participants ( $N = 35$ , 41% Female) and African participants ( $N = 35$ , 43% Female), and were mostly comprised of university students. According to the thesis findings, Japanese participants tend to show more inclinations towards a holistic way of thought. Nevertheless, there was not enough evidence to fully establish this finding due to one case of inconsistency in the expected result.

The main test was designed to examine the cross-cultural differences of aesthetic value perception and preference towards cross-cultural product designs. The key evaluation parameters include aesthetics, familiarity, and preference. In the first part of the test, visual evaluations for fifteen pre-selected product samples with African creative origins (pre-categorized into five traditional, five semi-modern and five modern products) were conducted based on a Semantic Differential (SD) method. The participants included twenty African and twenty East Asian participants. As shown by the thesis findings, the categorizations made by participants were consistent with the three major clusters created in the initial product categorization. A little over half of the object samples that were classified in the same group also remained in its initial pre-category. Following the average distribution graph and analysis of variance, there was no significant difference between cultural groups based on the evaluation of trendiness (how traditional or modern a product sample looks) and its familiarity. Following the principal component analysis result (PCA), the African evaluation structure tends to be simple, while the East Asian's appeared more complex. Also, it was observed that in the case of African participants, the aesthetic variables – *'cute-not cute'* and *'beautiful-not beautiful'* – were combined with 'value', whereas this was not same in the case of East Asian participants. Despite this finding, it was unclear whether the result distinctively reflects the difference of cultures, or a similarity of the cultures. Hence, in the main product evaluation study, the cultural scope was delimited to Japan and Nigeria under the rationale that these countries represent two distinct entities from diverse nationalities in Africa and East Asia. Also, seventeen Japanese inspired product samples were added to the stimuli set, while the previous African product samples plus one more were also included. Since high collinearity was observed between the bipolar variables – *'beautiful-not beautiful'* and *'valuable-not valuable'* – in the pilot evaluation test result, three levels of preference were introduced as new evaluation variables, and were defined as – *'like to see-don't like to see'*, *'like to use-don't like to use'*, and *'like to have-don't like to have'*. Following the results of the evaluation according to one-way ANOVA, there were significant differences in perceptual meaning of product attributes described with evaluation words except for ratings on 'value' and 'simplicity'. Overall, the Nigerian participants tended to show a more positive rating regarding their appraisal for products' aesthetics and preference attitudes compared to Japanese. From the PCA

results, the evaluation structure for the Japanese participants was more complex than the Africans. This result was reflected in the evaluation factors for both Japanese and African samples. The result according to regression analysis reveals cultural tendencies based on a significant relationship between aesthetic evaluation variables and three preference levels (*'like to look at-'*, *'like to use-'* and *'like to have-'*). Significantly, from the Japanese response, the emotional aspect (including 'cuteness' and 'coolness') was pertinent to evaluate the product samples. However, in the case of the Nigerians, this emotional aspect included a strong association of 'value' for almost all the three levels of preference.

Through the procedures described, the following core findings were established concerning the perceived aesthetic values and preferential attitude evoked in the visio-semantic evaluation of the selected product samples:

1. The identification of aesthetic tradition in African design, mostly relating to attractiveness (beauty) and craftsmanship of products, appears to be relevant to the study of *kansei* in a cross-cultural context.

2. Overall, it appears that diverse cognitive style tendencies might exist among the African and East Asian cultures. Following the finding from the preliminary cognitive style test, the Japanese participants tend to show more tendencies for a holistic way of thinking than the African participants. Nevertheless, there was not enough evidence to establish the test assumption.

3. Overall, there were indications of both cultural proximity (points of convergence) and distance (points of divergence) between African and East Asian cultures. The perception of familiarity increases in the case of endogenous cultural evaluation and decreases with exogenous cultural products. The effect of familiarity on product aesthetic evaluation and preference can be moderated by product perception based on cultural origin or ethnocentric factors. From the factorization of evaluation variables, the Japanese showed more complex perceptual structure than the Nigerians. The evaluation factors based on cute and cool were pertinent to the judgment of the aesthetic of products for both Japanese and Nigerian participants. However, the Nigerians tended to show a higher rating for 'value', along with their evaluation for 'coolness' and 'cuteness'. The evaluation variables *'like to look at-'*, *'like to use-'* and *'like to have-'*, can differentiate

levels of preference for designed objects, though more findings will be necessary. The concept of *aesthetics* in African design was revealed as an emotive element and a familiar construct that directly relates to *kansei* in Japanese design.

From the test results, it was supposed that the difference in cognitive styles and visual evaluation for objects exists by reason of sociocultural and ecological influences. In other words, the tests results suggest that cultural factors can implicatively affect value cognition and construction of meaning in product aesthetic perception and attitudes of preference. Finally, it can be deduced from this thesis that there appears to be cultural tendencies moderating the aesthetic perception and attitudes of product designs. In particular, the case of comparison between African and East Asian cultures reveals that both dissimilar and similar perceptual and cognitive processes can exist among regional cultural groups. The thesis thus indicates that culture might influence the appraisal of aesthetic qualities and preferential attitude towards product designs across cultures or subcultures (differing cultures among single national origins or ethnicities). These findings can contribute towards:

1. Expanding the frontier of *kansei* research to include unexplored area such as Africa.
2. Helping product designers and product makers understand the people they design for. In turn, designers can increase the chances for product success and users' satisfaction.
3. Providing insight to understand the aesthetic feeling of 'cuteness' and 'coolness' in Japanese and Nigerian contexts. This information could serve to develop original product designs that reflect the cultural *kansei* of target users.

In spite of current results obtained through this thesis, it remains unclear whether the research findings will reflect similar tendencies with specific cultural groups within the same national boundary or regional cultures such as Africa and East Asia.



## ABSTRACT (In Japanese)

### 概要

認知心理学の理論に基づいて、人工物に対する人間の知覚範囲と感受性の敏感度は、文化的習慣の影響を受けるといわれている。すなわち、我々がある対象物を見る時、その対象物に対する感性を導く思考プロセスには特徴がある。この思考プロセスは、それぞれの社会文化に強く影響を受ける個々人の認知過程に帰属するものと仮定される。先行研究では、文化が人間の感覚に対して影響を与えるのではなく、文化的要因が含んでいる意味が対象物に対する知覚と認知過程に密接に関連している可能性について言及している (Triandis, 1969, 1976)。

近年、人工物と環境に対する人間の思考のメカニズムを総合的に理解する為に、研究者達は比較文化学的研究を行っている。世界的に激しい競争が繰り広げられているデザイン商品市場において、人の感覚的な価値判断を鍵とした革新的な製品を作る為に、異文化間の相互理解が重要視される傾向が高まっている。現在の認知心理学を通じる比較文化研究の中に、人間の理解と認知力は文化的要素に影響されている (e.g. Nisbett et al 2001, Nisbett 2003, Nisbett & Miyamoto 2005)。関連研究が積み重ねた調査結果によると、物事を分類する時、欧米人は分析的な考え方をする傾向があることに対して、アジア人は全体論的な考え方をする傾向がある。感性研究を通して文化的な多様性による認知の違いを検討する為に、Park、五十嵐と山中 (2011) は認識プロセスを論理的な方法として応用し、Sigel と Chiu の分類タスク実験の中に使用された認知テストツールに基づいて消費者の感性を理解する研究を行った。しかし、比較文化の感性研究の増勢に対して、研究範囲はまだアジア、ヨーロッパとアメリカに限られている。

日本では、ユーザーを中心にしたデザイン製品開発において、感性方法論が応用された成功事例がある。しかし、同様のアプローチが他文化においても効果的であるのかどうかは明らかになってない。近年のデザイン研究は感性研究をもとに比較文化学的研究を行っているが、実施国はまだアジアおよび欧米に限

られている。従って、製品デザインの品質に対する感性を探究する為に調査対象国の範囲を広げる必要がある。それによって感性研究の限界はこれからの研究課題となる価値があると考えられる。本研究は特にアフリカと東アジアの文化を比較し、異なる文化から生まれた製品画像を見せることで、ユーザーの思考プロセスを明らかにすることを目指す。異なる文化から生まれた製品を評価する時の、美的感覚のはたらきや相違を明らかにすることが本研究の目的である。

はじめに、認知方法の調査を調べるテストを含めた予備実験が行われた。次段階では文化の相違が美的価値の認識と嗜好性にもたらす影響を調べるため、プロダクトデザインの印象評価実験を行った。調査範囲は東アジアおよびアフリカであり、本研究では特に日本とナイジェリアを焦点とした。

予備実験として、日本の現代プロダクトデザインの感性価値と、アフリカのプロダクトデザインに対する美しさや心地よさに対する判断要因との関わりを明らかにするため、質問紙による評価実験を行った。オンラインアンケートで行われた実験には、アフリカ人デザイナー24名が参加した。実験結果を解析すると、アフリカンデザインにおける美的判断の概念と、日本のデザインに対する感性との関わりが示唆された。そこで、思考プロセスに基づく対象物の知覚過程の相違について、より深い認知レベルで明らかにすることにした。

本実験は、Ji ら（2004）が用いた認知スタイルテストと同様の手法で行った。テストの内容は自然物と人工物を表す単語を自由に分類するものであった。実験の参加者は日本人（ $N = 35$ , 41% 女性）とアフリカ人（ $N = 35$ , 43% 女性）の大学生であった。結果から、日本人被験者は対象物に対して、総体的な印象のとらえ方をする傾向が見られた。

異文化間でのプロダクトデザインに対する美的価値と嗜好性の相違を明らかにすることを本研究の主題とした。

主な評価項目の指標は、美的判断、親しみ感、嗜好性である。第一段階実験は、事前に用意した15個のアフリカンプロダクトの画像（伝統的なデザイン5例、近現代的デザイン5例、現代的デザイン5例）を被験者に提示し、SD法による印象評価実験を行った。被験者は東アジア人とアフリカ人の大学生各20人、計

40人であった。被験者の評価傾向から、刺激としたプロダクトサンプルは、全体の半分のサンプルが選択された際の3つのグループ（伝統、近現代、現代）と同様に分類できることがわかった。それぞれの文化グループに基づいて分散分析を行った結果、プロダクトサンプルに対する親しみ感と時代性の認識における異文化間の有意な差は認められなかった。

主成分分析の結果、東アジア被験者の評価要因は複雑であるのに対して、アフリカ人被験者の評価要因はシンプルであった。また、アフリカ人の場合、「可愛い」と「美しい」という二つの美的な判断要素がプロダクトの「価値」評価と関わる傾向があった。東アジア人被験者においてはこうした傾向は認められなかった。

しかし、これらの結果が異文化間評価における共通点および相違点を示しているかは明らかでない。そこで、続く本実験では特定の文化を持つ日本とナイジェリアの2国を対象とし、実験刺激として日本のプロダクトサンプル画像17つとアフリカンプロダクト画像1つが追加された。

予備実験の結果、二つの変数（「美しい」、「価値のある」）に強い相関があったことから、三つの変数（「見たい」、「使いたい」、「欲しい」）を追加した。分散分析の結果、「価値のある」と「シンプルな」の2項目を除いて、プロダクトの印象を示す評価項目について有意な差が認められた。

全体的な結果として、ナイジェリア人は日本人より評価対象のプロダクトについて美的判断と嗜好性の項目において高く評価する傾向が認められた。主成分分析の結果、日本人の評価要因はナイジェリア人より複雑であることが示され、日本製のプロダクトとアフリカ製のプロダクト双方で同様の傾向が見られた。また回帰分析の結果から、美的価値の評価要因と嗜好性の評価要因（「見たい」、「使いたい」、「欲しい」）において有意な差が認められ、各国ごとに異なる傾向が認められた。日本人は、プロダクトの印象評価において感情的な評価項目（「かわいい」、「格好いい」を含む）が関係する傾向が顕著であった。一方、ナイジェリア人については、こうした感情的な評価項目を含む三つの嗜好性要因すべてが相関しながら、プロダクトの価値が評価されている傾向が示唆された。

以上の実験調査を通して、美的価値と嗜好性の要因を主な評価基準として、プロダクトサンプルについて印象評価実験を行った。その結果、以下のことが明らかとなった。

1。異文化間の印象評価実験において、アフリカンデザインに関する美的様式の評価は、主にプロダクトの美しさと職人的技巧が必要な評価要因であると考えられる。

2。アフリカと東アジアの間では認知スタイルが異なる場合がある。予備実験で行われた認知様式テストの結果から、日本人はアフリカ人より総体的な印象で対象物を評価する傾向がある。

3。アフリカ文化と東アジア文化間において、プロダクトに対する印象評価傾向の共通点と相違点が示唆された。プロダクト評価における内在的な親しみの増加に対して、文化的要因が外在プロダクト評価では親しみ感が低くなった。親しみ感がプロダクト評価に与える影響は出身と民族中心主義的な要因からの認識に影響される。因子分析の結果、日本人の評価要因はナイジェリア人より複雑であった。日本人参加者とナイジェリア人参加者双方にとって、評価因子「かっこいい」と「5かわいい」はプロダクトの美学感に対する判断には強く関連することが認められた。しかし、ナイジェリア人参加者においてはプロダクトの「価値」についての評価が大きく影響していたと考えられる。また嗜好性の評価要因は「見たい」、「使いたい」、「欲しい」の三項目に分類される。アフリカンデザインの美的価値の概念は感情的な評価要因と親しみ感によって構成されることが明らかになり、日本のプロダクトデザインにおける感性価値の概念と非常に近いと考えられる。

以上の結果から、対象物に対する認知プロセスと印象評価の相違は、社会文化的背景および生態学的要因に影響されていると考えられる。すなわち、文化的要因はプロダクトに対する価値観、美的判断と嗜好性に影響を与える傾向がある。手づくりの製品と機械生産による製品に対する印象評価実験の結果から、文化的要素は美的価値の評価と嗜好性に影響を与える。アフリカ文化と東アジア文化の比較から、認知スタイルの相似点と相違点が見られる。

本研究は、文化はプロダクトデザインに対する美学的な品質への評価と嗜好に影響を与えることを明らかにした。

文中語句の本研究における意義を以下に示す：

感性研究の研究範囲を広げる（アフリカを含め）

クトデザイナーと製造者がよりユーザーと消費者を理解できる為にサポートする。プロダクトの販促促進とユーザー満足度の向上に繋がると考えられる。

美学感感覚「かわいい」と「キュート」が日本またナイジェリア文化の中での意味について理解する為の洞察を提供する。これはターゲットユーザーの文化的な感性に応じてデザインを提案する為の知識である。

本研究で認められた、これらの相違点および傾向について、アフリカと東アジアの他地域においても同様であるかどうかは明らかにされていない。

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## **OPERATIONAL DEFINITIONS** (*in an alphabetical order*)

*Aesthetics*: a cognitive state of awareness and thought about the sensory and emotive qualities of a designed object (Koren, 2010).

*Aesthetic Value*: an assigned quality (intrinsic or extrinsic, positive or negative) to a particular object, that can render it desirable or preferred.

*Aesthetic Experience*: aesthetic experience with product design qualities is viewed as a user's *kansei* value that has both intrinsic and extrinsic dimensions. As proposed in this study, this experience is defined in a tripartite layer namely: surficial, functional and symbolic.

*Aesthetic Perception*: an initial function of mental processes that is relevant to a decision-making process. It is subjective and connects to individual's sensibility or intuitive awareness of the emotive quality of a product, often influenced by cultural values.

*Artifact*: any creation of human skill and ingenious activity. A designed object or product is taken as an example of an artifact originally conceived and created by a craftsman, designer or maker.

*Affective Value*: the utility gained from the emotions or feelings that are evoked by a product.

*Culture*: a shared knowledge of ideas, ideals and values that define a particular group of people or human society. It can be manifested at both a material level (tangible) and a non-material level (intangible).

*Cross-Cultural*: involving a comparison between two or more distinct cultural groups.

*Culture-Inspired Product Design*: design that is conceived or developed based on a culture's artistic tradition, ingenuity, and philosophy.

*Design*: an ideation and creation of all forms of artifacts partly or wholly developed based on a person's ingenuity for a particular people's needs and aesthetic appreciations.

*Endogenous Evaluation Condition*: an evaluation condition for a product of an indigenous origin.

*Exogenous Evaluation Condition*: an evaluation condition for a product of a foreign origin.

*Kansei* (感性): a Japanese terminology that unifies concepts such as sensitivity, sense, sensibility, feeling, aesthetics, emotion, affection and intuition (Harada, 1999). It is a holistic and contextual sensory-mental model for human being”, where “senses, perception, mental processes, and behaviors are all considered in the model to encounter (understand) human beings in the perceptive field (Lévy & Yamanaka, 2009). Expanded scholarly definitions on *kansei* are given at the thesis appendix.

*Modern Product*: a kind of product characterized by the essence of modern design as such that can be visually recognized in appearance, form, material composition, and technical function.

*Product Design*: in the study, product design is delimited to the product’s visual design (appearance).

*Product Quality*: the aggregate of properties (tangible and intangible) and distinguishing characteristics of a product that maximize its suitability to fulfil an intended function and to fit user satisfaction.

*Semantic Differential (SD) Method*: a psychometric scale developed by Charles E. Osgood to measure the connotative meaning of a target stimulus. This tool is applied to evaluate the affective impacts of a target stimulus through its visually perceived qualities.

*Traditional Product*: a kind of product characterized by the essence of old lifestyles and bears tangible cultural symbols associated with a particular history, meaning or belief. Also, it can be recognized in terms of a material formation or level of technology.

*Visio-Semantic Evaluation*: an evaluation based on visual processing of stimuli using verbal descriptors on a bipolar scale to signify their perceptual magnitudes.

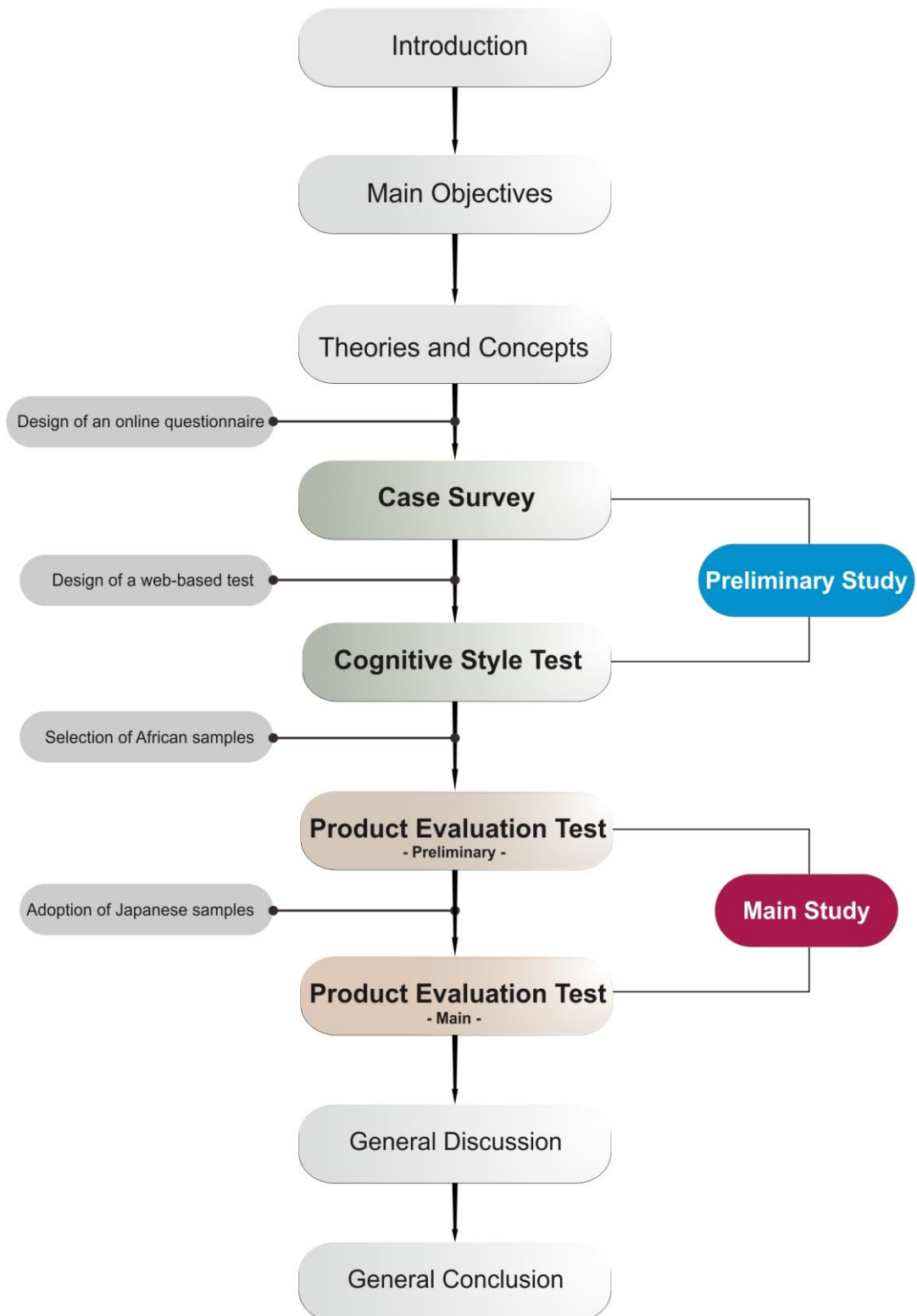


Figure 1. Structure of the thesis



## 1. BACKGROUND OF THE STUDY

### 1.1. Rationale for the Study

#### 1.1.1. Global Challenges and Design Opportunities



Figure 2. Itchō, H. (Artist). (1888). *Blind monks examining an elephant*.

(An online image retrieved November 1, 2014 from

[http://en.wikipedia.org/wiki/File:Blind\\_monks\\_examining\\_an\\_elephant.jpg](http://en.wikipedia.org/wiki/File:Blind_monks_examining_an_elephant.jpg).

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Marshall Singer in Samovar & Porter (1976) began his article on two notable premises: first, *individual patterns of behavior are based on individual perceptions<sup>1</sup> of the external world*, and second *because these patterns are learned they are culturally based*. These

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<sup>1</sup> Marshall Singer defines perception here as “the process by which an individual select, evaluate, and organize stimuli from the external environment”. This definition includes “cognition” in the interpretative sense (Singer, 1966, 1976). Cognitive factors which involve cognitive functions such as attention, and reasoning, are internal to each person and serve to modulate behavior and behavioral responses to external stimuli (Danili & Reid, 2006; Roy, 2013).

assumptions provide a clue to suppose that psychological and social factors invariably inform individual forms of (inter)action in the world. Hence, two pertinent questions arise: How consequential is understanding the human perceptual process and how can this knowledge be relevant to the world of design today?

The poetic piece ‘The blind men and the elephant’ is one of the most famous versions of the legendary story, composed by the prolific and admired poet of the nineteenth century, John Godfrey Saxe [1816-1887] (Gardner, 1995). This story, as illustrated in Figure 2, is to a great extent a metaphorical reflection of the current state of human society. Whether it matters that designers are sensitive to social, cultural and psychological needs of the people they design for, is not a question that can be left unanswered. In the context of design today, this question holds an important consideration for the elicitation of users value within cultural diversities. It may be true that some major arguments have emanated from different worldviews leading to more diversity of cultures. However, the understanding of cultural differences can open up opportunities to address human existential gaps. In this regard, designers are expected to use design as a tool that can promote cross-cultural understanding and thereby be a potential driver to address socio-psychological and economic problems in the world. However, as much as design could be a problem-solving tool used by designers, the challenging issue is how effective can design be in addressing the problems of a rapidly growing and complex society? More so, how can humans resolve on the opposing views of materialism versus spirituality, excessiveness versus essentiality, intricacy versus simplicity, centrism versus extremism, rationalism versus subjectivism, individualism versus collectivism, tangibility versus intangibility, for the overall welfare of ecology and humanity?

Of the world’s seven billion inhabitants, less than ninety percent have little or no access to quality products that are exclusively developed for the richest ten percent of consumers (Polak, 2009). With an increasing effect of globalization and technology on design in the last few decades, the question remains whether the gap of living standards between the developing world and the advanced countries can be bridged. Despite the

emergence of a global marketplace, cultural issues<sup>2</sup> cannot be overlooked, and if recognized, can become a possible driver for innovative and successful adoption of more inclusive designs (S.H.Lee, Harada, & Stappers 2000, 2002; Moalosi, Popovic, & Hickling-Hudson, 2006). Hence, the consideration for multi-cultural users could prompt a renewed direction in design thinking and its process. After all, perceptual dissonance, cognitive style and subjective reality are real within a global cultural landscape, as reflected by numerous researchers in the field of cognitive and cultural psychology. As there are emphases on revitalising local design potentials for a global market, a refined approach to design that aims to promote sociocultural interaction while retaining user values is expected. While culture can serve as a tool to inspire innovation and meaningful experience in product design, a deeper understanding of user's mind process beyond cultural boundaries will provide new insights to developing more durable and sustainable products.

The concept of *kansei* (感性), simply denoting human sensibility, is anchored in Japanese design philosophy, and its foremost application was in the engineering field. In this study, the user's affective value evoked by product designs is considered a function of the human *kansei* that should be understood by the designers to enrich design process. This thesis brings to fore an investigation aimed to understand users' perception of aesthetic value in cultural designed objects based on research methods in *kansei* science. The aim is for this knowledge to afford design researchers and practitioners a platform for discussion on the significance of cultural factors and user value in design. In addition, designers can translate this knowledge into improving user-centered product designs which can deliver rich, meaningful and more intuitive products. While several *kansei* studies have considered aesthetics in attempts to understand the users' response to product's values, no research has yet delved into the *kansei* study with Africa designs. With a focus on African and East Asian cultures, this study has adopted reliable tools from *kansei* research – specifically Categorization tasks and Semantic Differential (SD)

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<sup>2</sup> Cross-cultural sensitivity encompasses the knowledge, awareness and acceptance of other cultures. The former Secretary General of the UN, Kofi Annan advocates cultural sensitivity as an essential value in the modern world: 'Tolerance, inter-cultural dialogue and respect for diversity are more essential than ever in a world where people are becoming more and more closely interconnected'. ([www.un.org/news/press/docs/2004/sgsm9195.doc.htm](http://www.un.org/news/press/docs/2004/sgsm9195.doc.htm)). It has been shown that cross-cultural sensitivity can impact the operating income of corporations seeking to expand their activities to foreign markets e.g. an American manufacturer of golf balls, packaging balls in packs of four, failed to operate successfully in Japan, a country where the number four holds the meaning of death. ([www.kwintessential.co.uk/culturalservices/articles/culturalsensitivity.html](http://www.kwintessential.co.uk/culturalservices/articles/culturalsensitivity.html))

method. Through these evaluation tools, the thesis examines the cross-cultural difference of aesthetic value cognition using visual stimuli which include a) series of stimuli adopted from a previous study on cognitive style test and b) selected samples of handcrafted and machine-made objects with African and Japanese creative origins. The thesis strongly anticipates that further steps towards understanding affective value of culturally diverse users in product designs will be a necessary factor in achieving seamless integration of users' psycho-cognitive and sociocultural needs into product designs.

## **1.2. Design for the User's Aesthetic Value**

### **1.2.1. Aesthetics within the *Kansei* Framework**

At the time my essay titled *Kansei as a function of Aesthetic Experience in Product Design*<sup>3</sup> got published as a book chapter among the collection of the best papers from the International Symposium of Affective Engineering (ISAE 2013) held at Kitakyushu, Japan, I encountered a newly published journal article written by Nakamura Tomoe entitled *The Scope of Aisthetics for Comparative Aesthetics: An Examination of Kanseigaku in Japan*. Surprisingly, the thread of that purpose which seems to run through Nakamura's paper is also intertwined with the core idea of mine, which emphasizes the need to deconstruct the concept of *kansei* with a more universally familiar concept, drawing inspiration from the inexhaustible expositions on the science and phenomenology of aesthetics.

Remarkably, the study of the science of beauty – *aesthetics* – began with the ontological work of the German philosopher Alexander Gottlieb Baumgarten (1714–1762), which he developed in his treatise *Aesthetica* (1750). Within his theoretical framework, he defined aesthetics<sup>4</sup> as the “science of sensuous cognition” with recourse to the class of Greek words such as *aesthesis*, *aisthanesthai*, *aisthetos* and *aisthetikos* (Welsch, 1997). Following the recent exposition of Nakamura (2013), the concept of *aisthetics* (perception) proposed by Wolfgang Iser was advanced to extend the

---

<sup>3</sup> Adelabu O. S. & Yamanaka T. (2014). *Kansei* as a Function of Aesthetic Experience in Product Design. In Watada Junzo et.al (Eds.), *Industrial Applications of Affective Engineering*, Springer International Publishing Switzerland, 83-95.

<sup>4</sup> Based on different perspectives, the term aesthetics has been employed by other notable philosophers among whom are the Greek philosopher Aristotle (384 –322 BC), Indian philosopher Abhinavagupta (c. 950 – 1020 AD), Scottish philosopher David Hume (1711-1776) and the German philosopher, Immanuel Kant (1724–1804).

understanding of aesthetics as a study of sensory perception. First, Nakamura situates the increasing acceptance of *aisthetics* in Japan in connection with a historical evolution of the term “kansei” (taken as *aisthesis*). She further underlines the difficulty of translation between European and Japanese concepts of the term *aesthetic*. Particularly, the approach to *aisthetics* derived from Eisuke Tsugami’s recently proposed theory of *kanseigaku* by was cited to highlight the affinity and disparity between Japanese *kanseigaku* and Baumgarten’s construct. By characterizing Baumgartens’ *aesthetics* in the dichotomous context of the traditional meaning – between *aisthesis* and *noesis* – in Europe, and that of the rationalistic conceptualization of perception, provides a basis for comparing the European and non-European cultural treatments as an initiative for comparative *aisthetics*. Particularly, three perspectives of *aesthetics* in Japanese society were identified as *bigaku* 美学 (Aesthetics), *kanseigaku* 感性学<sup>5</sup> (Aisthetics) and *geijutsugaku* 芸術学 (Artistics). As is argued in this thesis, Nakamura submits that the scope of *aisthetics* transcends the philosophy of art or beauty, and can be nurtured to ‘develop a new cultural paradigm’.

As indicated by Marra (1999, 2010), Nishi Amane (1829-1897) introduced the field of aesthetics to Japan through his work: *Bimyogaku Setsu*<sup>6</sup> (1877). However, despite the richness of the genealogical body of discourse on knowledge and perception, it may be argued that there remain more questions than answers provided. In fact, as time passes by, there is still an unresolved question of the ‘secret affair’ between the ‘mind-reason’ and ‘passion-feelings’, in the understanding of ourselves and how we see our world. Even within the scientific field of *kansei*, several researchers have always reiterated the essence of the interplay of emotion and cognition in the construction of the meaning of objects, yet it is unclear how true this is when juxtaposed with Descartes’ philosophical

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<sup>5</sup> As noted by Nakamura (2013), the adjective ‘*kanseiteki*’ as translated ‘sensitive’ in a recent Japanese scientific research project, implies that the noun ‘*kansei*’ should be translated into English as ‘sensitivity’. However, she used ‘sensibility’ in order to clarify between the terms ‘*kansei*’ and ‘*kanjusei*’, which is the common translation of the English word ‘sensitivity’. The reason is that the word ‘*kanjusei* 感受性’ includes ‘*ju* 受’: derivative of the verb ‘*ukeru* 受ける’ (to receive), and thus reflects a passive and receptive quality of sensitivity. Nevertheless, the concept of ‘sensitive cognition’ envisaged by the researchers expresses an active and dynamic quality of sensory perception. In order to include those qualities, ‘*kansei*’ (and therefore its common English translation ‘sensibility’) is deemed more appropriate than ‘sensitivity’. Although, she posited that the translation ‘*sensibility*’ is also subject to doubt, and hence, the new translation ‘*aisthesis*’ was adopted.

<sup>6</sup> The book title is translated as *The Theory of Aesthetics*

standpoint expressed in his basic Cartesian a priori that “I think, therefore I am” (*cogito, ergo sum*). Marra (2010) puts it thus:

“Descartes did not deny the importance that passions and feelings have in the life of human beings, as his 1649 treatise on *The Passions of the Soul* attests. The motto does indicate, however, that one cannot rely on the passions in order to understand them. Instead, one must analyze them with the rationality of the geometer whose tools of inquiry – mind and reason – need to be free and independent from the object of their exploration. For Descartes, to think is definitely not to feel, even if, as Pascal reminded him, ‘the heart has its reasons, which reason cannot know.’”

### **1.2.2. Aesthetic Value in Product Design**

Classically, product design is made up of three main elements: ergonomics (comfort with product), aesthetics (pleasure with product) and function (purpose of product). As illustrated in Figure 3, a balanced product design occurs when these three components are properly configured (Jordan, 1999). In a world now dominated by many product inventions built with advanced technical capability, the need for a product to provide a unique experience is quickly becoming a priority to both consumers, and product makers. (Creusen & Schoormans, 2005; Porter, 2002).



Figure 3. Elements of design

Beyond form follows function, Form follows Emotion has become a new mantra for design since the past few decades. This slogan was coined by Professor Hartmut Esslinger, and adopted as the philosophy of the company he founded – the Frog Design Inc. As he exemplified with ancient Greek objects or the Japanese traditional house, humans will always strive for a deeper meaning. Since functional quality (当たり前品質 - *Atarimae Hinshitsu*) exists to justify the basic need of a product, aesthetics (魅力的品質 - *Miryokuteki Hinshitsu*) have been used as a tool for communicating deep meaning and the creation of product's value and personal experience.

In today's global-centric yet culturally-sensitive market, there is a growing concern towards the in-depth user's need for products that are beyond the pragmatic dimension. There are indications that the human-product relationship in the twenty-first century will be dictated by value and the movement toward eliciting the 'humanness' of products. Accordingly, the design trend is following a gradual shift from *use* to *user*, from *function*

to *feeling*, and from *high-tech* to *high touch*<sup>7</sup>. The *use, function, and high-tech* focus is steadily shifting away from technology itself towards concern about human feeling (cf. Figure 4). This movement in design is exemplified by the ‘KANSEI Value Creation Initiative’ developed by the Japanese government through its Ministry of Economy, Trade and Industry (METI). Between the Fiscal years 2008 and 2010, METI initiated the ‘KANSEI Value Creation’ method as a national strategy towards the promotion its local creative industry. The initiative was adopted to engender a new dimension of value in well-finished local products that can elicit users’ emotional satisfaction beyond a product’s functional quality. Particularly, the *kansei* value<sup>8</sup> has been established as this new axis of “value that is actualized when a product or service appeals to the *kansei* of ordinary citizens and arouses their emotions and empathy”. According to METI, “kansei value becomes perceivable when a user of a product empathizes with, or feels touched by, the consideration and commitment that its manufacturer has given to the product”. Not only does this trend hold a significant promise for an economic growth but also it delivers a consideration to meet the emotional need of a wide range of Japanese product consumers. Significantly, the initiative marked a pronounced shift in market trend from ‘function to feeling’ and ‘materialistic fulfilment to emotional fulfilment’.

The essence of a value-oriented design was captured in the opening remark of the 2013 Good Design Award:

“Though society may grow sophisticated, [...] and remarkable technological advances may unfold, [...] designs that won this year’s award, [...] emphasizes the beauty of relationships, the beauty of balance, and overall harmony, [...] as well as the beauty of beneficial relationships with the things in which that value is found.”

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<sup>7</sup> An ensuing discussion from a brief interview with Professor Rungtai Lin on 24<sup>th</sup> of May, 2012: 9:35AM at the International Conference of the 2012 *Kansei* Engineering and Emotional Research (Professor Lin researches on framework and process development for cultural product design and he is affiliated with the Craft and Design Department, National University of Arts, Penghu, Taiwan)

<sup>8</sup> More information is contained in the official report published by METI.  
(See <http://www.meti.go.jp/english/information/downloadfiles/PressRelease/080620KANSEI.pdf>)



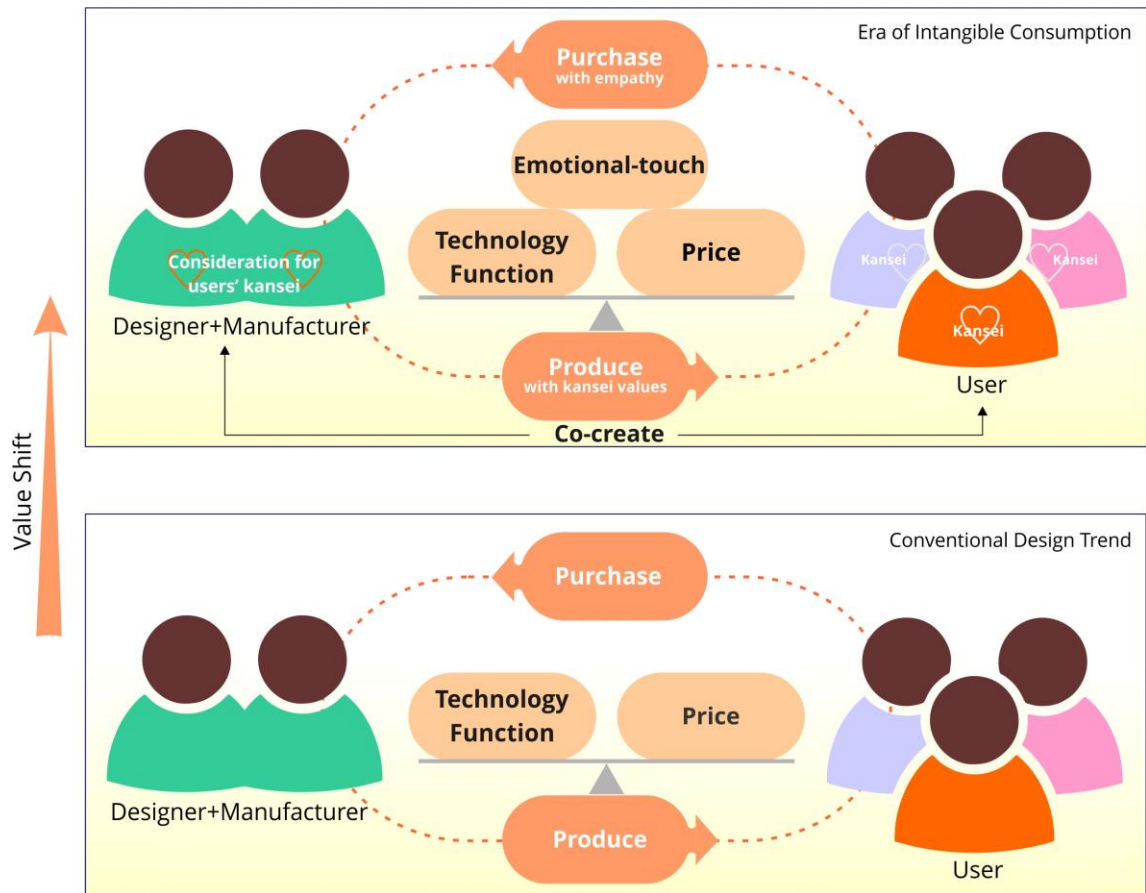


Figure 4. Gradual shift from conventional design trend to *Kansei* approach to design

For this thesis, an operational definition of aesthetics was drawn from Koren (2010). Here, aesthetics or the aesthetic is defined as “a cognitive mode in which you are aware of, and think about, the sensory and emotive qualities of phenomena and things.” This view of aesthetics relates it as a mental construct and a cognitive quality rather than being an inherent property of designed objects. Hence, the use of the word *aesthetics* in the description of an object emphasizes its ability to evoke aesthetics rather than it being a property of the object itself. This resonates with the saying that, “beauty is in the eye of the beholder”. Therefore, this study holds the view that aesthetics is a function of human *kansei* which can be anchored on the cognition of perceptible qualities and emotions evoked through user – product interaction within situated contexts, either by immediate sensory perception or bodily interaction. Hence, we construe aesthetic perception as a *kansei* factor and an emotive cognition in the construction of products' values. It is supposed that this phenomenon traverses all layers of product experience in both intrinsic and extrinsic ways, which were classified into three dimensions – surficial, functional and symbolic (Adelabu & Yamanaka, 2014). Thus, aesthetic cognition is

defined as a complex function of mental processes that are important to the decision making process. It is subjective and connects to individual's sensibility or intuitive awareness of the emotive quality of a product, within a specific context.

Holbrook and colleagues (1999) provide a comprehensible framework that underpin eight key types of consumer value, each of which appears to deserve consideration in the analysis of consumer behavior (illustrated in Table 1). Wagner (1999) suggests that, in the consumption experience, aesthetic value in the fine arts – music, dance, painting, sculpture, and poetry – is presented in its purest essence through the experience of beauty (intrinsic value). However, this view may not be thoroughly applicable to applied arts such as product design, where aesthetic value might serve a more practical or functional purpose (extrinsic value). For instance, in fashion, beauty depends on a consumer's perception of a form that not only is attractive, but that also meets some set of utilitarian and social needs. In particular, the beauty of the product design lies within its pleasing appearance, the ability of the clothes to keep warm (efficiency), its role in conveying the impression of prestige (status), or the role of decorum that involves covering oneself up for ethical reasons (virtue). Hence, it can be deduced that the aesthetic value of product design is both intrinsic and extrinsic, both self- and other-oriented, and both reactive and active in nature.

Consumer value constitutes an essential component in consumer product experience and satisfaction. Towards the description of a typology of consumer value, Holbrook and colleagues (2002) provide a comprehensible framework that underpin eight key types of consumer value, each of which appears to deserve consideration in the analysis of consumer behavior. These core elements are polarized under two main categories as shown in Table 1.

Table 1. A typology of consumer value according to Holbrook (1999)

Value orientation	Extrinsic	Intrinsic
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Self-oriented	Active	Efficiency	Play
	Reactive	Excellence	Aesthetics
Other-oriented	Active	Status	Ethics
	Reactive	Esteem	Spirituality

To support the argument advanced in this dissertation, the aesthetic dimension of consumer value is being focused on while constructing it within a context of product design evaluation. Value is taken here as a socio-psychological construct which constitute an essential component of the user's product experience and satisfaction. Underlying this construct are belief systems of individuals or the shared knowledge of particular group of people. Values, therefore, are rooted in personally acquired knowledge or beliefs that develop based on either the immediate culture of that individual or the culture of a group or class of people that an individual want to associate with. It is assumed that the perceptual and cognitive processing for product design valuation may vary from one individual to another and from one group of people to another, depending on internal factors such as cognitive styles, and external factors like cultural characteristics. Hence, this study considers the difference between cultures because of an individual's tendencies evaluation of products is influenced by the system of values in which he/she is operating. With the growing complexity of human consumption, the influence of product hedonic value and the human thought process are believed to play a big role in guiding what users choose to own. As much as this might be the case, and to understand more holistically the human mind process, it is important to understand other external factors affecting a user's consumption attitude such as culture, and in particular how it mediates the human value construction and *kansei* process.

### 1.2.3. Considering the User's Aesthetic Value over Cultural Diversity

Conventionally design communication<sup>9</sup> has been an exclusive reserve of one culture without giving much consideration for another. In this situation, ethnocentric sentiments tend to prevail in assigning meanings and significance to product aesthetics, symbols and

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<sup>9</sup> When a user first comes in contact with a product, the physical attributes of such product provides a holistic impression and meaning that can affect their cognitive, affective and behavioral responses. The theory of design communication considers a product design as a medium by which designers convey certain messages to the users. The effectiveness of this communication can depend on the extent to which the designers' conception (intended idea) aligns with the users' impression (perceived idea).

values. Bringing this to focus might be required to resolve issues of differentiating products based on their place-of-origin towards empathizing for design qualities without cross-cultural bias. The creation of value sensitive and emotionally durable objects should therefore be considered not only for the local users but also international consumers. With a global variance in cultural practices, economy and technology, design must continue to evolve to satisfy different facets and processes of communicating true values that touch people's affective needs beyond cultural boundaries. While the richness of traditional cultures holds a great potential for meaningful and valuable experiences with products, understanding the perception of value with traditional and modern products might provide a new way to develop better products for future designs. Towards this realization, *kansei* evaluation of cultural design can be seen and used as a method for understanding human subjectivity and behavior better, and for integrating this knowledge into improving the design process for cross-cultural approaches (cf. Figure 5).

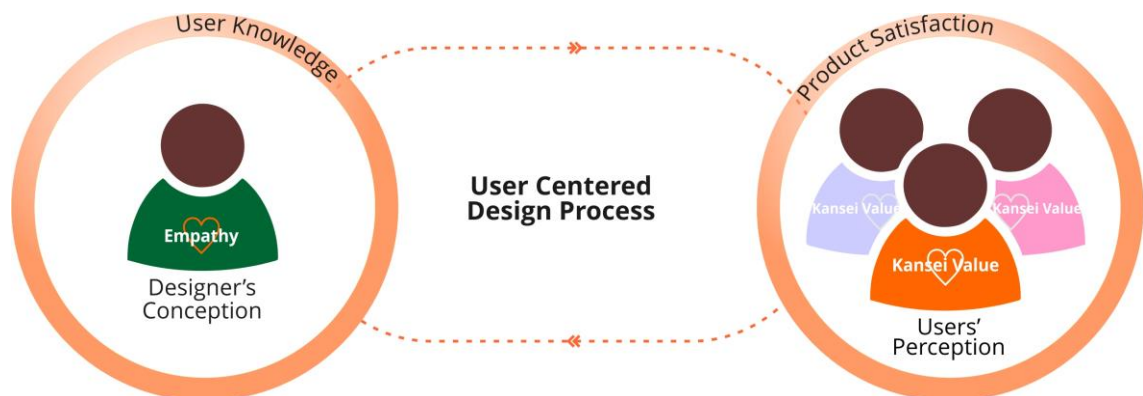


Figure 5. The *kansei* approach to user centered design process

*Kansei* (感性) has strong Japanese origins. The term can refer to human feelings and implicit impressions towards a certain artefact, environment or situation, gathered through sensory inputs, and processed by affective and cognitive functions. Though it is etymologically rooted in Japan, Harada (2003) suggests that the terminology of “kansei” draws on the work of the late German philosopher, Alexander Gottlieb Baumgarten. In the 1970s, *Kansei/Affective Engineering* evolved as an advanced industrial design method and a user-based technology for fulfilling consumers' psychological feelings and emotional demands in product and services (Nagamachi, 1995). Today, the field of

*kansei* research is growing as a consilience of disciplines concerned with the understanding and interpreting of the state of the human mind and behavior as an interactive function of the brain, neural system, artifacts and the environment. (See appendix for scholarly definitions about *kansei*)

As product design capabilities continue to expand beyond cultural borders, there is also a growing need to pay attention to cross-cultural issues. Pragmatically, designers are expected to develop successful products that truly resonate with the value of the end users. This could be within the sphere of the designer's local, regional or global culture. Currently, the infusion of aesthetic qualities in design has a potential to fulfill both effective and affective<sup>10</sup> roles of product usage and experience. Therefore, this study posits a two-dimensional purpose of aesthetic qualities in good products. The first is the effective purpose. The second is the affective purpose. The effective purpose of an aesthetic quality works to enhance the functionality of a product, enabling the user to it in a way that is pleasurable. This can be seen also as the *pragmatic* dimension of aesthetic qualities in product designs. On the other hand, the affective component is triggered when a user perceives product appearance as being attractive and expresses identity that can provoke memories and symbolic meaning. This latter aspect helps to communicate the hedonic aspect of design aesthetics. Hassenzahl (2003) describes pragmatic function as being strongly tied to internally-generated or externally-given behavioral goals, whereas the hedonic function is connected to an individual's self and psychological well-being<sup>11</sup>.

A growing work of research has been concerned with understanding the user's perception of products properties related to aesthetic values (Berlyne, 1971; Bloch, 1995b; Brunel & Kumar, 2007; Hekkert, 1995; Muller, 2001; Veryzer & Hutchinson, 2014; Veryzer, 1993; Whitfield & Slatter, 1979). Based on major findings, the aesthetic responses of consumer to product designs (and their significant effects on purchase, usage and user satisfaction) are considerable issues of interest to consumer researches and product designers alike. Aside from product-related properties, it has been noted that

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<sup>10</sup> Effective means it's capable of producing an intended result or a striking effect. Affective means that it is characterized by emotion i.e. it evokes emotive qualities of a product.

<sup>11</sup> Hassenzahl (2003) gave an insightful description on how products are perceived by the user.

human factors such as culture and personality can influence design tastes and preferences (Bloch, 1995b; Crilly, Moultrie, & Clarkson, 2004; Desmet & Hekkert, 2007). Moreover, culture can be a strong factor in shaping the meanings and associations that users attribute to product designs based on their visual impression (Creusen & Schoormans, 2005; Whitfield & Wiltshire, 1983).

As the importance of the sensorial content of objects continues to grow, the pervasiveness and significance of aesthetics as a factor in human-product experience cannot be underestimated in an attempt to understand the nature of human *kansei*. *Kansei*, which can be described as a holistic and contextual sensory-mental model, shapes the human aesthetic experience as it relates to the physiological and psychological aspects of product design (Adelabu & Yamanaka, 2014). Senses, cognition, affect and behavioral processes (as described in Figure 6) are all considered in the *kansei* model to understand human perception (Lévy & Yamanaka, 2009). Even though the phenomenology of “aesthetics” still appears elusive in the field of art and design theories, its interrelatedness with *kansei* can be established. Aesthetic perception in design artefacts is anchored by an individual *kansei* (i.e. subjective sense of value for a certain artefact, environment or situation through various sensory modalities such as sight, hearing, touch, smell, taste and balance includes the intuitive perception and reaction to external stimuli) (Nagamachi, 2001). Since *kansei* is becoming more relevant to design applications today, design artefacts are considered to evoke feelings which can be characterized to understand human mind processes. Significantly, the aesthetic qualities of products have been used in *kansei* studies, which seek to quantify people’s perceptions of designed objects. The perceptions of aesthetics in these products are evaluated as a subjective response which covers sensory perception, cognitive and affective processes, and behavioral responses.

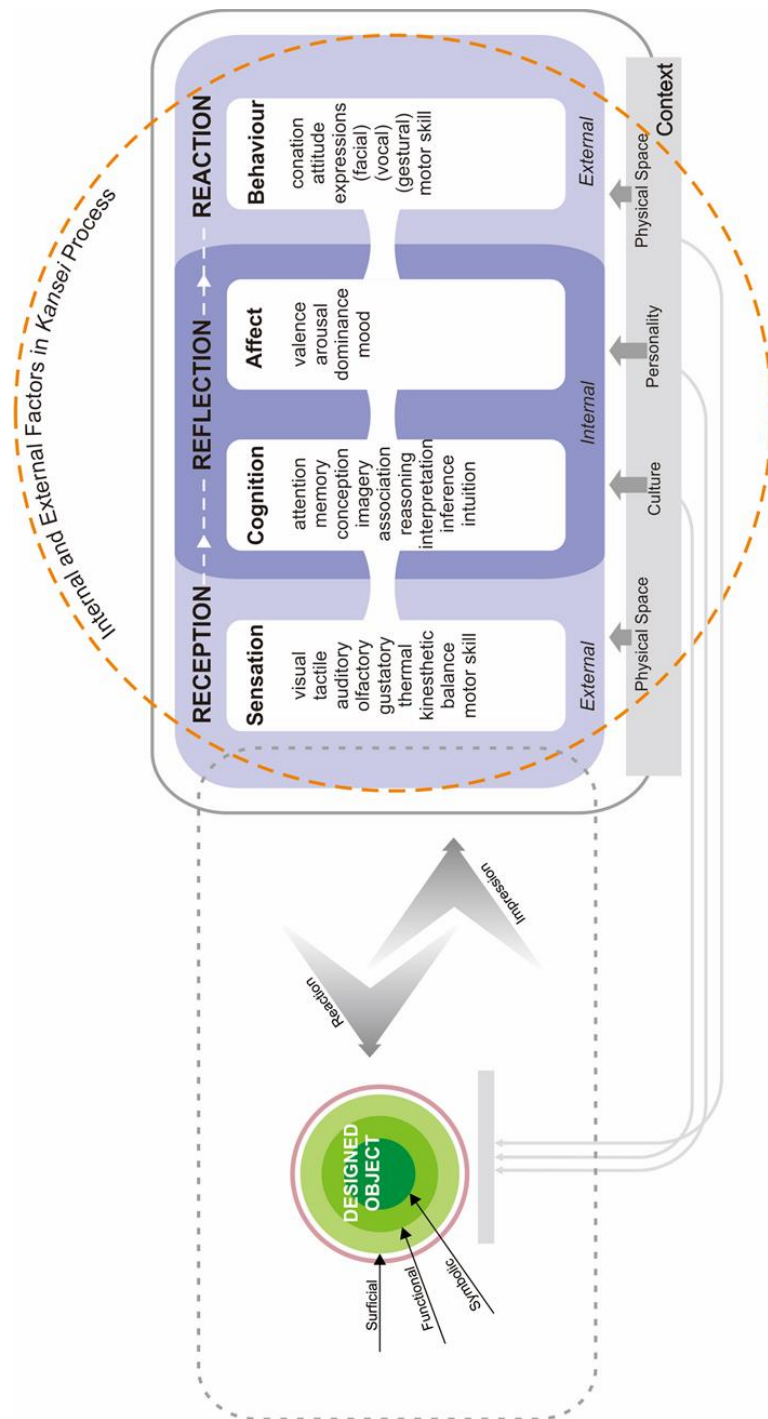


Figure 6. A proposed model of human-product experience in *kansei* process

Based on some existing theories of human mechanisms for information processing (e.g. Crilly et al., 2004; Leder, Belke, Oeberst, & Augustin, 2004; Lévy & Yamanaka, 2009; Norman, 2004), the above model describes the external and internal factors associated with human sensory, cognitive, affective and behavioral aspects of perceiving an object of interest. Users' impression of a designed object is considered not only to be exuded by the products visceral composition, but can also be inextricably connected to their impact on lifestyle and socio-cultural practices. This study extends the argument by Triandis (1969, 1976), that cultural factors may provide some of the meaning involved and is intimately connected with perceptual and cognitive processes.

While the application of *kansei* methodologies in developing user-centered products has proven successful in Japan, it is still uncertain whether it can be well adapted to understand user aesthetic value towards product designs across diverse cultural domains. Although design researchers have begun to adopt a cross-cultural approach in recent times, and while *kansei* seeks to expand to international communities, the scope of *kansei* research is still limited and mostly constrained to Asia, Europe and America. Therefore, this study attempts to investigate and compare African and East Asian cultures as it aims to push the frontier of *kansei* study and to improve the understanding of the user's mind process towards the image of products based on different cultural origins and visual appearance. It is anticipated that the application of *kansei* studies to the African design domain will expand the understanding of the cross-cultural dynamics of *kansei*. This knowledge, in turn, can translate into improving design process for products that are cross-culturally sensitive, instinctively connective, emotionally rewarding and widely acceptable. Figure 7 relates an overview of the research background.

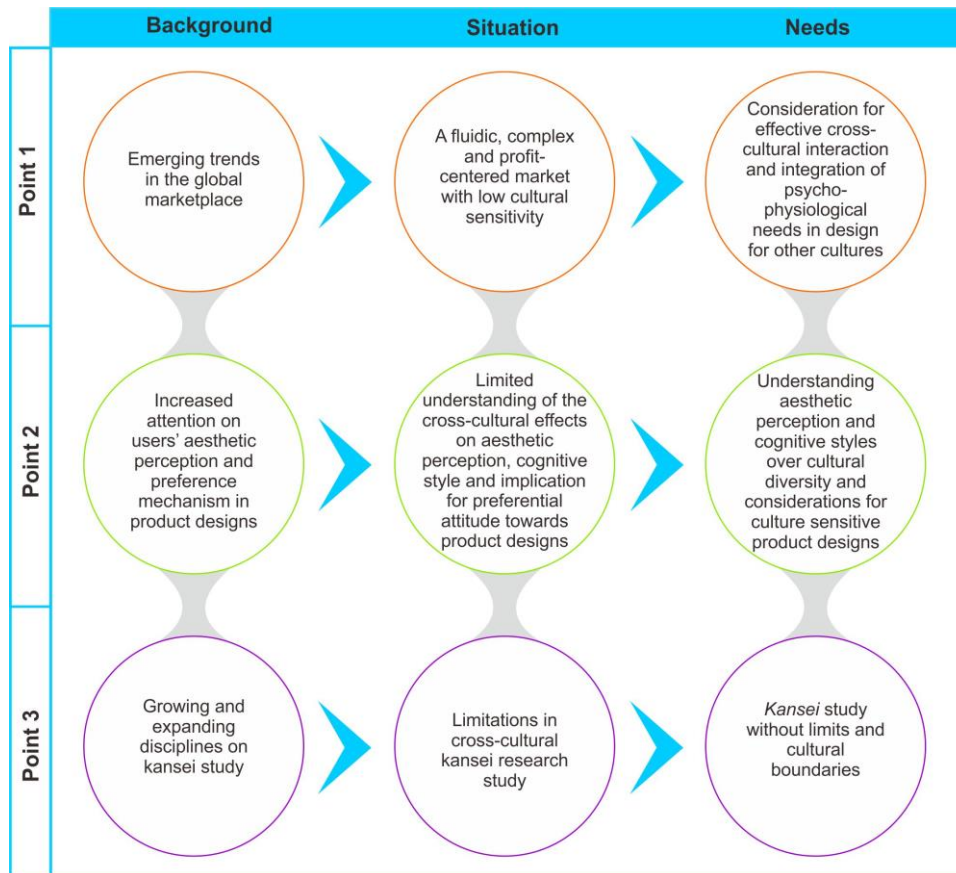


Figure 7. Synthesis of background and needs of research



## 2. OBJECTIVES OF THE STUDY

### 2.1. Main Objective and Goals of Research

Over the past two decades, there has been an increased need for understanding consumer perception of product appearance (Bloch, 1995; Crilly, Moultrie, & Clarkson, 2004; Creusen & Schoormans, 2005; Blijlevens, Creusen, & Schoormans, 2009; Desmet & Hekkert, 2007; Veyisoğlu, 2010; Khalaj & Pedgley, 2014). From the preceding studies, it is widely acknowledged that the first impression given by a product's appearance can have a far-reaching effect in shaping user's attitude towards the product and the messages (meaning) it conveys. According to Crilly, Moultrie, and Clarkson (2004), the initial perception of product design is pertinent in the process of design communication. It affects cognitive, affective and behavioral responses to a product, and this in turn can influence the user's interest towards it. Prior research investigating the relationship between novelty and aesthetic preference has identified three fundamental dimensions of product semantics – trendiness, complexity, and emotion – as predictor variables for novelty, and has shown that trendiness has an outweighing influence (Hung & Chen, 2012). The question of 'how' and 'why' individuals choose an object has become an important theme in understanding the user's motivation in product evaluation. In *kansei* research, preference<sup>12</sup> mechanism is identified as a means to understand the mind process, and to evaluate the level of disposition a user might have towards a stimulus.

The semantic and semiotic communication in product design can be considered from dual perspectives: the designers, who conceive, create and convey aesthetic concepts; and the users, who receive, perceive, and interpret them. Focusing on the aspect of product users, the research attempts to examine perceptual tendencies towards familiar and unfamiliar products' aesthetic attributes, and particularly how aesthetics interplay in broader cultural contexts, to understand this phenomenon in a cross-cultural evaluation process. Hence, the research sought to promote the understanding of the impact of perceptual experience on the aesthetic valuation/ preference of target product culturally diverse users.

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<sup>12</sup> Preference is a psychological attitude. It could be interpreted as an "evaluative judgment in the sense of liking or disliking an object" (Scherer, 2005). The term could also defined as an "individual's attitude towards a set of objects, typically reflected in an explicit decision making process" (Lichtenstein & Slovic, 2006).

Why does a person prefer a traditional product over a modern one or vice versa? Also, what does it imply when a person's liking for an object does not lead to purchase? This study aims to investigate the cross-cultural effects on the perceived value of affective quality in designed objects. Its investigations explore the implications of cultural commonalities and differences to improve the design process for a value-based, user-centered modern design.

Hence, the main thesis aim is to:

*Understand cross-cultural effects on the perceived affective value and preferential attitude evoked by visual impressions of African and Japanese designed objects through cognitive style and semantic evaluation tests.*

To achieve this main goal, the thesis has two specific sub-objectives:

- 1. To explore links between aesthetics in the African design context and Japanese design context;*
- 2. To understand through visual stimulation, cross-cultural variations of perceived aesthetic value and sensibility towards African and Japanese designed objects.*

In order to accomplish the set goals of the study, quantitative and qualitative data were collected in a sequential and composite manner. Surveys and tests were conducted through questionnaires, and empirical observation through categorization and visual aesthetic evaluation tasks.

## **2.2. Scope of the Study**

Having observed that previous *kansei* studies which have aimed to explore cross-cultural perspectives in design characteristics and perceptions are limited to Asia and Europe and within a common framework of the oriental and occidental cultures, this thesis aims to push the frontiers of the study of *kansei* to Africa. Japan is the epitome of the mutual development and hybridization of both traditional craft and contemporary designs. This could serve as a point of reference for Africa, where most countries have yet to thrive in adapting traditional crafts into modern design contexts.

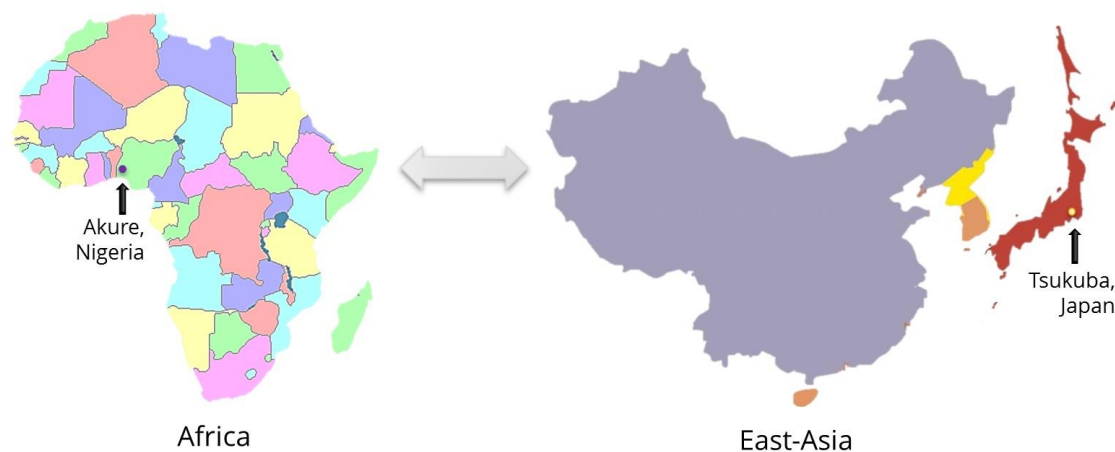


Figure 8: Focused geographical areas of the study in Africa and East Asia

Asia, followed by Africa, is currently the world's largest and most populous continent. With approximately 4.3 billion people, Asia has shown a high growth potential in recent times, both in terms of population and economy. For instance, during the 20th century, Asia's population nearly quadrupled. (Google data, 2014). Despite the lingering effect of its colonial past and other myriad of challenges, Africa (with a population of about 1.1 billion in 2013) is projected as an epicenter of the 21st century's geo-economic growth because of vast untapped resources. Many countries in Asia, and particularly East Asia, are one of the most active trade partners with African nations. The concept of "South-South trade" typifies the recent boom in commerce between Africa and Asia. This growing bilateral relationship holds a significant reason for fostering cross-cultural research between the two regions. It is observed that Africa has been under-researched and for real and sustainable growth to occur across the continent there must be a refocus and commitment on research development. This will include drawing upon developmental strategies and successful models of the advanced economies.

The preliminary research of the study gathered participants from various African countries (mostly nationalities from the sub-Sahara region) and East Asia, mostly from Japanese. However, for the primary research, the cross-cultural comparison was limited to Japanese and Nigerian<sup>13</sup> participants (cf. Figure 7). A population sample was selected

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<sup>13</sup> A recent report by Linklaters LLP, a global law firm, indicates a strong economic relationship between Japan and Nigeria. It is claimed that Japan ranks as the most active Asian project finance sponsor in Africa. Also, it is estimated that over thirds of all

from students enrolled in a national university. The Japanese participants were primarily students attending the University of Tsukuba, located in Tsukuba city, Ibaraki Prefecture, Japan. The Nigerian participants were composed of students attending the Federal University of Technology Akure, in Ondo State, South West Nigeria. Their educational background covers both design and non-design fields. The students' age ranged between 18 and 35 years, and included both males and females.

### **2.3. Structure of the Thesis**

The structure of this thesis, as outlined in Figure 8, shows a holistic view of steps taken towards accomplishing the aim and objectives of the study. The main content is sectioned into five parts (A-E), each of which describe key aspects of the thesis, starting from the background, and ending with its conclusion. The following list presents the basic content of each part to describe the essence of the thesis:

- Part A (current part) introduces the thesis. It reveals its rationale and contextual problem within which the thesis needs were identified as an opportunity for a *kansei* study based a cross-cultural approach. Under section 2 above, the main objective and goals of the research are presented with a view of the scope. In section 3 below, the research method, assumptions and design are also introduced. Part A provides the foundation for fundamental concepts that contribute to the thesis design, development and interpretation.
- Aesthetics, which constitutes a key concept in this thesis, still appear rather elusive within the domain of *kansei* science. The second part, Part B, attempts to elucidate relevant theories surrounding key terms while at the same time situating them within a cultural context of African and East Asian designs. This part also describes aesthetics in relation to *kansei*, as both concepts are affective constructs in today's trend of design. This discourse contributes to the on-going discussion of important themes in the *kansei* research community, and also provides a theoretical framework upon which the rest of the thesis work is constructed.

- The Part C delves into the thesis' preliminary research stage. It covers two exploratory approaches taken: First, a case survey on aesthetics within the scope of African design and second, a cognitive style test for Africans and East Asians. The concept of this pilot research, including the methodological procedures adopted, contribute toward setting a clear path towards the main part of the thesis. In particular, Part C explains the data collection, test procedures, stimuli preparation, statistical data analysis, results and key findings from the case survey and cognitive style test by characteristic tendencies of categorization of natural and artificial objects.
- In Part D, the main body of research for this thesis is presented. It focuses on an investigation based on user-product evaluation that was primarily adopted from the evaluative scales of SD by Osgood et al. (1957). This research was conducted under two phases – Product Evaluation Test I and Product Evaluation Test II. This research intends to examine the aesthetic value cognition and preference towards culture inspired product designs. While the first part of the study purposively selected fifteen (15) product samples with African design origin for user evaluation, the second part adopted a wider range of product samples with African and Japanese design origins. Overall, the chapter describes the test procedures, stimuli selection, analysis of data, results and key findings from the semantic evaluation of selected African and Japanese product samples.
- Finally, Part E cuts across the preceding parts to summarily gather the thesis' key findings to reach a general conclusion and highlight its future prospects.
- The appendix presents additional information and materials relevant to the data gathering for the thesis.

### **3. RESEARCH METHOD**

#### **3.1. Assumptions**

The purpose of experimental design for this thesis is to understand factor effects and to make predictions. Understanding how much effect a factor has on the user's perception can help designers understand how the human aesthetic works across cultures. This is especially true when the effects of interactions between factors are understood. Interactions are often the key to interpreting otherwise confusing results.

Since the concept of culture is pivotal to this study, it is important to clarify the operational definitions of 'culture'. This study has taken a stance on the dynamic constructivist approach towards explaining culture proposed by Hong and colleagues (2009). This definition is more comprehensive and can serve to support the methodical approach adopted for the study. As further described under the theoretical framework of the dissertation, culture is accepted to exist within two layers of the society: material and non-material (Gerber & Macionis, 2011; Christopher Tilley, 2006; Woodward, 2007). The material level is the aspect where culture is viewed more as a visual or semiotic language of communicating meaning. This is typically manifested as the artifacts or physical objects of a particular group or society. On the other hand, the non-material aspect of culture is the intangible layer of meaning. This aspect of culture is deeply rooted and connected with assumptions, values, belief systems, institutions, conventions, philosophy, norms, language, attitudes and behavior. The study considers the people of a particular country (e.g. Nigeria) or region (e.g. Africa) as representative of a distinct 'cultural groups' who share a common system of worldview and value. The study does not intend to use 'culture' in the sense of national or geographical borders. Rather a 'nationality' would mean a 'cultural group'. East Asia, as well as Africa, clearly stands as distinct cultural units which have common sets of values. This is typically illustrated by the Inglehart–Welzel World Value Survey Cultural Map as presented in Inglehart & Welzel (2005, 2010).

Following several studies done by cognitive psychologists (for example in Nisbett et al 2001, Nisbett 2003, Nisbett & Miyamoto 2005), the East Asian societies have been persistently referred to as a 'collectivistic' society. While it seems that Africa might share the Western trait of 'individualism', little research has been conducted to establish

the actual characteristics of its diverse societies. Therefore, in the preliminary phase of the study, an attempt was made to compare the African and East Asian cultures on a basis of generic difference/communality at a regional level. This is not arbitrary but rather exploratory. However, the advanced part of the research focused more on specific African and East Asian societies (Nigeria and Japan). In the pilot research for the cognitive style comparison between African culture and East Asian culture, this study considered only Japanese participants as a representative sample of the East Asians' cognitive style attribute. This was based on the premise that several previous studies have established the similarity of cognitive styles existing among the East Asian societies. However, in the latter part of the thesis, there is a focus on comparing a single national unit within African culture (Nigeria) with the Japanese culture.

One of the main objectives of this thesis is to explore the possibility of understanding implicit value in traditional and modern day oriented design, which could be adapted for value creation for future designs. For design, value-adding with cultural aesthetics can enrich the core of product value, while as the same time push cultural development forward and connect the past to the future design. Therefore, when the issues of cross-cultural sensitivity are considered in design, the influence of culture in the construction of product value and meaning can become more visible and harnessed towards innovative product design. For example, the research that led to the development the World Value Survey Cultural Map<sup>14</sup> by political scientists Ronald Inglehart and Christian Welzel clearly indicates how values can coalesce and differentiate global cultures (Inglehart & Welzel, 2005, 2010). Also notable is the pioneering study of the Dutch social psychologist, Geert Hofstede, on cultures across modern nations. The Hofstede's cultural dimensions theory<sup>15</sup> is a remarkable development among comparative cultural

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<sup>14</sup> The *Cultural Map of the World* of the *World Value Surveys* were developed to give a comprehensive measurement of key areas of human concern covering religion, politics, social and economic life. From the findings, two dimensions dominate which are *Traditional* versus *Secular-rational* and *Survival* versus *Self-expression* values. The two maps show how scores of societies are located on these two dimensions over a time shift (1999-2004 and 2005-2008). Moving upward on the map reflects the shift from Traditional values to Secular-rational and moving rightward reflects the shift from Survival values to Self-expression values.

<sup>15</sup> In Hofstede's explanations of dimensions of national cultures, *PDI*- "Power distance is the extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally;" *IDV*- Individualism vs Collectivism means "The degree to which individuals are integrated into groups"; *MAS*- Masculinity vs. Femininity means "The distribution of emotional roles between the genders"; *UAI*- Uncertainty avoidance index implies "a society's tolerance for uncertainty and ambiguity"; and *LTO*- Long-term orientation vs. short term orientation "describes societies' time horizon". For instance, "Long-term oriented societies attach more importance to the future".

studies that describes the effect of a society's culture on the values of its member and how these values impact on behavior (Hofstede, Hofstede, & Minkov, 2010).

### **3.2. Research Design**

This study took an exploratory and interpretive approach to understanding the characteristic difference of perception and aesthetic appreciation of traditional and modern value in design artifacts. Using both quantitative and qualitative methods, the study seeks to provide insight into the points of convergence and divergence in the pattern of perceptions of traditional and modern value in design artifacts based on a cross-cultural product evaluation. The framework for this study is situated within the fields of *kansei* science and *kansei* design. It has sought to adopt established and specific instrument for measuring perception emotion and semantics. While measurement approaches may vary among *kansei* disciplines, this research has explored well established *kansei* and psycho-cognitive evaluation toolkits and instruments - including SD and SAM (Self-Assessment Manikin), to collect and measure participants' responses. By attempting to identify how individuals within cross-cultural setting respond to a combined set of stimuli within a construct of aesthetics, preference and variables of product trendiness, the study investigates into cultural influence on the perception based on different cultures.

To reach the aim of the research objectives, the following tasks were methodically carried out in two (2) stages:

1. Preliminary Study (Case Survey and Cognitive Style Test)
2. Main Study (Product Evaluation Tests)

Figure 9 below presents a synthesis of the methodical procedures and main research instruments adopted for the thesis. In addition, an overview of the research components is summarized in Table 2.



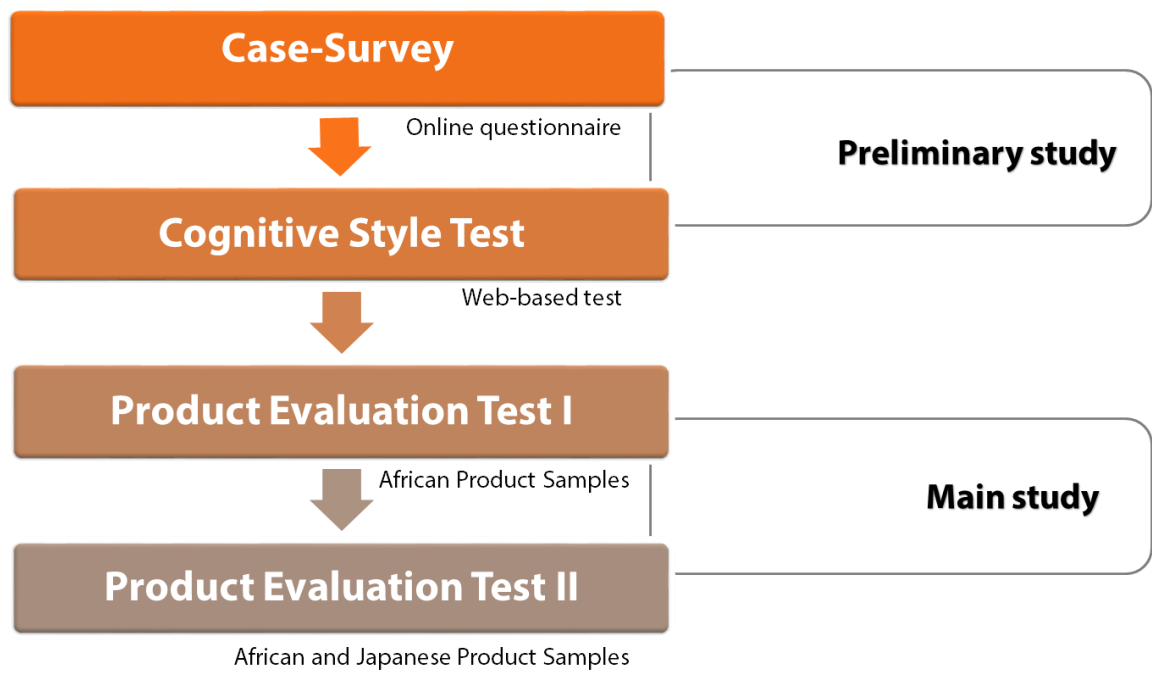


Figure 9. A synthesis of research procedures

### 3.2.1. Preliminary Study

#### 3.2.1.1. Case Survey

Target: To explore the possibility of understanding the influence of culture on perception by aesthetic evaluation of design artifacts.

Measure: Electronic mail and web-based questionnaire survey.

Participants: African professional designers.

#### 3.2.1.2. Cognitive Style Test

Target: To examine the cognitive distance between an Asian culture (Japanese) and an African culture (Nigeria), to understand the difference (distance) in the cognitive style and thinking attribute.

Measure: Categorization tasks with an adapted method from Chiu's (1972), Ji's (2004), and Park & Yamanaka's (2011) cognitive style tests.

Stimuli: Word triads of natural and artificial objects.

Subject: African and Japanese participants.

### **3.2.2. Main Study**

#### **3.2.2.1. Product Evaluation Test I**

Target: To understand through visual stimulation the cross-cultural effects on perceived aesthetic value and sensibility towards African inspired designed objects. In other words, to study the cultural characteristics of value cognition in traditional and modern design through an aesthetic evaluation of products with African creative origin.

Measure: SD.

Stimuli: African inspired products

Subject: African and East Asian participants (Design and non-design university students).

#### **3.2.2.2. Product Evaluation Test II**

Target: To understand through visual stimulation the cross-cultural effects on perceived aesthetic value and sensibility towards African and Japanese inspired designed objects.

Measure: SD.

Stimuli: African and Japanese inspired products.

Subject: Japanese and Nigerian participants (Design and non-design university students).

Table 2. An overview of research components

	Phase 1		Phase 2
	Case Survey	Cognitive Style Test	Product Evaluation Tests
Objectives	To explore links between aesthetics as a socio-emotional factor in the African design context and <i>kansei</i> as an affective element in today's Japanese design craftsmanship culture	To explore at a deep cognitive level the difference of perceptual style between African and East Asian cultures	To understand through visual stimulation the cross-cultural effects on perceived aesthetic value and sensibility towards African and Japanese inspired designed objects
Methodical approach	Case survey Logical/ Argumentative Approach	Cognitivist approach	Psychometric measurement
Preliminary research	Survey on aesthetic element in African design and Japanese <i>kansei</i> awareness (Case study and multi-choice on-line questionnaire)	Preliminary cognitive style test	Product Evaluation
Participants/ Data source	Preliminary survey 20 participants (African design practitioners); Theoretical exploration and scholarly inquiry into existing models and frameworks on aesthetics and <i>kansei</i> in design	Web-based test 70 participants (35 Japanese - 60% Male) (35 African nationalities - 57% Male); Main evaluation 158 university students - Japan and Nigeria (58 Japanese participants) (100 Nigerian participants)	Product Evaluation I 40 participants (20 African nationalities) (20 East Asian nationalities); Product evaluation II 158 university students (58 Japanese participants) (100 Nigerian participants)
Stimuli selection		Web-based test Categorization tasks based on Chiu's (1972), Ji's (2004), and Park & Yamanaka's (2011) cognitive style tests	African product samples (15 visual stimuli sets – preset into traditional, semi-modern and modern categories); Main evaluation Adapted stimuli set from the preliminary test with

			<p>one additional sample.</p> <p>Extended range of stimuli to include selected Japanese product samples (17 visual stimuli sets).</p> <p>Japanese product samples were selected by 14 students with advanced design backgrounds</p>
Research instruments	Theoretical inquiry	Similarity judgment tasks based on Analytic/Holistic and Attribute/Relationship orientations	SD scale; Mood scale – (SAM)
Findings	<p>Aesthetics in the context of African design seemed to be relevant to Japanese <i>kansei</i> in design. The appraisal of aesthetic function (<i>kansei</i> factor) and culture in modern African design relates mostly to attractiveness, and beauty.</p>	<p>The Japanese participants tend to show more tendencies for holistic way of thinking than the African participants. However, there was not enough evidence to establish the test assumption.</p>	<p>Overall, there were indications for both cultural proximity (points of convergence) and distance (points of divergence) between African and East Asian cultures.</p>

## 4. THEORIES AND CONCEPTS

### 4.1. Introduction

This chapter was developed as an attempt to build a theoretical framework as a systematic approach towards reconciling the expanding theory of *kansei* with *aesthetics*. This review process also aims to strengthen a model of aesthetic perception in product design advanced by this thesis. By exploring the connection between *aesthetics* and *kansei* as an affective element in Japanese design culture, the discourse hopes to provide a foundation upon which the rest of the research work is constructed. Ultimately, since the concept of aesthetics stands as a more familiar construct to the international design community, interpreting the value of aesthetics could provide more insight towards grasping the complex nature of the aesthetic value cognition.

#### 4.1.1. *Aesthetics* – Core Perspectives from Various Fields

The term *aesthetics* was originally derived by Alexander Gottlieb Baumgarten in 1735, which he concisely defined as the “science of sensuous cognition” (in other words, the *science of sensory perception* or *perception by means of the senses*). Nagashima et al. (2012) relate on another description of aesthetics by Baumgarten as the “study of aesthetic recognition and its presentation,” raising a question of what “aesthetic recognition” actually means. In the account given by Cinzia & Vittorio (2009), Baumgarten’s proposition in his unfinished book *Aesthetica* (1750) expanded that: “a new discipline, aesthetics, should investigate feelings and sensations for the purpose of arriving at the goal of poetry, which is perfection – beauty.” It appears that Baumgarten’s major research concern was poetry. However, it is also assumed that his study did not intend to focus only on poetry, but to eventually encompass all the arts through the concept of *cognitio-sensitive* (sensitive awareness) (Koren, 2010; New World Encyclopedia, 2013).

Drawing down from Baumgarten’s study and subsequent works by Immanuel Kant<sup>16</sup>, the phenomenology of aesthetics is related through the description and explanation of

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<sup>16</sup> In *Critique of Pure Reason* (1781), Kant argued that Baumgarten’s *aesthetics* defies objectives rules or principles of natural or artistic beauty. However, in his later work, *Critique of Judgment*, Kant admitted Baumgarten concept and adopted the word aesthetic to mean the judgment of taste.

beauty by means of philosophy, psychology, sociology, ethnology and history. As a branch of philosophy, aesthetics denotes the nature of beauty, art, and taste with the creation and appreciation of beauty (Merriam-Webster, 2012). Within the framework of value theory or axiology, it is held as the study of sensori-emotional values, sometimes called judgments of sentiment and taste (Zangwill, 2007; New World Encyclopedia, 2013). A common thread that binds the philosophical position on aesthetics as a phenomenon is the perception, production, and response to art, as well as interactions with objects and scenes that evoke an intense feeling, often of pleasure/ displeasure (Cinzia & Vittorio, 2009; Chatterjee, 2010).

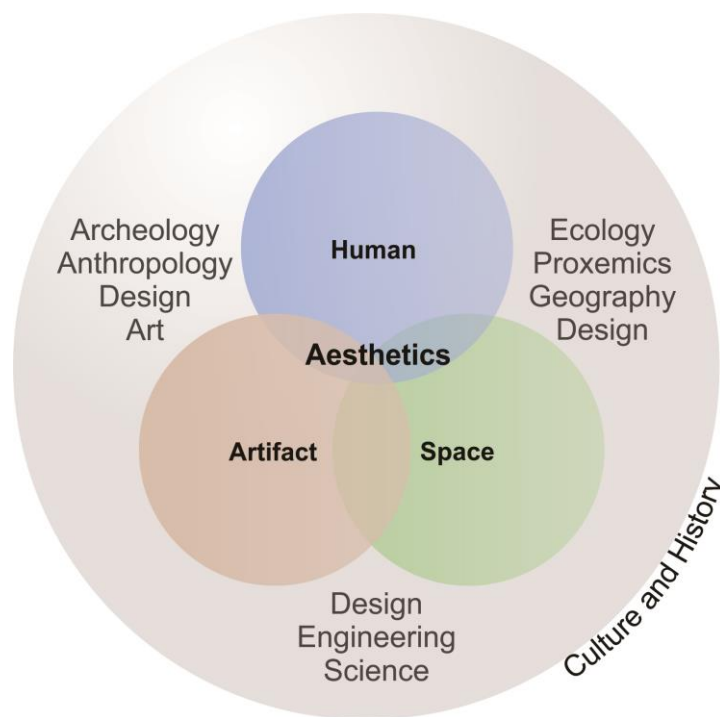


Figure 10. Aesthetics connects sphere of human, artifact and space

Aesthetics is one of the most important theories concerned with interactions involving human(s), artifact(s) and contexts (Lévy & Yamanaka, 2009). Significantly, the aesthetic aspects of products have been used in *kansei* studies which seek to quantify peoples' perceptions of artifacts.

Until now, aesthetic(s) within the field of theories and metaphysics still seems to lack a defined disciplinary border or unified definition. Hence, the meaning can be multilayered, subjective, culturally dependent and fluid among fields of discipline (as illustrated in Figure 10). In a broad sense, the term *aesthetic(s)* has been applied to designate a branch of philosophy, a feeling of pleasure, an experience, classicism in art, a judgment of taste, the capacity of perception, a value, an attitude, the theory of art, the

doctrine of beauty, a state of the spirit, contemplative receptivity, an emotion, an intention, a way of life, the faculty of sensibility, a type of subjectivity, the merit of certain forms, the quality of an object, or an act of expression (Mandoki, 2007; Ford, 2009; Jacobsen, 2010). While it appears that there are several theories on aesthetics with multifarious subjective interpretations, the subject has often been classified into two parts: first, the philosophy of art, second, the philosophy of the aesthetic experience and character of objects (non-art phenomena) (Budd, 1998). The recurrent theme addresses the standard and theory of beauty, taste, pleasurable values appreciable through sensory, emotional or intellectual perception. From a neuro-psychological standpoint, aesthetic experience touches on cognition and emotion; it incites our sense of judgment and influences our behavior. Overall, a relevant definition used by this thesis comes from Koren (2010): “aesthetics or the aesthetic is a cognitive mode in which you are aware of, and think about, the sensory and emotive qualities of phenomena and things.” Aesthetic judgment, including emotion and behavioral responses, is seen as a subjective reaction based on the quality of sensory perception and internal feeling of pleasure or displeasure. Figure 11 describes the processes in aesthetic experience as proposed by Leder and colleagues. It illustrates that the internal processes that leads to aesthetic judgment when a person is engaged with an object of aesthetic interest within a particular context.

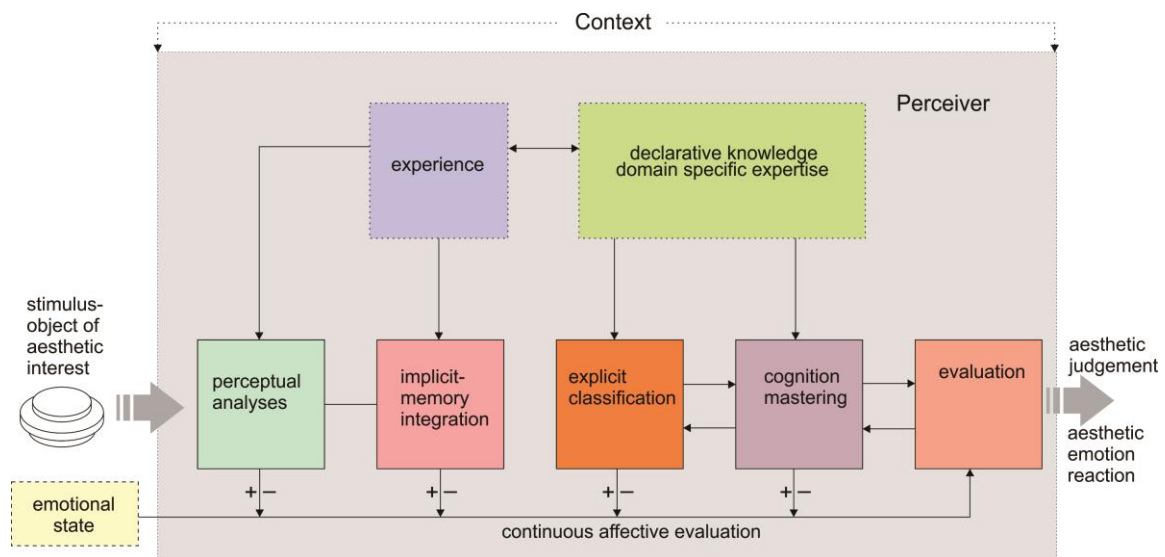


Figure 11. Schematic representation of aesthetic experience.

(Illustration adapted from Leder et. al (2004))

#### 4.1.2. (Re)Interpreting Aesthetics in Product Design

“Good design is aesthetics” as principled by the famous German designer Dieter Rams (Vitsø, n.d.). Though aesthetic pleasure might not be an emotion in itself (P. Hekkert, 2006), aesthetic perception touches on emotion in far-reaching ways; it molds our affection with everyday things (Norman, 2004a, 2004b). Likewise, aesthetic experience has transcended the limit of just sensing a product cover or getting obsessed with form, and has evolved as a functional quality in the human-product interaction (Hummels & Overbeeke, 2010; Ross & Wensveen, 2010). On the other hand, aesthetic appreciation cannot only be promoted by the acuity of visual sense, but by responsiveness of the human cognition to interpret quality, to the signs or symbols that users find truly meaningful (Ross & Wensveen, 2010). Aesthetics is also therefore considered a cognitive and emotional sense of product form, appearance, function and meaning.

There are variegated inspirations of aesthetics that all contribute to enriching the product experience. This can be materialized through product appearance, semiotic, interaction, meaning, and combinational usage of materials. Lévy et al. (2007) suggested that these factors were categorized under three major groups: the elementary factors, the complementary factors and the induced factors. The complementary factors, which include the environmental and emotional aspects of artifacts, are recognized by the designer as significant concerns to the design work. Salem et al. (2009) posited that aesthetics has four key components – beauty, pleasantness, emotion and satisfaction. These experiences could result from exposure to a perceivable form (sensation of product appearance), the performance of an action (interaction with products) or simply a mental experience (cognition).

Through this study, an integrated view of product aesthetic qualities was proposed based on the following interconnected three levels of perception (illustrated in Figure 12):

- *Surficial (superficial) aesthetics* – In first contact, the appearance of product unconsciously intrudes upon the senses of a user. However, the sensation of the image only transpires as far as the observer is interested in sustaining his/her attention on the object. The external parts of a product, which is the platform that exhibit tangible design elements such as shape, form, color, texture, smell, sound and



other physical quantities that can be detected and received via the sensory interfaces. Also the representations of the intangible design elements such as style, contrast, symmetry, harmony, rhythm are also received from the product appearance. The ease of processing all these sensed elements based on factors such as complexity, *prototypicality*, familiarity could influence the level of attention or shift beyond the receptive field for further mental processing.

- *Functional (interactive) aesthetics* – When the use of products engages the user in a pleasurable way, aesthetics becomes a function. Likewise, when the operation of a product or system evokes pleasurable experience, which makes to improve the use and performance of a product, this could be relayed to as the functional dimension of aesthetics.
- *Symbolic aesthetics* – Pleasure evolves in reflecting meaningful association with the product. This is a level of aesthetic experience where consciousness, emotion and other cognitive functions are fully engaged. This aspect of products possesses intangible qualities that touch on users' self-image, taste, memory, preference and so on. This aspect is highly subjective, personal and susceptible to variability through experience, culture, education, and personality.

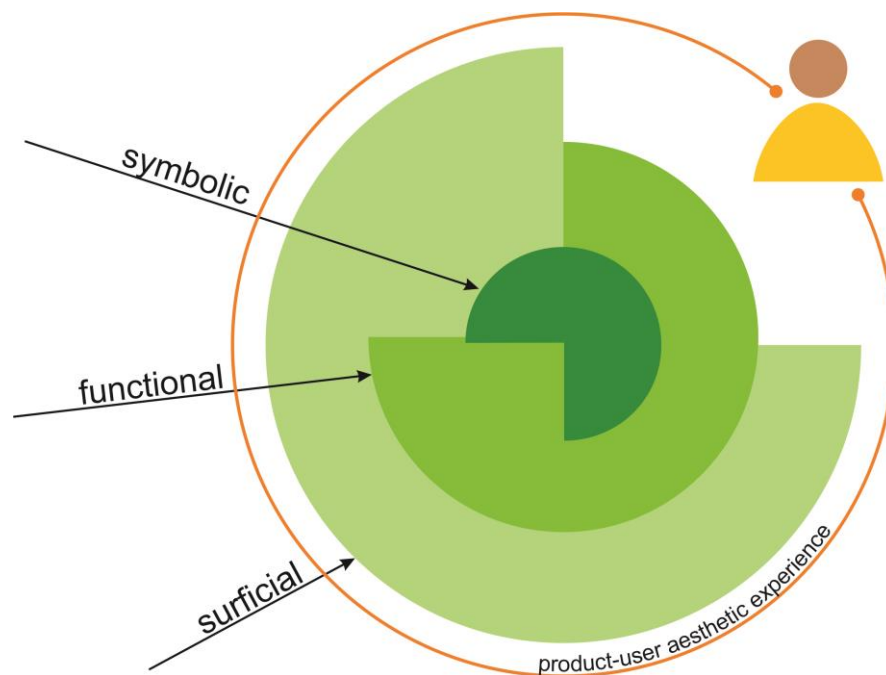


Figure 12. A proposed model on layers of aesthetic perception in designed objects.

Following the investigation by Moalosi (2007) about the emotional socio-cultural factors associated with the Botswana's indigenous products, it was inferred that the emotions attached to these products is a synthesis of the impact of the physical qualities of the product (superficial aesthetics), the performance of that product (functional aesthetics), the knowledge it generates, or the message it conveys (symbolic aesthetics). This study views aesthetics as the intrinsic and extrinsic dimensions of product qualities based on the existence of universal and timeless principles of expressing beauty; which is modified within a culture and across cultures.

## 4.2. Cultural Contexts

### 4.2.1. Introduction

Culture provides context for meaning and it can be expressed both at a *material* level or a *non-material* level of the society. The material level is the tangible aspect where culture is viewed more as a visual or semiotic<sup>17</sup> language of communicating meaning. Material cultures are typically manifested as artifacts and products of a particular group or society<sup>18</sup>. They serve as concrete or visible medium of communicating meaning, identity and symbolic expressions. Cultural meaning can be embedded in products through design attributes (e.g. design elements such as form, shape, color, line, material etc. These attributes are organized by design principles such as balance, symmetry, variety etc.) and features (given by Hassenzahl (2003) as *content*, *presentation style*, *functionality* and *interactional style*) which the designers try to organize to define a product's character (e.g. modernity, novelty, simplicity, innovation, etc.). In other words, when the product attributes and features are effectively chosen and combined by the designer, a product's visual composition can communicate an intended concept that aligns with the users' values and are rightly perceived by them. On the other hand, the non-material aspect of culture is the intangible layer of meaning. This aspect of culture is deeply rooted and connected with assumptions, values, belief systems, institutions, conventions, philosophy, norms, language, attitudes and behavior.

The aesthetic quality of a product can be inspired by cultural values and communicated to the users through design configurations. Hence, aesthetics has become

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<sup>17</sup> According to Merriam-Webster Concise Encyclopedia, *Semiotics* is described as the "study of signs and sign-using behavior, especially in language". It ascribes the concept as the work of Ferdinand de Saussure and Charles Sanders Peirce in the late 19th and early 20th century, which led to the emergence of semiotics as a method for examining phenomena in different fields, including aesthetics, anthropology, communications, psychology, and semantics. (Accessed from <http://www.merriam-webster.com/dictionary/semiotics> on the 30 November, 2014)

<sup>18</sup> Today, aesthetic qualities can be integrated in every layer of product experience and relevance. They are among the core factors considered by designers in driving product novelty, product acceptance and attractive product image. Hence, the manifestations of culture in product design transcend a mere surface treatment leading to aesthetic stereotypes such as the national shape or color.

a platform for communicating values to the users, either in tangible or intangible forms. It is often instrumental to the integration of core components of culture in design of products. The two aspects of culture illustrated above – material and non-material – can be intertwined. Particularly for practical application, the material aspect is harnessed to communicate, reflect or evoke the emotive quality of the non-material aspect of culture. The design of the E6 series Japanese *Shinkansen* (high-speed train) operated by East Japan Railway Company since 16 March 2013, is an example of this phenomenon can be reflected in the real world (cf. Figure 13). The train has an overall styling which was intended by the designer Ken Okuyama, to evoke images of the *Namahage* 生剥 demons (a demon-like being in traditional Japanese folklore) and Kanto festival lanterns for which Akita Prefecture is popularly known for. In Akita, *Namahage* traditional mask is used in a festival context, to encourage good social behavior among young children. This is a typical example of modern aesthetic expression of non-material cultural values through material medium.

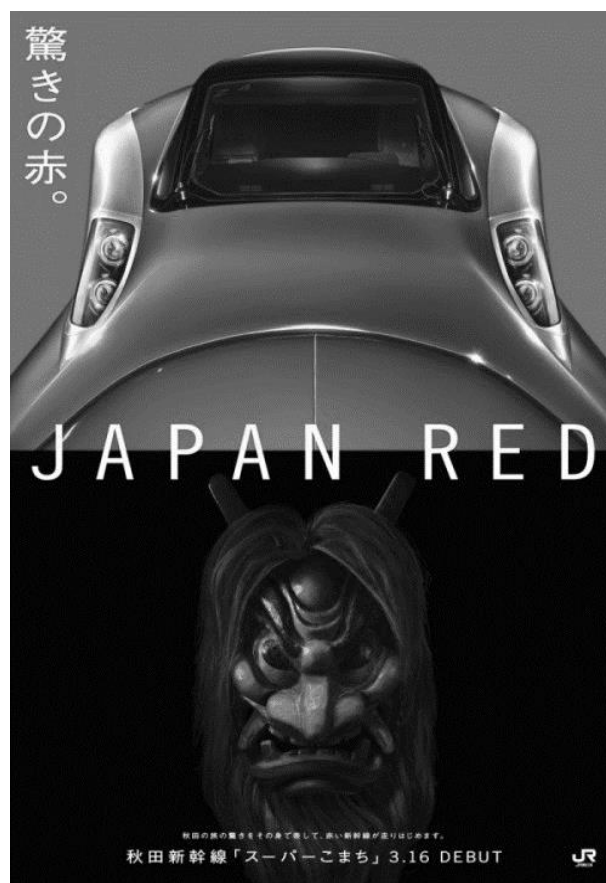


Figure 13. An official poster of the official debut of the E6 series Japanese *Shinkansen*

(An online image retrieved November 1, 2014 from  
<http://www.kenokuyamadesign.com/main/?m=201304>)

This study acknowledges several preceding studies and perspectives that have similarly adopted a descriptive approach to defining culture<sup>19</sup>. However, for the purpose of delineating some fundamental assumptions reflected across a broad and divergent spectrum of existing definitions, the *dynamic constructivist* approach adopted in cultural psychology towards explaining culture, expounded by Hong (2009) and colleagues, will be emphasized. These assumptions summarily posit that culture is:

- a) “shared (albeit incompletely) among a collection of interconnected individuals, who are often demarcated by race, ethnicity or nationality;
- b) externalized by rich symbols, artifacts, social constructions, and social institutions [...];
- c) used to form the common ground for communication among members;
- d) transmitted from one generation to the next or from old members to the new members;
- e) undergoing continuous modifications as aspect of the knowledge tradition may be falsified or deemed not applicable by newer social order or reality.”

According to Hong (2009), a redefinition of culture as “networks of shared knowledge” conflicts with the common treatment of culture as the “deep-rooted essence of certain groups”. Rather it clarifies that the “causal potential of culture does not reside in the racial, ethnic, or national groups, although, these groups are carriers and agents of cultures”. The “networks of shared knowledge are activated in a probabilistic (vs discrete or categorical) manner within certain ethnic or national groups in certain social contexts”. In other words, the “causal potential of culture resides in the *activation* of shared cultural

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<sup>19</sup> Kluckhohn (1951) describes that culture strongly relates to “values that pervade the historically derived ideas that form a particular tradition. These ideas and values create patterned ways of thinking, feeling and reacting, which constitute the distinctive character of a human group”. Essentially, culture as totality of all the knowledge and ideals shared by a society, is dynamic (Hong, 2009) and multilayered (Hofstede, 1984; Schwartz, 1992; Triandis & Hofstede, 1993; Moalosi, Popovic, & Hickling-hudson, 2007). According to Lee & Harada (2000), researchers agree upon the theory that culture consists of portions that differ from each other in the degree of observability, tangibility, and consciousness but do not quite agree upon the number of layers and terminology describing each layer. The top layer of culture consists of the observable reality of artifacts and behaviors that are the expressed symbols of a deeper layer of culture. The bottom layer of culture consists of invisible elements in peoples' minds beyond conscious awareness, and taken for granted. This theoretical model of culture shows that complete understanding of culture requires one to look at not only surface levels of observable culture but also bottom levels of unconscious culture. The top layer of culture mirrors bottom layer and, in turn the bottom layer originates from the top layer.

knowledge, which brings about affective, cognitive, and behavioral consequences”. Figure 14 illustrates a simple representation of a four steps approach to studying cultural influences in cultural psychology.

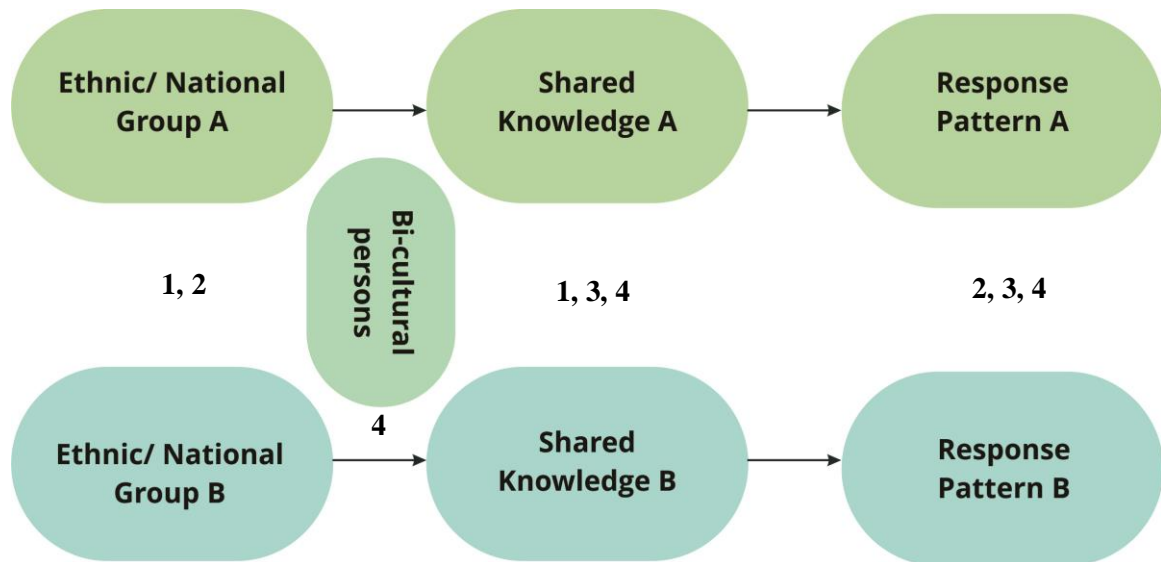


Figure 14. A methodological approach to studying cross-cultural effects by Hong (2009).

Based on the dynamic constructivist model, Hong outlines four steps (denoted with numbers) as specific component in studying cultural influences. First, to identify the prevalent knowledge (values, beliefs or lay theories) widely shared by two cultural groups. Second, to examine the differences of shared knowledge endorsement. Third, to establish the causal role of shared knowledge. Fourth, to examine the dynamic switching of shared knowledge within the mind of bi-cultural individuals.

For design, value-adding with culture meaning can enrich the core of product quality and perceptual richness, while as the same time, pushing cultural development forward and connecting the past to future design. When the issues of cross-cultural sensitivity<sup>20</sup> are considered in design, the influence of culture in the construction of product value and meaning can become more visible and harnessed towards innovative product design. Since product designs are seen as a tool of cross-cultural understanding, the growing need to have better understanding of cross-cultural perception will have a far-reaching effect for the global market. Likewise, this will play an important role in engendering untapped potentials for globalization of local product designs.

<sup>20</sup> Local design and manufacturing industries stand to compete favorably in the global market by recognizing the specific needs and cultural orientation of the consumer market for which they are designing. Yamada (2006) gave the following instance. During the Meiji and Taisho periods, Japan's pottery industry took the path of export-oriented industrialization by shifting from Japanese style products to Western-style tableware. Export-oriented industrialization was also spurred by the addition of daily-use ceramic products to the traditional line of artistic pottery. This underlies the tremendous economic success that affected a dramatic increase of export and total production output of Japanese pottery products as early as the 1900s.

The East Asian and African cultures reflect rich aesthetic traditions that are rooted in historical meanings and evolved lifestyles. Following a global trend in product design market, there has also been a growing economic interaction among these cultures as indicated by recent global trade index by the United Nations Conference on Trade and Development (UNCTAD, 2014a). It is believed that these emerging trends could hinge on crucial points of convergence in socio-cultural value. Thus, exploring aesthetic value as a shared knowledge between Africa and East Asia would be relevant to understanding cross-cultural effects on perception and emotional experience with cross-cultural designs.

#### **4.2.2. Aesthetics in African Design Cultures**

African design cultures are diverse and rich; yet, the connection that runs through most African styles was supposed to be traditionally rooted, spiritually meaningful, contextual and diversified, materially natural, and visually vivid. In general, they have a deep-rooted tradition of aesthetics, which have often been related to the development of arts and crafts. Thus, within the purview of material culture, the African aesthetics manifest themselves well through visual traditional expressions. Molokwane (2007) arguably presents African aesthetics as “a socio-psychological and anthropological phenomenon from which we can learn how different paradigms to inform our design thinking”. This comment was based on the observation of the people, and the typical objects with which they interact on a daily basis. Unlike Western culture where aesthetics might be well linked to utility value, it has been noted by Molokwane (2007) that the African aesthetic appreciation tends to show a strong inflection of ethnical, religious beliefs and values. Therefore, African words signifying aesthetics or a sense of beauty can be intertwined with the good, proper and appreciable. This conception, however, seems to resonate with the Greek word for aesthetics, “*to kalos*,” which also means the beautiful and the (morally) good. Another interesting dimension is the concept that African aesthetics can be expressed materially or symbolically in culturally inspired products. The impact of westernization and colonialism might have brought about a diluted taste and varied sense of aesthetic perception in Africa, however, traditionally, there are clearly stated and common standards of beauty across most of Africa’s tribal societies. However, the unifying components of aesthetic appreciation include *togetherness*, *craftsmanship*, *symbolism*, *anthropomorphism*, *self-composure*, *luminosity* and *youthfulness* (Susan, 1986; Willet, 1993; Belton, 1998; Molokwane, 2007).

Despite having a traditional background, which is often regarded as craft-based, African design is evolving into modern design expressions and developing product finishing suited for modern taste (cf. Figure 15). Besides function and cost, aesthetics has been identified as a strong element and emotive sociocultural factor traversing its product development. Though the emerging trend of design seems to be influenced by Western design approaches, curricular models and tools since the middle of the twentieth century, African designers are still cognizant of preserving Africa's cultural identity in product styling and aesthetics.



Figure 15. Trends and visual design expressions in African inspired products

In the face of globalization and post-colonialism, the fusion of modern traditional aesthetics with modern product design will create a competitive edge in a global market. In the new age of African design, South Africa, which is a highly industrialized country in Africa with much Western influence, started exploring a way of grafting the African

identity onto Western European technology towards a new synthesis (SABS Design Institute, 2010). One of the product manifestations of this trend is the SABS (South Africa Bureau of Standards) award winning Hippo water roller (shown in Figure 16) originally invented by Pettie Petzer and Johan Jonker in 1991.



Figure 16. The Hippo water roller

(An online image retrieved January 26, 2014 from <http://www.hipporoller.org>.)

#### 4.2.3. Aesthetics in East Asian Design Cultures

Following an historical record of cultural influences across the region, countries in East Asia shared cultural traits which are notable till the present day. These are manifested in social philosophy, religions, political structures, and an ideographic written language. Their communality can also be observed in visual expressions in traditional architecture and other artifacts<sup>21</sup>. The dominant historical influence has been attributed to China,

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<sup>21</sup> Discovering the beauty of capital cities in East Asia countries is never a complete adventure without connecting with its dynamic mix of the tradition and modernity. Tokyo (Japan), Seoul (S. Korea), Beijing (China) and Taipei (Taiwan) are examples of cities that offer a rich experience of traditional culture in the city core, connecting the old with the new in a seamless and harmonious manner.



though in modern times, cultural exchange has flowed more reciprocally. Despite the thread of similarities, cultural diversities also exist. Ho (2001) noted that East Asian products, though plentiful, are mostly developed with Asian design philosophy; which explain the reason why they take on various shapes, forms or specific usage. A typical example of a traditional and culturally-shared product are the chopsticks (cf. Figure 17). Despite their overall similarity, chopsticks emanating from a particular East Asian culture bear a unique aesthetic quality and identity that is suited for a particular culinary habit among the Eastern cultures. The “Project Chopstick”, a collaborative and trial cross-cultural design research among several universities in Beijing and Hong Kong of PRC, Japan and Korea. It was initiated in 2006 towards understanding selected Asian people in the “Chopsticks” culture, particularly in their culinary habits at the domestic level”. This project clearly demonstrated a potentially viable approach towards exploring design opportunities in Asian cultural identity for modern lifestyle (Lam, Lee, Liu, Yamanaka, & Woo, 2006).



Figure 17 Asian chopsticks are apparently simple and everyday tools that are of an ancient origin, with diversified usage and rich meaning.

(Image source: Lam et al. (2006))

Japan, the foremost country in Asia to experience the industrial revolution, started its design movement during the Meiji period in the 1870's. It expanded during the Arts and Crafts movement following WW1 when some western dress and furniture were introduced while Japan offered its decorative goods (fans, kimonos, lacquered bowls and prints to the West (Ho, 2001; Sparke, 2009). During the 1870s and 1880s, Japan's contact

with the West and more particular through the occupation around 1945 (WW2), expose the Japanese to a Western way of life, inspiring a new design movement that developed erratically, fired by advances in technology, and sometimes resisting advancing, mirroring and reinvigorating the continuing role of tradition and spirituality in everyday life. In essence, design sparked the union between two forces - tradition and modernity. It is noteworthy that for more than half a century, Japan has nurtured a distinctive modern design culture holding firmly to tradition while simultaneously all that contemporary visual and material culture has to offer (Sparke, 2005).

Focusing on the Japanese context, the art or process of making objects (*monozukuri*) is founded on an age-long tradition of seeking harmony and balance with nature while creating things with unique techniques or skills. The way or process (*dou* 道) of making objects is historically connected to the tradition of Zen and the Confucian philosophy (Suzuki, 1973; Kanaya, 1982; Saito, Salazar, Kreamer, & Grulke, 2011). The philosophy of Japanese aesthetics in the Western sense never evolved until around the nineteenth century. However, it remains preserved as a set of ancient ideals that include *mono no aware* 物の哀れ (the pathos of things), *wabi* 侘 (subdued, austere beauty), *sabi* 寂 (rustic patina), *yūgen* 幽玄 (mysterious profundity), *iki* 粋 (refined style), and *kire* 切れ (cutting) (Parkes, 2011). These ideals, and others<sup>22</sup>, are said to underlie many of Japanese cultural and aesthetic norms related to taste or beauty. While *aesthetics* may be considered as a philosophy adapted from Western societies, the concept in Japan is actually seen as an integral part of daily life. Moreover, its essence is rooted in the idea of understanding the basic reality of constant change or impermanence which is derived from Buddhism. Today, Japanese aesthetics has transcended to include a variety of ideals; some of these are traditional while others are modern and sometimes influenced from other cultures (Miller, 1996).

Kenya Hara, a prominent Japanese modern designer leading a new movement for Asian design (House vision), names Japan's cultural resources as its traditional aesthetics, captured in four keywords: *sensai* 繊細 (delicateness), *chimitsu* 緻密

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<sup>22</sup> Boyé Lafayette De Mente in his book "Elements of Japanese Design" describes 65 elements that make up Japanese design with regards to their origin and how they are reflected in concepts and objects of contemporary Japanese designs.

(meticulousness), *teinei* 丁寧 (thoroughness or attention to details) and *kanketsu* 簡潔 (simplicity). Also, strongly reflected in among the Japanese society is a prominent value of cuteness or *kawaii* 可愛い. As noted by Ohkura, Goto, Higo, & Aoto (2011), *kawaii* has been identified as a *Kansei* (emotional) value of Japanese origin which has positive meanings, such as cute, lovable, and small. It is a contemporary cultural phenomenon traversing Japanese popular culture, entertainment, clothing, food, toys, personal appearance, behavior, and mannerisms.

The piece of Jomon pottery shown in Figure 18a is example of an anonymous artifact and a traditional craft that reflect an ancient history of Japanese design culture, lifestyle and aesthetic expression. Figure 18b shows the silver vessel was made by a traditional metalcraft technique called *Tankin*. This artifact is a traditional craft that reveals advancement in the traditional technique and a refined taste in lifestyle and aesthetic style characteristic of Japanese design today. The object also reflects the personality of the maker.



Figure 18: a) A piece of ancient Jomon-era pottery (13,000-300 B.C.). b) A silver flower vessel with design in hammered inlay named 'Sprouts' by Okayama Hoseki (1997, Heisei period).

(These items are archived at Tokyo National Museum)

#### 4.2.4. Exploring Convergence between African and East Asian Design Cultures

Coupled with a growing socio-economic relationship, it is evident that the East Asian and African cultures exhibit and share rich but distinctively different aesthetic traditions.

The distinctions in the material culture of Eastern<sup>23</sup> countries, which are expressed through craftsmanship and symbolism, can also be found in African countries though many other cultural differences might exist. Therefore this study has attempted to explore along the lines of convergence and divergence between East Asian and African cultures, based on the user cognitive style of aesthetic values in product designs. This may serve as a launching pad for *kansei* research in Africa<sup>24</sup>. Previous cross-cultural *kansei* research has mostly covered comparative study among Asian, European and American cultures. However, this study seeks to open a new frontier in cross-cultural *kansei* research based on case studies, which compare and contrast Japan and Nigeria. It is anticipated that cultural factors may play a significant role or provide a contribution to explain cultural influence on perception, cognition and meaning. Figure 19a & b contrast a Nigerian Benin mask with a Japanese Noh mask. These objects are iconic cultural objects which are handcrafted and bear forms that embody both characteristic visual beauty and reflective meaning.

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<sup>23</sup> Ho (2001) conducted an exploratory field survey that garnered evidences from around the Far East Asian countries, that the design development in Asia is related and intertwined with the larger social environment. One of the examples cited was how the Chinese have adapted the domestic machine to fit their agricultural contextual needs. Another is how the Koreans have developed their own unique "kimchee refrigerator" which cannot be found selling at any other countries to meet their cultural related gastronomic needs.

<sup>24</sup> Campbell (2008, 2013) remarks that "design history has been documented from a predominantly Western perspective and considering its underdevelopment as a discipline in Africa [...] there is an opportunity to explore design and its relevance to development at a grassroots level on the continent".

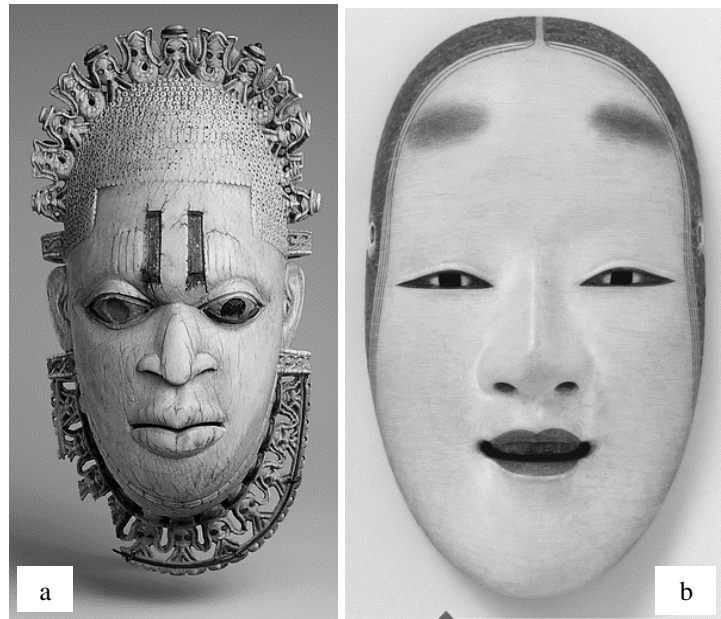


Figure 19: a) A Nigerian mask: Queen Mother Pendant Mask – *Iyoba* (Court of Benin-16th century). b) A Japanese mask: Noh Mask of *Magojiro* (Edo period- 19th century).

(Online image retrieved April 16, 2013 from <http://www.metmuseum.org/collection/the-collection-online/search/318622?=&imgNo=0&tabName=label>;

<http://www.christies.com/lotfinder/lot/noh-mask-of-magojiro-edo-period-5416298-details.aspx>)

One of the crucial gaps this thesis has identified in the current trend of design is the need to preserve and adapt the value of the fast-fading local crafts for relevance and sustained demand in contemporary times<sup>25</sup>. It is not new that globally and more particularly in the emerging economies, traditional local industries are struggling to survive under the weight of competition and technical prowess brought by the modern manufacturing industries. Despite a substantial contribution of the traditional local industries to the national domestic product (GDP), this trend holds a difficult time contending with the sustenance of these industries which are experiencing a fast decline of workforce and loss of skill and traditional knowledge due discontinuity. In recognition of this regressing situation, there has been a widespread concern of restoring and preserving the value of cultural heritage, which are more rooted in the things associated with the traditional past.

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<sup>25</sup> Yanagi (1989) shows the essence of handcrafts in an age dominated with machine-made products: “Handcraftsmanship, if it be alive, justifies itself at any time as an intimate expression of the spirit of man. Such work is an end in itself and not a means to an end. If, however, it ceases to serve a functional need, it runs the risk”.

In a global market, culture and design have become a differential point for products and a key driving force for the creative industries<sup>26</sup>. In observing the design trend in the African and East Asian societies such as Japan, cultural traditions have often served as a creative spark and original inspiration for new product development, which are deeply connected to the concept of lifestyle and idea of the maker or designer. A notable example of a creative exploration using Japanese kimono and African traditional patterns was demonstrated by an African Designer Serge Mouanguet, through his 'WAFRICA' project. This project explores along the line of creating new aesthetic language by blending typical Japanese and African traditional design cultures. It serves as a model to inspire innovative approach to cross-cultural designs in spite of differences in traditional values and identities.

Japan, being an advanced country in Asia, has demonstrated the feasibility for mutual development and hybridization of both traditional craft and contemporary designs. This could serve as a point of reference for Africa, where most countries are yet to thrive on both spectra of designs. Having observed that the East Asia and Africa exhibit and share rich aesthetic traditions, a study on the cross-cultural difference of perceptual aesthetic value in product design can act as a launch pad for *kansei* research in Africa. It is anticipated that cultural factors may play a significant role or provide a notable contribution to explain cultural influence on perception, cognition and meaning. It is speculated that the biggest challenge of African design is recognition and acceptance by the local users. African people are observed to regard what comes from advanced countries and particularly from the West and East Asia as superior in quality and look down upon what is designed locally. While most emerged and emerging economies are now emphasizing and developing their creative industries (small medium and micro enterprises), this orientation would change<sup>27</sup>. Design will have a major role to play in developing the creative industries in Africa and it will gain the recognition that it

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<sup>26</sup> The organization of cultural activities such as business or economic activities gave rise to the cultural industries. The cultural industries, therefore, are those activities which deal primarily in symbolic goods – goods whose primary economic value is derived from their cultural value. Hence, the idea of 'creative industries' has a strong connection to the creative expressions and economic concerns of the 'cultural industries'. According to United Nations Educational, Scientific and Cultural Organization (UNESCO), "Creative industries are becoming increasingly important components of modern post-industrial knowledge-based economies. Not only are they thought to account for higher than average growth and job creation, they are also vehicles of cultural diversity that play an important role in fostering cultural diversity."

<sup>27</sup> The United Nations report on Creative Economy (2010) gave a clear-cut insightful of how recently, the potency of creative industries have been engendering national economic growth and human sociocultural development through creative expressions.

deserves. It has been argued that in order for African design to successfully compete globally, it should use culture as a competitive advantage. For example, developing economies may be able to measure up with the developed economies in technological advancement, yet cultural design potentials can be harnessed as a competitive advantage and this study wish to explore this from a psycho-cognitivist point of view (aesthetic qualities as *kansei* value in designing global competitive products).

Despite being a major industrialized and fully modernized nation on a global front, Japan prides itself in promoting a society where tradition is harmoniously blended with modern life. Representations of both tradition and modernity in Japan have been closely tied to indigenous conceptualizations of *bunka* 文化, a notion that translates as culture and which emerged in the popular discourse of modern Japan during the Taisho era (1912-1926). Modern Japan is widely regarded as a society filled with customs, values, and social relationships that organically link present generations of Japanese to the past. *Group harmony, aversion to litigation, the martial arts, industrial paternalism*: these and other traditional values and practices are assumed both to predate Japan's modernization and contributed to its unparalleled success. Japan's specialists have ascribed Japan's successful modernization to the utility of its pre-modern values and institutions on the assumption 'traditions' were direct cultural legacies (Shively, 1971). Tradition in this usage represents a continuous cultural transmission in the form of discrete cultural practices of 'the past' that remains vital in the present (Vlatos, 1998). On the other hand, modernity signifies a set of related attributes that resulted from the industrial revolution and its social and economic ramifications (Buntrock, 1996). Westernization has been treated as an implicit factor in any modernization (Black, 1966). However, Buntrock (1996) argued that, modernity is a construct, which has certain attributes that are associated with western culture but that are not necessary for modernization. Japan's industrialization demonstrates this case. Because the industrial revolution was the result of technological advancement, in modernity, scientific and rational thought are valued and economic efficiencies are promoted. This emphasis on rational thought and abstraction means that conscious states are considered more important than subconscious states; "aesthetic or intuitive ways of thinking are considered peripheral to development".

It is the hope of this research to also contribute to the understanding of the implicit values in traditional product designs which seem to have been relegated, though they have immense potential that could be adopted for creating a new trend in contemporary designs. Japan serves as a good epicenter for craft-based and contemporary designs; most African cultures have yet to develop both dimensions. The exploration of the points of cross-cultural interaction is evident in the emerging economic relationship among the African and Eastern cultures<sup>28</sup>.

While the cultural interactions are thriving, the study hopes to promote new knowledge that can foster design possibilities and better understanding of global cultures through *kansei* study. Lin (2007) in his study titled Designing 'Culture' into Modern Product: A Case study of Cultural Product Design, practically illustrated the interaction between design and culture towards creating a new identity in the global market. He emphasized that cultural features are unique character to embed into a product for the enhancement of product identity (and aesthetic value) and a good point for fulfilling individual consumer's experiences. Currently, there is a drive to promote the traditional craft industry in order to strengthen their relevance as a creative sector in the modern day economy and product market. The study agrees that for design to thrive in developing economies as manifested in developed countries, adapting traditional values into modern product design will be a key approach towards reinventing local products that can draw a globally competitive demand<sup>29</sup>.

### **4.3. Integration of Background Concepts**

#### **4.3.1. Perception and Cognitive Basis of Product Aesthetic Quality**

It is believed that humans possess the capacity to perceive a wide range of qualities in products and this influences their responses within a space of interaction (Macdonald, 2000). More so, the user perspective to quality has gained significant attention in areas covering consumer research, ergonomics and *kansei* study (as can be seen in Zeithaml,

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<sup>28</sup> One of the manifestations of this growing relationship between Asia and Africa is the Tokyo International Conference of African Development (TICAD). The feature of TICAD is centered on the cooperation between Asia and Africa. Recently, there has been an emphasis on the importance of Africa's active and direct involvement in its developmental process and the partnership growth between Africa and the international community.

<sup>29</sup> From an interview based on mail opinion survey response from Professor Richie Moalosi (received on Jan 5, 2012 at 9:31 AM). Professor Moalosi is affiliated with the department of Industrial Design at the University of Botswana, Gaborone.



1988; Garvin, 1988; Aune, 1999; Bergman and Klefsjö 1994 cited in Schütte, 2005). In the study by Bergman and Klefsjö (1994), eight dimensions of product quality were given as reliability, performance, serviceability, environmental, aesthetics, faultless, safety and durability. With focus on product development, Schütte (2005) classifies two aspects of quality which are of key importance. These cover 1). ‘Affective aspects’ and 2). ‘Design aspects’. The affective aspects pertain to the emotional impact of a product while the design aspects are the physical properties of the product. In the context of integrating feelings into products, Kano et al. (1984) proposed a model as a tool for creating attractive quality in products. Of particular interest to this thesis is the user perception of products’ quality relating to an affective aspect such as product aesthetic dimension.

The value of a product cannot only be expressed by its functional dimensions but also by its ability to compel, invoke or appeal to the user. The aesthetic values of design have thus become a motivating factor driving the current trend and culture of product design and development. This often trivialized aspect of design is now getting more attention based on the understanding of the impressive impact of product image on the users’ behavior. Figure 20 below describes the level of perceptual experience with product based on increased sensorial stimulation.

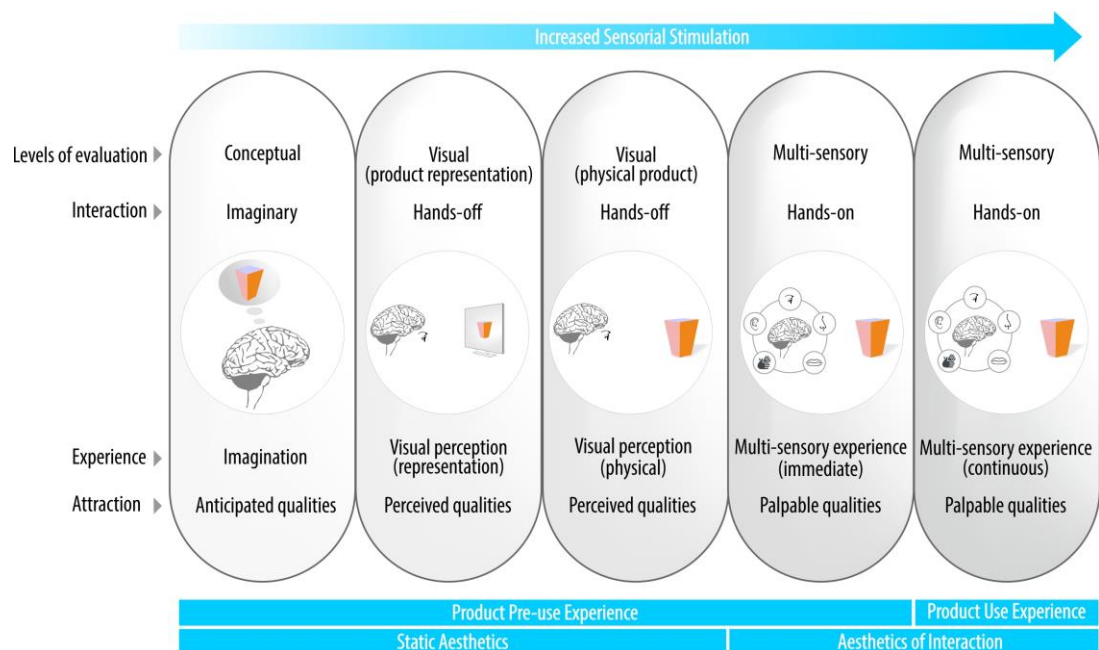


Figure 20. Levels of product perception based on increased sensorial stimulation, inspired by Khalaj & Pedgley (2014)

Essentially, perception in humans describes the process whereby sensory stimulation is translated into organized experience, whether that is on a top-down or bottom-up basis. It is a process by which organisms interpret and organize sensation to produce a meaningful experience of the world. While sensation usually refers to the immediate, relatively unprocessed result of stimulation of sensory receptors, perception, on the other hand, refers to one's ultimate experience of the world and typically involves further processing of sensory input. (Soegaard, 2006). According to the top-down theorists, perception begins from the top, focusing on expectancies, prior knowledge, and other higher-level cognitive processes and then work their way down to considering the sensory data such as perceptual stimulus. The *kansei* science provides models that support this view on perception. However, the bottom-up theorists has propounded that perception starts from the bottom and consider the perceived physical stimulus, the observable form or pattern, and work their way up to higher-level cognitive processes such as the organizing principles. James Gibson's theory of "direct perception" designates perception as bottom-up. According to Gibson's theory of direct perception, the information in our sensory receptors is enough to perceive anything. We thus perceive "directly" because we do not need any higher-level cognitive processes to mediate between our sensory experience and our perception (Sternberg, 1996). The Gestalt approach can be said to be a "bottom-up" theory as it starts from the bottom (the aspects of the stimuli that influence perception) and work its way up to higher-order cognitive processes. Gestalt psychology attempts to understand psychological phenomena by viewing them as organized and structured wholes rather than the sum of their constituent parts. The investigations in this subject crystallized into "the gestalt laws of perceptual organization which includes - law of proximity, law of similarity, law of symmetry, and law of closure.

It is said that humans possess many specific cognitive adaptations for quickly assessing attractive and repulsive properties of the physical world and that some of these adaptations are likely to be relevant to aesthetic judgments of artifacts (Ulrich, 2011). This had been in part explained through the evolutionary theory (Hekkert, 2006; Hekkert & Leder, 2008b; Ulrich, 2011). The evolutionary perspective is that in the process of human adaptation, aesthetic responses must have provided a reproductive advantage or means to survive. Thornhill (2003), having observed the debate of aestheticians over

whether beauty is “in the object, the beholder’s mind or the interrelationship of object and with mind”, puts forward: “Beauty is the moving experience associated with information processing by aesthetic judgment adaptations when they perceive information of evolutionary historical promise of high reproductive success”.

Whereas there are notions of a universal sensitivity to objects’ beauty or aesthetic cognition of design (Norman, 2004; Hekkert & Leder, 2008b; Ulrich, 2011), the range of perception and degree of responsive behavior might vary based on context, cultural formation or value system (Crilly, Moultrie, & Clarkson, 2004; Hekkert & Leder, 2008b). Eighteenth-Century philosophers such as David Hume and Immanuel Kant engaged the fundamental question of the extent to which aesthetic quality is absolute and universal or dependent on context (Gracyk, 2003; Ulrich, 2011). Some principles have been asserted in an attempt to describe a general cause underpinning aesthetic pleasure in design. For instance, the Vitruvian design principles described in (Tractinsky, 2013); and the four principles of pleasure in design presented in (Hekkert, 2006), such as: maximum effect for minimum means, unity in variety, most advanced, yet acceptable, and optimal match. To fully appreciate the role of beauty in the product development process, the notion that design is only concerned with mere styling or empty beauty was refuted through the idea of ‘aesthetics of interaction’: “Beauty, and thus beauty in interaction, is an experiential and social given. It is not just a quality of an object. It is the way an object speaks to us, calls us, affords us, puts us into contact with others, is meaningful to us; shares its inner horizon with us. Thus considered, beauty emanates from our unity with the world. It is pre-reflective” (Hummels & Overbeeke, 2010).

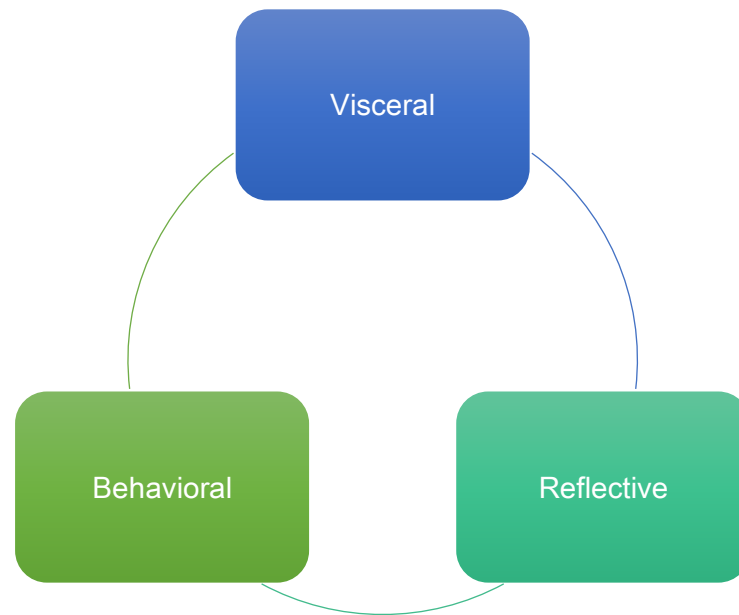


Figure 21. Norman's (2004) theory of human information processing

There is a cultural dimension to the perception of design aesthetics and hence the unparalleled response to the perception of aesthetics across culture. From the cognitivist point of view, it has been commonly established that product aesthetics positively affects usability in a significant way. Following critical observation supported by experimental case studies (Norman, 2004), it has been shown that beauty (aesthetics) promotes usability and fulfills an emotional role that product function alone cannot. Norman illustrated this using the experiments carried out by two Japanese researchers, Masaaki Kurosu and Kaori Kashimura (Kurosu & Kashimura, 1995). Following Tractinsky's (Tractinsky et al., 2000) further research using the same experiment under more methodological controls but with other cultural subject – the Israelis; not only did he replicate the Japanese findings, but the results were even stronger in Israel than in Japan, contrary to his belief that beauty and function “were not expected to correlate”. Following Norman's<sup>30</sup> (2004) proposition, product aesthetic quality may impact both visceral, behavioral and reflective levels of human information processing as illustrated in Figure 21 above.

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<sup>30</sup> The assertion that beautiful product works better has reinforced the essence of aesthetics in enhancing product usability (Norman, 2004). It's rather subtle integration into deeper layers of product experience and relevance can also be effective at communicating cognitive and implicit value which, are strong enough to be grasped by the subconscious mind.

Norman had further queried the relationship between aesthetics and how easy something is being put to use in research examining the interaction of affect, behavior, and cognition in products. His results still agree with the previous researches. His submission was that aesthetics influences the emotional state of people, which suggests why attractive things make people feel good. The model of aesthetic experience described in Figure 22 resonates with the Norman's three-dimensional theory of emotional design and the analytical/pragmatic constructs of aesthetics (Hekkert, 2006; Lavie, & Tractinsky, 2004).

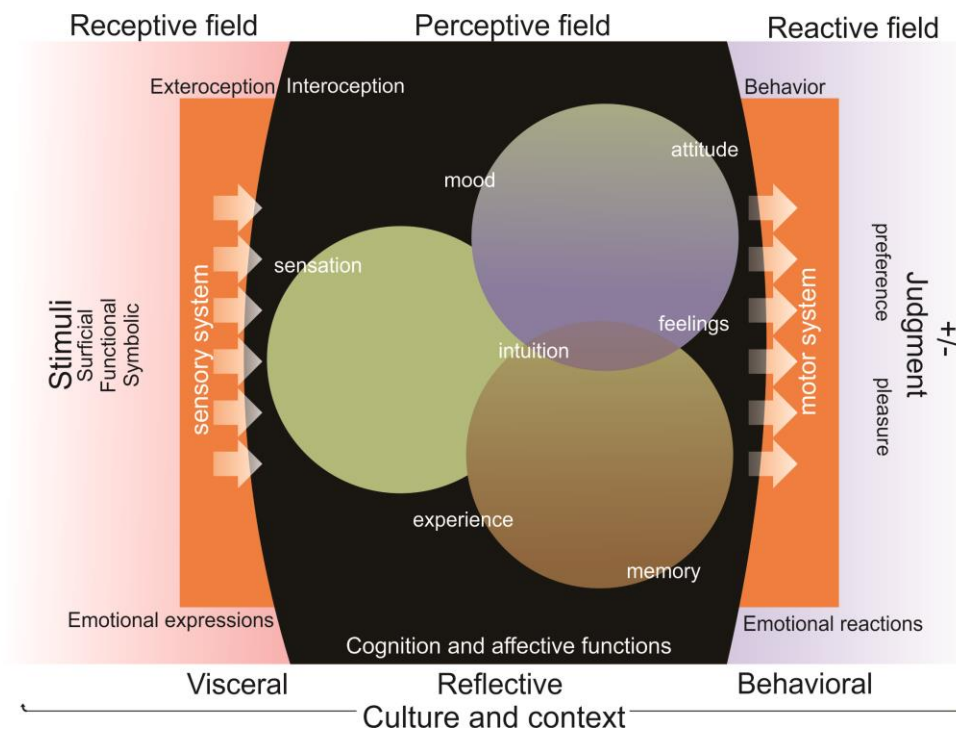


Figure 22: An illustration synthesizing aesthetic experience as a *kansei* process and Norman's three levels of information processing.

Aesthetics is one of the most important theories concerned with interactions involving human(s), artifact(s) and contexts. Significantly, the aesthetic aspects of products have been used in *kansei* studies which seek to quantify peoples' perceptions of artifacts. The perception of aesthetics in designed products could be a subjective-based process which engages *kansei* means, its process and consequent results (Lévy & Yamanaka, 2009). Cultural experience and immediate environment are considered to be among other internal factors that contribute to the *kansei* means.

#### 4.4. Aesthetics and *Kansei* Evaluation

##### 4.4.1. Cross-Cultural Approach to *Kansei* Study in Design Research

In order to promote suitable designs for global cultures, there is a need for cross-cultural understanding. Therefore, the consideration of user's aesthetics over cultural diversity

can be explored as a key factor in recognizing new gaps for designing culturally inspired products that transcend cross-cultural borders. Towards fostering creative economy in a global market, it is imperative for designers to gain a deeper understanding of users' culture and find ways to use culture as a potential resource in product development and innovation. The implication is for the design outputs to be improved to harmoniously embody both tangible and intangible qualities that result into more beneficial user - artefact relationship. While the richness of cultural values can be used as a tool to inspire design for meaningful product experience, understanding the mechanism of perception with traditional and modern products might provide a new way to promote aesthetic value in product design and a drive towards seamless integration of users' in-depth psycho-physiological needs.

Specifically, validated research tools and instruments from cultural psychology and cognitive psychology have been adapted for cross-cultural *kansei* and design related research. For examples, Lee & Harada (2000) follow an interpretive approach with existing cultural models<sup>31</sup> for a cross-cultural study between Korea and Japan, to characterize cultural effects on subjective preference. Tomico et al. (2009) proposed a subjective approach to the exploration of culture in product design based on Kelly's (1995) theory of personal constructs with a technique called Repertory Grid method. The Repertory Grid Technique is attributed by three measurement types used to determine differences in product attribute prioritization (dominance, importance and descriptive richness) in analyzing cross-cultural differences. This approach, as noted, takes individuals' perceptions of products to be carriers of implicit cultural insight, and thus, cross differences can be explored within a specific context through existing products in the market. The procedure allows for a wide kind of statistical analyses due to its hybrid qualitative-quantitative nature (Tomico et al., 2009). Park et al. (2011) in their *kansei* based cross cultural study explore factors that create cognitive diversity, focusing on image recognition processes as a method to evaluate the consumer's *kansei* (a metaphor for ease of operating product icons and buttons). The experimental tools took after the

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<sup>31</sup> Among the existing models of cultural variables, Lee & Harada (2000) selected and combined appropriate set of different dimensions resulting 7 dimensions: Relationship with Time, Relationship with Nature, Universalism or Particularism, Individualism or Collectivism, Specific or Diffuse, Affective or Neutral, and Achievement or Ascription. The dimension of Relationship with Time is subdivided again by two: Sequentialism or Synchronism, and Past, Present, and Future Oriented.

Sigel and Chiu's experimental method using categorization tasks and thus can evaluate attribute-oriented and relation-oriented tendencies among selected Asian and European cultures (Park & Yamanaka, 2010; Park, Igarashi, & Yamanaka, 2011).

*Kansei* design is globally aimed to bring *kansei* aspects in design methods and in design output. The motivation of such a target is to improve the relationship between an individual (the user) and her/his environment (whether it is the physical or the social one) through the design of new products and systems (Tomico et al., 2009). It is assumed to be true that all the foregoing *kansei* studies have helped to promote the understanding of the fundamentals of *kansei*. However, there is still need for further work on a comprehensive definition of *kansei* and developing its means of measurement.

#### **4.1.2. Affective Measurements and Cross-cultural Evaluation**

Probably one of the best ways to understand human thinking and resulting behaviors is by using a model involving mental representation structures and mental procedures that operates on this structures (Thagard, 2011). The models and structures can be studied by psychophysiological approaches. *Kansei* science in terms of domains of application and tools is often based on semantics to capture user subject is conscious feelings measured true self-administered instrument such as the SD. Likewise autonomic instruments are employed which focus on continuous emotional reactions that are not distorted by higher cognitive processes (e.g. functional magnetic resonance imaging (fMRI), electromyogram (EMG), Facial Action Coding System (FACS), skin conductance, and heart rate measurement).

Often used in *kansei* research, to evaluate products due to the practical advantages includes the SAM and the SD among others. SAM is a non-verbal pictorial assessment technique that directly measures the pleasure, arousal, and dominance associated with a persons affected reaction to a wide variety of stimuli. According to the Wundt's theoretical categories, empirical work has repeatedly confirmed that pleasure, arousal, and dominance pervade the organization of human judgments for a wide range of perceptual and symbolic stimuli (Bradley & Lang, 1994).

SD measures people's reaction to stimulus words and concepts in terms of ratings on bipolar scales defined with contrasting adjectives at each end. It is a versatile tool, which has been widely validated for the measurement of meaning, perception and attitude.

Osgood, Suci, & Tannenbaum (1967) defines the meaning of 'meaning' for which they establish this took as a psychological one or a cognitive state - that process or state in the behavior of a sign - using organisms which are assumed to be a necessary consequence of the reception of sign - stimuli and a necessary antecedent for the production of sign - responses. These measuring instruments have been validated for objectivity, reliability, validity, sensitivity, comparability, and utility (Osgood, 1952). According to Heise (1970), the applicability of SD methodology for perception, attitude and affective measurement research can be premised on the following basic attributes:

- Bipolar adjective scales are a simple, economical means for obtaining data on people's reactions. With adaptations, such scales can be used with adults or children, persons from all walks of life, and persons from any culture.
- Ratings on bipolar adjective scales tend to be correlated, and three basic dimensions of response account for most of the co-variation in ratings. For instance, the three dimensions labelled evaluation, potency and activity (EPA)<sup>32</sup>, have been verified and replicated in variety of studies. Using a few pure scales of this sort, one can obtain, with considerable economy, reliable measures of a person's overall response to something.
- SD measurements are appropriate when one is interested in affective responses. For instance the EPA system is notable for being a multivariate approach to affect measurement. It is also a generalized approach to any concept or stimulus, and thus it permits comparisons of affective reactions on widely disparate things. EPA ratings have been obtained for hundreds of word concepts, for stories and poems, for social roles and stereotypes, for colors, sounds, shapes, and for individual persons.
- The SD has been used as a measure of attitude in a wide variety of projects.

Also, in a program of research that had been set up to validate the SD in 24 different languages, the result "proves the true pan-cultural nature of the semantic space as measured"(Osgood, 1964; Jakobovits, 1966).

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<sup>32</sup> The EPA (Evaluation, Potency, Activity) structure is one of the distinctive features of the SD in reduction of ratings to three basic dimensions of variation. The structure holds up with a wide variety of subjects, concepts, and scales.



#### 4.1.3. Summary

In today's field of product design, aesthetics has served as an inspirational source for creativity and promoting the differentiation of products in the global marketplace. Numerous product design studies have concerned themselves with the subject of aesthetics and emotional factors. Moreover, the findings from on-going experimental studies on these phenomena reflect on how perception, influenced by culture, can determine the user valuations of design products and environments.

Products succeed only when they align with the user values, attitudes and behaviors, even if they result in changes to those values and behaviors (Lévy & Yamanaka, 2009). As designers become more aware of the responsibility that design must bear in the 21st century, the form and content of user-centered products or systems now demand an integration of the perceptions and wishes of the prospective users of the product (i.e., the consumers' aesthetics). Part of this expectation is the awareness of not only users' satisfaction but also an elicitation of values that promotes a sustainable consumption. This is reflected in the Japanese aesthetics. Not only are technical and objective demands important, but aesthetic, emotional, and other experiential factors are highly desired, some of which are hard or impossible to express objectively (Zeki, 1999). The task of design practice now lies in the need to balance objective and subjective properties, functional technology and emotional expressiveness, and information and inspiration.

Under this part, both concepts are discussed with various definitions in order to reach a point of convergence. As this study of *kansei* takes on a cross-cultural approach, there is new insight into the dynamic nature of aesthetic perception in product design. Culture-driven *kansei* research can provide a platform for new knowledge and ways of thinking that will help to address emerging design issues and inspire more creative steps towards product innovation (Ross & Wensveen, 2010). The onset of new issues can be a considerable factor to design for a real-world through a culturally-sensitive *kansei* design approach.

Drawing connections from the discussion of relevant theories and concepts of the study, the next chapter introduces the core objectives designed to fulfill the purpose of the study.

## **5. PRELIMINARY STUDY**

### **5.1. Case Survey on Aesthetics in African Design**

This section presents the pilot survey conducted to explore Japanese design value from an African design perspective. The research instrument used was a web-based multi-structured questionnaire targeted at African design professionals. The findings from the study were a pre-cursor to the main study conducted for this study.

#### **5.1.1. Introduction**

This preliminary study sought out for an affective component in African design that is relatable to aesthetic quality in the Japanese design context. For the purpose of the study, an online-based survey was conducted to elicit the perception of African designers about African product design aesthetics and affinity for Asian design. In this exploration, I identified aesthetics as a strong affective design value among other sociocultural factors in the African design. A reference to Moalosi's experiment (Moalosi, 2007) which investigated the sociocultural factors of some Botswana's indigenous craft products provided support for my assertions (see Figure 23). In his study, the analysis of the emotional factors indicated that "beauty" was perceived to hold an eminent value in the Botswanan design context. According to Moalosi (2007), the study subjects expressed that the products they experienced were "aesthetically pleasant" and "sensually-pleasurable". This aesthetic experience was facilitated by various distinct features of the examined products like colors, shapes, sense of what was perceived to be evoked by the reflection on traditional aesthetic (beauty) elements, like motifs, colors, shapes, and forms of the product.

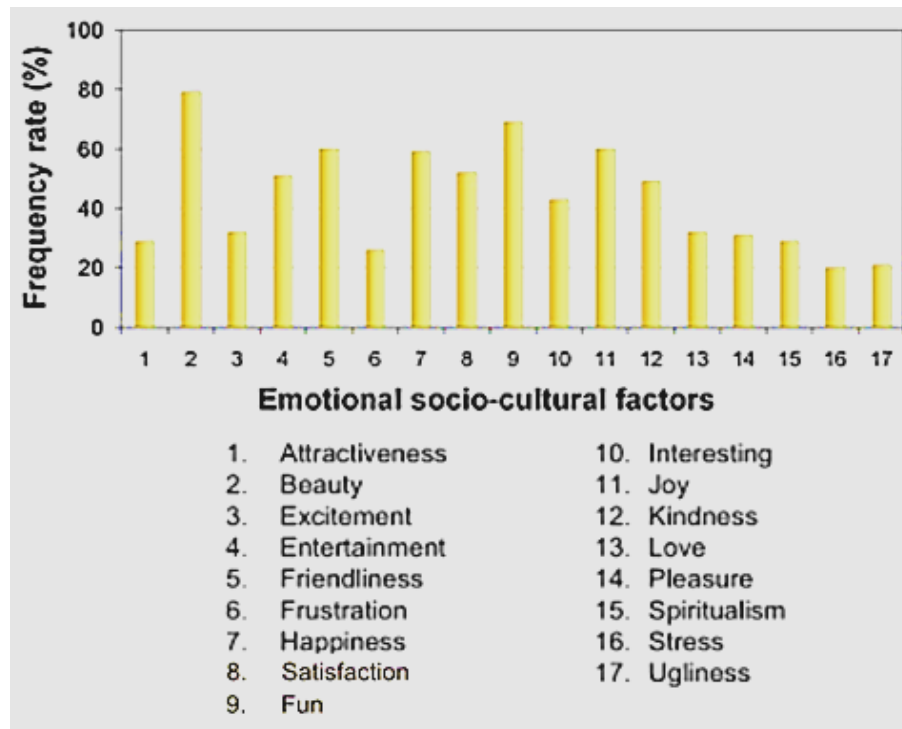


Figure 23. Emotional sociocultural factors from Moalosi's study.

The chart shows result generated from the analysis of emotional factors where beauty was highly rated in the Moalosi's evaluation study of some indigenous Botswanan products. Following the analysis, it was inferred that the emotions attached to these products is a synthesis of the impact of the physical qualities of the product, the performance of that product, the knowledge it generates, or the message it conveys (symbolic aesthetics). (Reviewed and adapted from Moalosi, 2007)

Within the purview of this study, it was inferred that the emotions attached to designed products might result from the appearance of the product (surficial), the performance of that product (functional), the knowledge it generates, or the message it conveys (symbolic).

### 5.1.2. Data Collection

An on-line platform was adopted in order to reach African designers within wide geographic areas. The questionnaire was designed with multiple-choice and Likert-scale questions using previously validated items from existing body of knowledge on African aesthetics. Twenty-four (24) African design professionals participated across Africa including members of the Network of African Designers (NAD), participated in an on-line survey. The participants cover nationalities from Nigeria, South Africa, Botswana, Uganda, Kenya and Egypt. Figure 24 below shows the area of design specialization of the respondents.

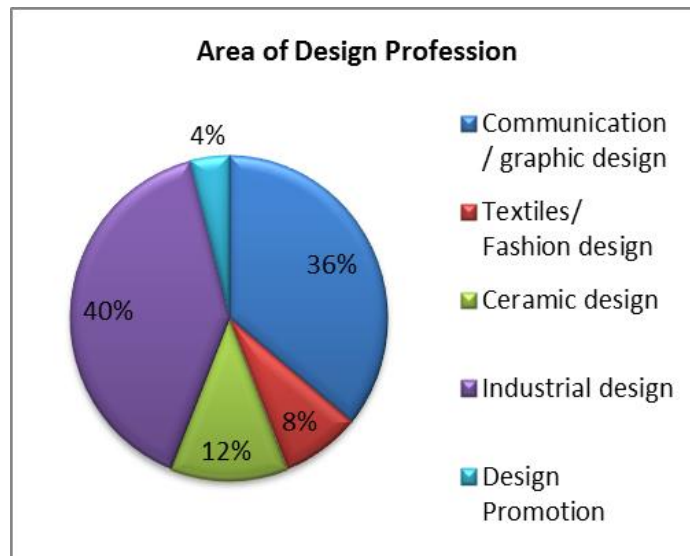


Figure 24. Professional profile of respondents

### 5.1.3. Analysis and Results

African designs were more classified as craft-oriented (Figure 25) and most designs are said to be culturally inspired (Figure 26).

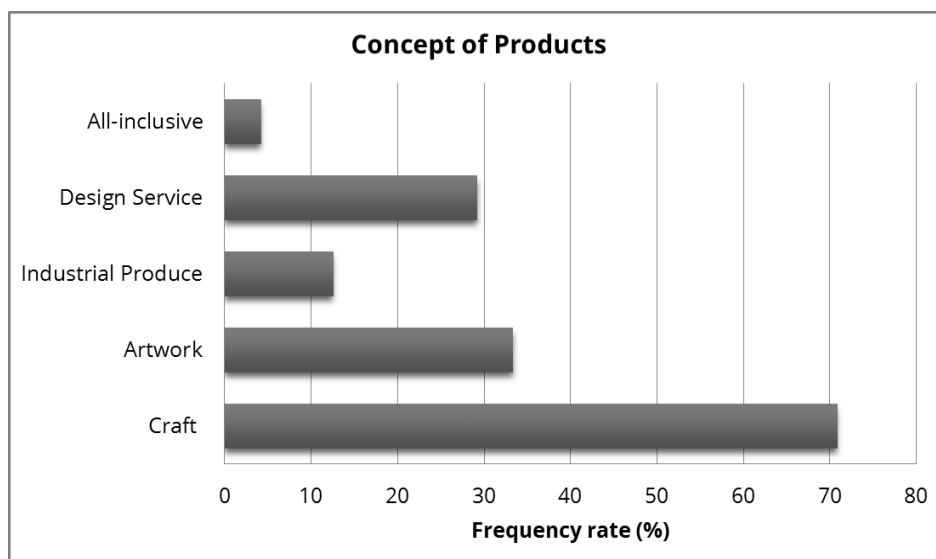


Figure 25. Designers' perception on the concept of African design products

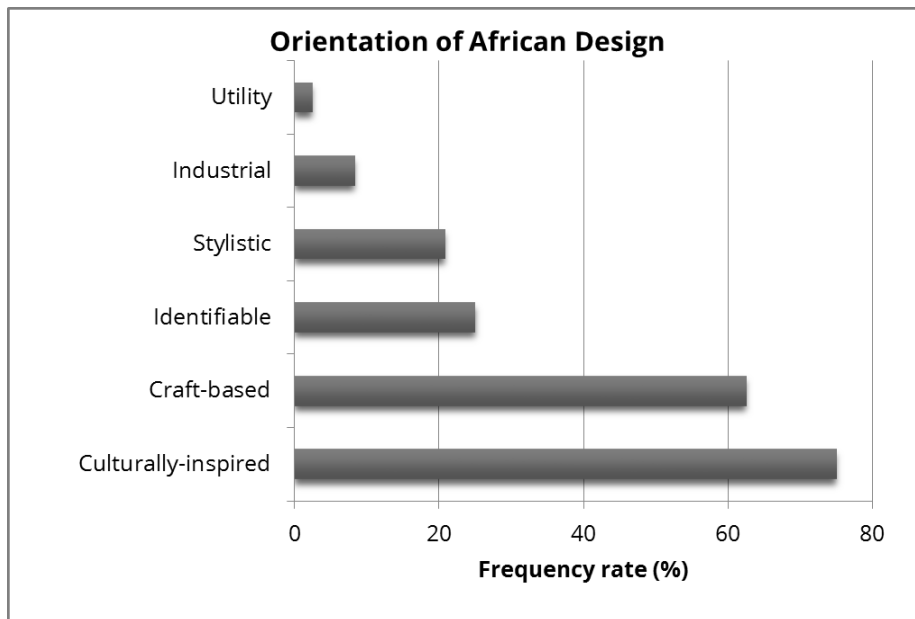


Figure 26. Designers' perception of African design attributes

The focal areas in contemporary African design as shown in Figure 27 below include cultural preservation, user-centeredness, social interaction and community development. While I could observe that there is a rich cultural dimension which is transpiring in the current trend of African design, the depth of aesthetic sensibility is yet to be ascertained. This is because of the varied responses to the role of aesthetic in the design, which seems to be more associated with the surface and symbolic representations of products (cf. Figure 28). It was also noted that African designs have not much explored the functional dimension of aesthetics, which could be attributed to product usability and beauty of human-product interaction. From the survey response, craftsmanship was the most highly rated aesthetic element in the modern sense of African product design. Table 2 shows African designers' ratings on the reflection of African aesthetic elements in its contemporary product design.

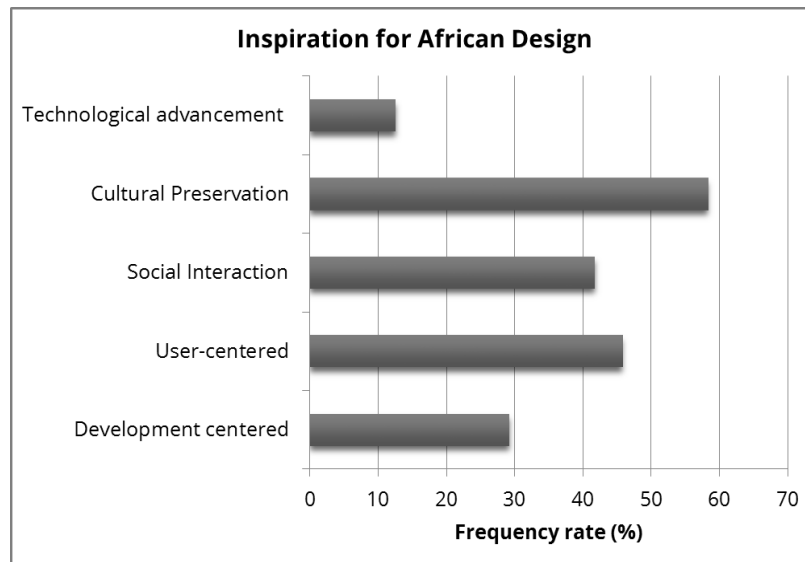


Figure 27. Main inspiration focus of African designs

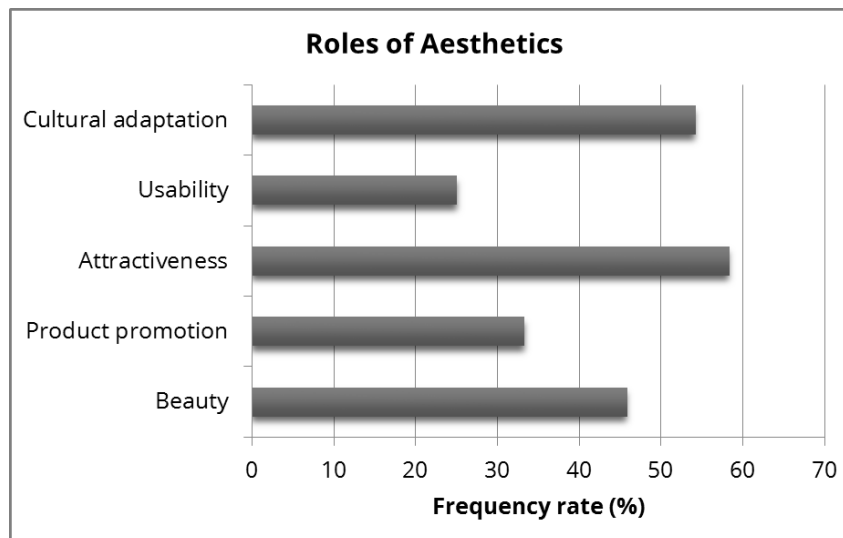


Figure 28. Perceived roles of cultural aesthetics in contemporary African designs

Table 3. Ratings on the aesthetic elements in modern African product designs

	N	Range	Min.	Max.	Mean	STD	Variance
Togetherness	24	4	1	5	3.40	1.16	1.35
Youthfulness	24	3	2	5	3.33	.92	.84
Formation	24	3	2	5	3.58	.72	.51
Surface Embellishment	24	4	1	5	3.79	.98	.96
Symbolism	24	3	2	5	3.88	1.03	1.07
Craftsmanship	24	3	2	5	4.00	.88	.78
Valid N	24						

Since Asian-designed consumer products seem well-favored in most African nations, some sociocultural factors are perceived to compel product preference besides cost advantage (cf. Figure 29). As shown in Figure 30, there is a growing awareness about *kansei* design among the African designers. This could imply a sensitization towards innovating design method and also improving design quality of African products towards the level of global recognition. More so, the knowledge of emotional values of product design and its impact on users may spur the refinement of African aesthetics in designing globally competitive products.

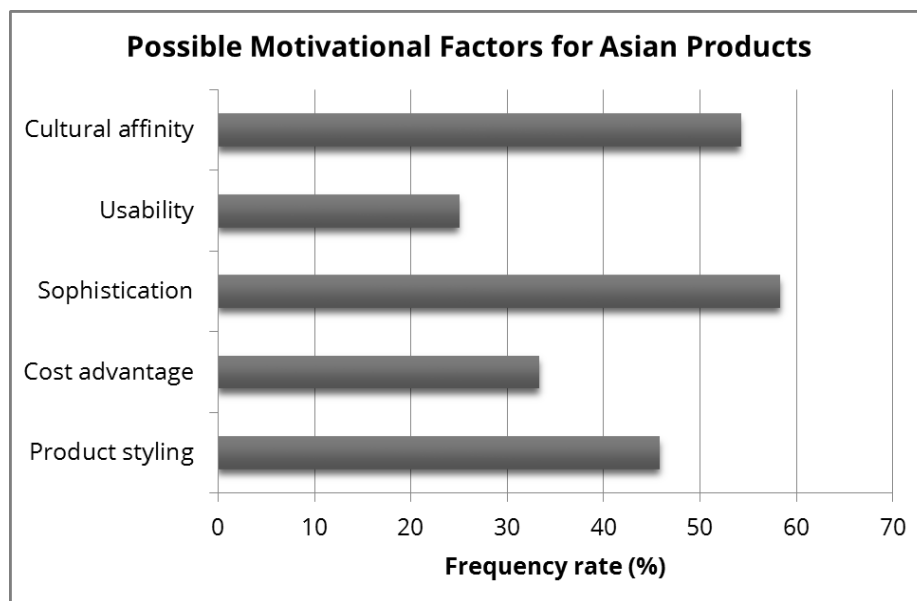


Figure 29. Ratings on social-cultural factors influencing demand for Asian products

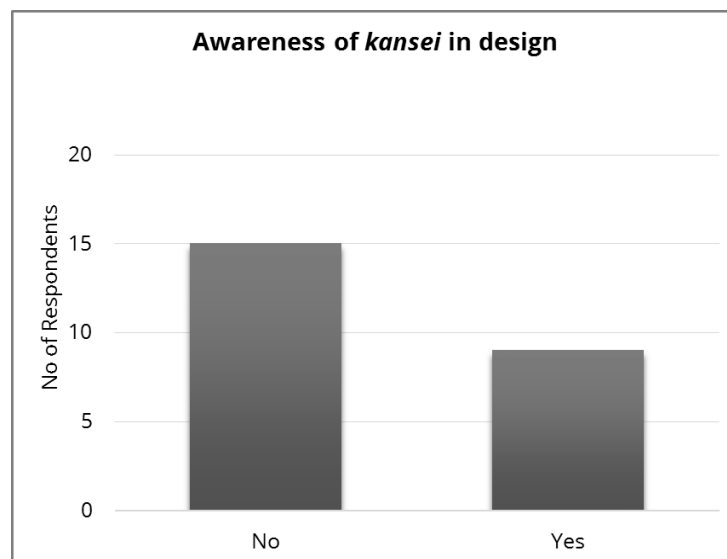


Figure 30. Awareness rate of African designers about *kansei* in design

## 5.2. Discussions

The result of this survey gave a perceptual view of the concept of aesthetics (beauty) in Africa design and hence evaluates this factor as a *kansei* related element in Japanese design context. The participants of the study included professional African designers whose responses on African aesthetics and design products indicated that African design concept is interwoven with craft, culture and beauty. The design aesthetics of Hippo water roller (shown in Figure 16), a product developed from South Africa, and Moalosi's (2007) design research in Botswana was reviewed in the study. The findings revealed the prevalent views of aesthetics in context of African design while making an attempt to investigate the element of *kansei* in the modern day African design. While there is a continue influx of Asian products in African market, the aesthetic characteristics of traditional African products which are fast disappearing within the original context. The relational attributes in modern products suggest a new way to evokes instinctive feeling and emotional connection through cultural embodiment in the modern technological based products.

Today, it is imperative for designers to be aware of the properties that connect users with product and how mind-based values can be materialized in products. A deeper understanding of implicit users' value in traditional design can be re-integrated into modern product design process. This could enhance cross-cultural product designs in which African and Asian designers can harness culture as a catalyst for designing aesthetically fulfilling products within Africa/Asia and for Africa/Asia. Product design for Africa would thrive with a synthesis of cultural identity coupled with latest technologies and collaborative approaches, hence international designers must be informed for culturally apt and geographically appropriate locally designed products to satisfy the yearning of African consumers. A designer can function at a cross-cultural point when he or she is culturally informed and can as well make "value sensitive designs" for users within a particular cultural environment. While the advanced culture, in general, adopted and continued assembly-line production, there is still a persistence of making single, once-off craft products in most African countries. This study agrees with Pido (2001) who observed that craft and piece-meal production continue to be aspects of the African cultural identity. Traditionally, African crafts have possessed artistic traits whose multivalent meanings transcend its functional and utilitarian qualities. However, it



might be reconsidered whether or not the separation of design from art and craft might undermine the relevance of African design in modern day context. Arguably, the elements of distaste in local products are seen as causative factors for people who may prefer foreign products. Hence, the lack of recognition and appreciation for indigenous products by urban consumers may suggest a need for refinement in traditional aesthetic quality in order suit the taste and lifestyle of modern societies.

### **5.3. Concluding Remarks**

Traditionally, African designs are characterized as craft-based and culturally inspired. Prominently, beauty and craftsmanship were noted as important attributes in African design. Currently, the trend of African inspired product designs contrast between modern and traditional attributes. It was opined that the East Asian product design preference is compelled by their sophistication and possibly cultural affinity between Africa and East Asia. African designers are becoming aware about *kansei* design. This indication might not be a perfect reflection but still reveals that there is a growing level of awareness on Japanese approach to design among designers in Africa.

The expanding frontier in *kansei* study and its application over cultural diversity can promote the understanding of wide range of consumers' perception of value and attitudes towards traditional and modern oriented objects. From the result of this survey, the need arose to investigate in-depth cognitive level of product design aesthetic attribute. Hence, a cognitive style test method was adopted.

### **5.4. Cognitive Style Test**

#### **5.4.1. Introduction**

Recent evidence has shown that perceptual processes are influenced by culture. In particular, a growing number of findings by cultural psychologists points to the fact that Western cultures tend to focus on salient objects, using rules and attributes in categorizing them while East Asian cultures tend to focus on relationships and similarities among objects (Chiu, 1972; Kagan, Moss, & Sigel, 1993; Nisbett, 2004; Nisbett & Miyamoto, 2005) (cf. Figure 31). With an exploratory approach, this study attempted to examine whether differences of cognitive style exist among African and East Asian cultures, in order to identify possible implications for cultural divergences for

aesthetic value cognition in product designs. While there is currently a growing products market among East Asian and African countries as indicated by UNCTAD Trade and Development Report (UNCTAD, 2014b), the affinity towards cross-cultural product designs may not only be anchored on the basis of product affordability or sophistication. Meanwhile, gravitation towards aesthetic values in a product design is assumed to be a contributing factor. Hence, this study considered that the cultural styles of cognition could serve as a basis towards understanding the process of eliciting meaning in product designs among the African and East Asian cultures. Especially for this study, it is of imperative consideration to understand the cultural inclination in the pattern of cognition between African and East Asian people (with the case of the Japanese). The study hypothesized that there is a significant difference in the cognitive style between African and Japanese. In effect, this might explain the characteristics of perceptual style of aesthetics in designed objects.

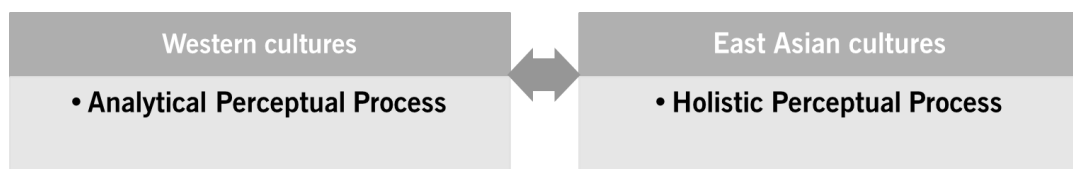


Figure 31. Prevailing evidence from previous studies

This test was developed based on this principal method used by developmental psychologist Chiu, L. H. in testing for the recognition process of relation. According to Chiu's experiment (Chiu, 1972), American and Chinese children were presented triplets of pictures (e.g., cow, chicken, and grass) and asked which two belonged together. His result, which was further strengthened in subsequent studies showed that American (Western) children tended to group based on categorical associations (cow goes with chicken because they are both animals) while Chinese (Asian) children tended to group based on relationship (the cow eats the grass). Ji and colleagues showed the same phenomenon with subjects using words instead of pictures (Ji, Zhang, & Nisbett, 2004). In this study test, only words were used to represent the stimuli instead of pictures.

#### 5.4.2. Procedure

An online test was set-up where Japanese (n=35) and Africans (n=37) participated, comprising mostly university students. Out of the 37 Africans that responded, two responses were incomplete and thus, there were 35 valid responses from the African

participants ( $M_{age}=30$ ; 57% male) and 35 ( $M_{age}=24$ ; 60% male) from the Japanese participants. The Japanese represented Asian while no restriction was placed on nationalities of African participants (Table 4). For the participants, there were variations in age and professional background. The question was offered as follows: *From question..., please select from the given options which you think is CLOSEST to the \*TARGET object and probably stating your reason.* The questions for the African were set in English while Japanese language was used for the Japanese. Artificial objects and natural objects were selected as the stimuli and represented in words (Table 5).

Table 4. Participant's profiles

	East-Asian	Africa
<b>Nationality</b>	Japanese	Nigerian (14), Tunisian (9), Ghanaian (3), Ugandan (3), Kenyan (2), Malawian (2), Beninese (1), Eritrean (1)
<b>No. of valid responses</b>	35	35
	21 Male; 14 Female	20 Male; 15 Female
<b>Total</b>	70	

Table 5. Examples of selected objects as word stimuli for the online test

Target objects	Option A	Option B
Paper	Tree	Pen
Mug	Wine glass	Clay
Cow	Hen	Grass
Ice	Water	Freezer

#### 5.4.3. Assumptions

Following previous studies by cognitive psychologists (Chiu, 1972; Kagan, Moss, & Sigel, 1993; Nisbett & Miyamoto, 2005), it was predicted that the Japanese who represent the 'East Asians' would have a natural tendency of relationship-based or extrinsically-oriented categorization than the participants who represent 'Africans'. On the other hand, it was taken that the African participants (considered to have come from Western-influenced societies) may tend to categorize objects by identifying similar

attributes or in an intrinsically-oriented manner. Although there are cultural variations across African countries, however, this experiment stood on the basic commonality of diverse cultures in Africa such as their shared heritage of aesthetic tradition and prevailing world view.

#### 5.4.4. Analysis and Result

In order to verify the hypothesis, the cultural inclination in the process of perception according to participant's characteristics was analyzed based on the main regions- Africa and Japan. This experiment is about the comparison of the cognitive distance between African and Japanese in relation to the basic mechanism of thought process – categorization and inferential thoughts. As described in Table 6, the answer to the question is either choice A (word related to attribute) or B (word related to relationship).

Table 6. Prediction for object categorization in test condition

Perceptual style	Analytic/ Attribute-oriented	Holistic/ Relationship-oriented
<b>Point of focus</b>	Intrinsic or shared properties (Taxonomic classification)	Externally related property or relationship in the context of use (Thematic classification)
<b>Lists of predicted word combination</b>	Paper + Tree Mug + Clay Cow + Hen Ice + Water	Paper + Pen Mug + Wine glass Cow + Grass Ice + Freezer

In order to confirm the difference of recognition pattern by regional cultures, the tendencies of choice according to the questions was compared. The analysis of the responses was done based on comparison between the two regional cultures. The charts under Figure 32 descriptively show the distribution of responses from the African and Japanese participants over a range of four questions. According to the response question a, 71% of the African participants assigned tree with paper whereas 29% assigned pen with paper. From the Japanese perspective, 40% of the participants combined tree with paper while 60% combined pen with paper. The choice-ratio in response to question b shows that 23% of the African participants categorized wine glass with mug while 77% categorized clay with mug. In the case of Japanese, 51% of the participants categorized wine glass with mug while 49% categorized clay with mug. In response to question c,

6% of African participants chose to combine hen with cow while 94% of them combined grass with cow. Whereas, 31% of the Japanese participants combined hen with cow and 68% combined grass with cow. Lastly, the response to question d shows that 69% of African participants combined water with ice while 31% of them combined freezer with ice. On the side of the Japanese, 60% of the participants categorized water with ice and 40% assigned freezer with water. In reference to the summary of responses for the categorization task, Figure 32a reveals a widest variation in the choices of the African and Japanese participants based on question c, followed by question a, b and d respectively. A tendency analysis was done by Chi-square ( $\chi^2$ ) test, which verifies the difference of choice-ratio between options A or B. The significance level was tested with  $p$  value= 0.05 (cf. Table 7).

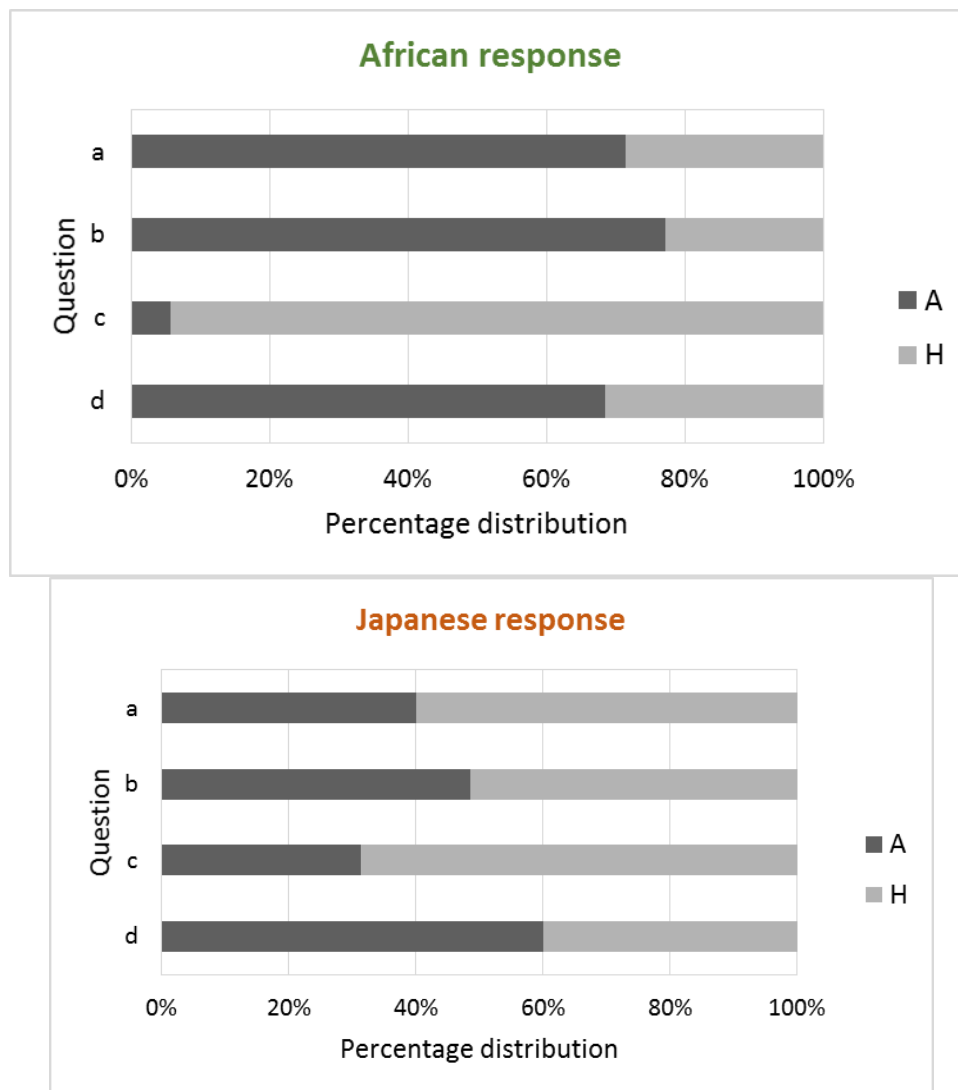


Figure 32. Classification tendencies by region.  
(Key: A= Analytic, H= Holistic)

Table 7. A comparative analysis of classification tendency by region

Question	Target	Selection ratio – Analytic vs Holistic			Pearson Chi-square ( $\chi^2$ ) test	
		Africa	Japan	Average	Chi Square Value	Asymp. Significance (2-sided)
<b>a</b>	Paper	25	14	19.5	7.006	.008
<b>b</b>	Mug	8	18	13	6.119	0.13
<b>c</b>	Cow	33	24	28.5	7.652	.006
<b>d</b>	Ice	24	21	22.5	.560	.454

Following the pattern of responses obtained with four questions, the result indicates that there was a significant difference in the choice-ratio of questions a and c. Overall, it can be deduced that the perceptual style of the African respondents was more inclined to categorize objects based on analytic and attribute-oriented cognitive style. However, in reference to their response to question c, it is uncertain if this tendency among Africans is consistently true for all the nationalities that participated in the task.

### 5.5. Discussions

Through responses to an online test, the difference of thought process based on a cognitivist approach was considered. In a categorization task using familiar objects presented in words, the study examined differences in cognitive process between Africans and Japanese, as a basis to explain divergences in the perception aesthetic value of objects. Based on the test result, the African participants were more likely to respond with analytic and attribute-oriented thoughts than the Japanese counterparts. Although a distinctive difference was not obtained due to inconsistency in responses from questions a and b. However, considering questions b and d, where the responses seemed to show no significant difference, the Africans were still considered a bit more intrinsically-inclined<sup>33</sup> in thought than the Japanese according to the described data (in Figure 32). By examining the added comments made by the respondents, the African point of reasoning were anchored on the attribute of origin and source in connecting objects together.

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<sup>33</sup> i.e. focusing on the intrinsic properties or shared attributes of classified objects rather than the externally related properties or relationship in the context of use.

Examples of prevailing statements are ‘paper is made from tree’, ‘clay is the raw material (for mug)’, ‘you don’t necessarily need a freezer to make an ice but you need water’, and so on. Whereas compared to the African participants, the Japanese point of reasoning tends to establish the relationship between objects in the context of use. Nevertheless, there was not enough evidence to establish this test assumption especially when regarding the discrepancy shown by the participants’ responses to questions a and c

Despite having an unconvincing evidence to reinforce whether Africans’ systems of thought is more inclined to the Western or East Asian culture, a trait of evidence can be drawn to support that there is a cognitive gap between African and the Japanese cultures. In view of this tentative result, the diversity of the respondents’ age group, social class and nationality can be considered as interfering factors, and thus suggesting a more focused study. Therefore, in order to make several interrelated predictions can be made concerning cognitive differences between African and Asian in the perceptual experience of objects, the rule might also hold that social factors influence cognitive processes. Also, considering these other factors might allow for a more comprehensive explanation on the variation that might exist across the cultural groups. For instance, in the study by Knight and Nisbett (2007), the behavioral difference by social class was shown to influence on the formation of cognitive styles even within similar cultural groups. In this regard, the study can suppose that social class, specific social background and educational training of participants may be among the influential factors creating cognitive difference in perception.

## **5.6. Concluding Remarks**

Among scholars studying human thought, there are those who focus on the characteristics of human perception. In addition, scholars in the humanities and social sciences claim that members of different cultures differ in their “metaphysical thought,” or fundamental beliefs about the nature of the world. Based on these opinions, people from different cultural backgrounds should have diverse cultural inclinations towards understanding object’s properties. Nisbett and his colleagues (Norenzayan & Nisbett, 2000; Nisbett, 2004; Nisbett & Miyamoto, 2005; Miyamoto, 2013) have argued that “these differential perceptual and cognitive tendencies are rooted in the different social practices of the two regions. East Asians are more dependent on each other in many

respects, and their attention is focused on the social world and hence the field as whole”. On the other hand, “Westerners are more likely to attend to, perceive and remember the attributes of salient objects and their category memberships”. Africa, due to its closeness to the western countries and the lingering influence of colonialism, could be assumed to share similar cognitive traits with the Westerners. While a similar tendency might exist, this speculation remains as an assumption until it is proved. Besides, Africa is attributed with a social system and traditional cultural values which are at some variance with the Western culture.

In a previous *kansei* study by Park & Yamanaka (2011), which focused on the differences of *attribute-* and *relationship-oriented thoughts* among selected Asian and European nationalities, the inclusion of ‘recognition processes’ was established. This was supported by the fact that recognition processes have been studied in the field of humanities, social sciences, cognition science, and psychology as well as marketing, education, and interface design which need knowledge of specific groups’ ways of thinking.

In a preliminary investigation, this study explores cognitively, the difference of perceptual style between African and East Asian cultures. Following a cognitivist approach adopted in Park’s (2011) and Ji’s (2004) studies, the study conducted a web-based cognitive style test by adopting triads of objects (in textual form) in a free categorization task. In the main study for cognitive style test, the study sought to explore cognitive style of categorizing visually illustrated objects with participants from Japan and South western Nigeria. The study findings based on the preliminary study shows that the African participants could be more inclined towards an analytic and attribute-oriented thought as compared to the Japanese participants. Nevertheless, a reflection of inconsistent response also indicates that a diverse pattern of cognitive style might exist among the African cultures. In a focused study, the study revealed a similar tendency of cognitive style based on the number of participants and experimental condition of the study with Japanese and Nigerian students.

Understanding user’s cognitive process in perception of aesthetic value in products would be a key factor in recognizing new gaps in the design process. Hence, the design outputs can be improved to embody qualitative meaning and distinct aesthetic values,



which emotionally and instinctively connect with the users. In order to investigate on perceptual process based on cross-cultural product evaluation test adopted towards selected objects. Following this study to understand the prevailing cognitive style difference between among Africans and Japanese, a model for cross-evaluation of cultural products using semantic and affective measuring tools was proposed. Particularly, this cross-cultural product evaluation model intended to further explore the points of convergence and divergence of aesthetic value towards African and Japanese product designs, a cross-cultural evaluation based on *kansei* method was proposed.

## 6. MAIN STUDY

### 6.1. Product Evaluation Test I

This chapter reports on the main test involving product evaluation. This test was conducted to investigate the difference of product evaluation between East Asians and Africans with regards to aesthetic perception, familiarity and preference. The product sample adopted were pre-selected objects with African creative origin. The section describes the procedure of test, stimuli selection, presentation of data and analysis of evaluation response gathered from African and Japanese participants.

### 6.2. Introduction

This pilot study focuses on the investigation of cultural effect involved in the process of perceiving aesthetic qualities and assigning value to designed objects bearing African origin, to understand users' aesthetics over cultural diversity. It involved limited population sample of African and Japanese participants for the evaluation of a selected range of African-inspired product samples. Figure 33 illustrates the model proposed for cross-cultural product design evaluation.

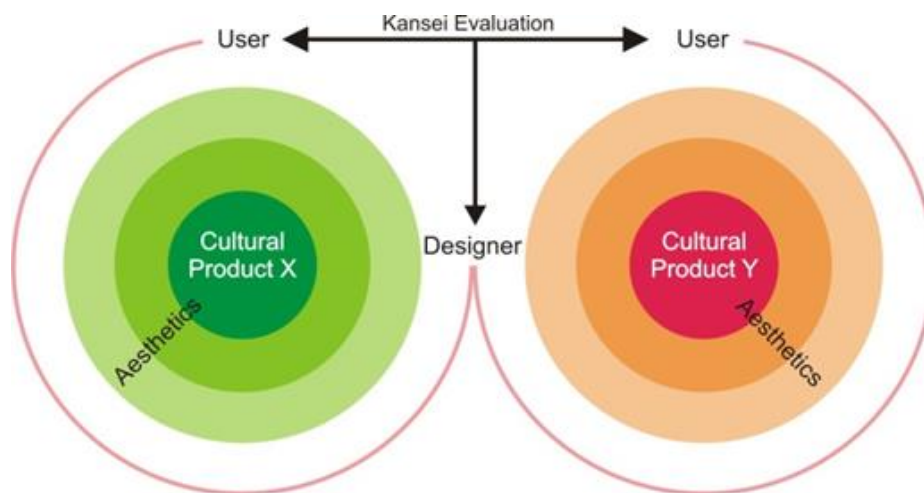


Figure 33. A proposed model for cross-cultural product design evaluation.

Exploring a cultural dimension to the perception of aesthetics in cultural products based on *kansei* evaluation is adopted as an approach for designers to better understand users' values.

#### 6.2.1. Stimuli Development

Visual stimuli of fifteen African designed objects were purposively pre-selected from a publication of South African Bureau of Standards (SABS) award-winning products and reliable internet sources. These items were sorted and visually characterized into three

main categories – *traditional*, *semi-modern* and *modern*, based on the level in typicality of tangible cultural qualities and design elements such as can be physically observed in the product form, surface treatments, material and level of technological sophistication (as shown in Figure 34).

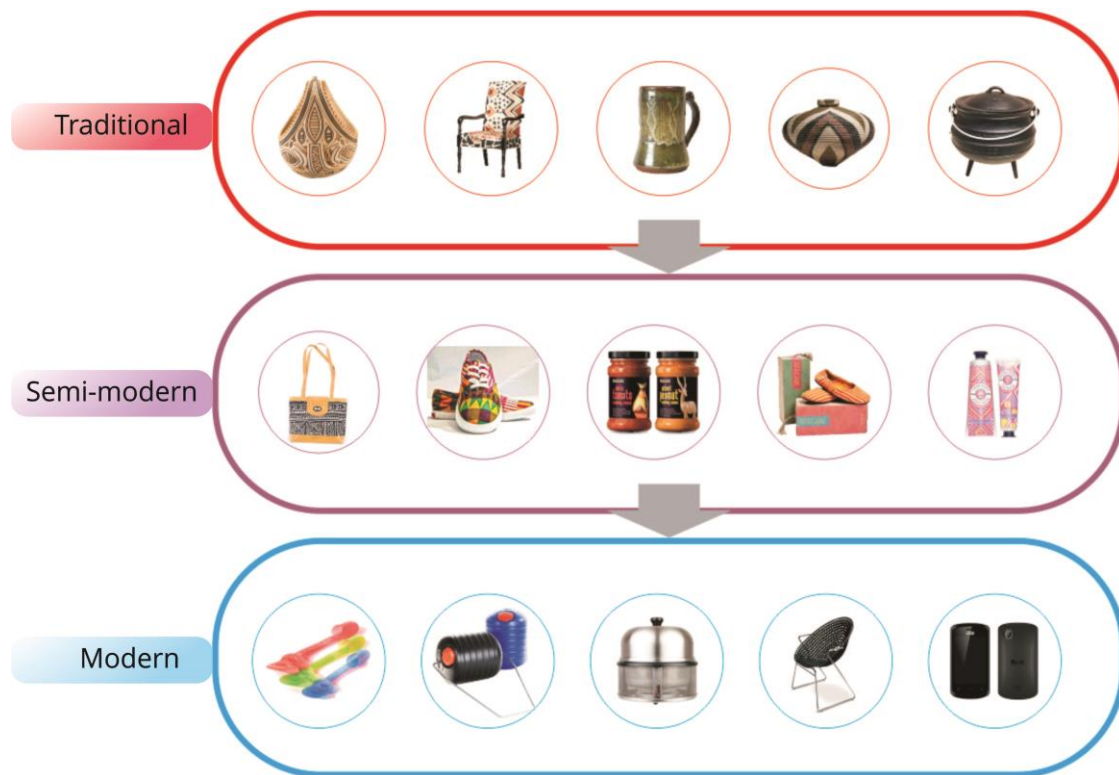


Figure 34. Images of selected product samples sorted into 3 categories namely *traditional*, *semi-modern* and *modern*

### 6.2.2. Selection of Bipolar Evaluation Words/Phrases

Adjectives, nouns, technical terms, and jargon are reportedly used in *kansei* research, for SD evaluation and these words are referred to as *kansei* words (Nagamachi, 2011). To investigate the difference of culture on perception through visio-semantics evaluation of African designed objects, the selection of *kansei* words was intended to reflect on product-centered and user-affective values. It is often the case that researchers decide which bipolar pairs can be suitable for their study based on the underlying phenomena they are aiming to investigate (Khalaj & Pedgley, 2014). Likewise, in this preliminary study, selection of bipolar pairs was derived based on the aesthetic perception model earlier proposed by the study. It was an attempt to describe users' emotional, cognitive and information processing mechanisms towards objects, drawing a parallel with

Norman's and Lin's theories. These aesthetic expressions in product design are defined as:

1. Surficial aesthetics: for perceived physical qualities
2. Functional aesthetics: for perceived interactive qualities
3. Symbolic aesthetics: perceived associational qualities

In addition, there are two exploratory factors considered for investigation in this study. These include:

4. Trendiness: perception of how traditional or modern a product appears
5. Familiarity: perceived acquaintance with product

The use of conceptual grouping was a strategic step. The headings served as priori prescriptive groups and guiding concepts from which bipolar pairs were derived for user's evaluation. Since it is possible that individual adjectives or phrases might have multiple interpretations, restricting them to a particular thematic framework make their construal easily focused. For example, 'cute – not cute' was ascribed to *Surficial* group to indicate an interpretation based on the perceived visual quality of a product sample if this evaluation word pair was not thematically framed in this case, participants may as well construe its meaning in a behavioral sense of cute mannerism, thus making their response less reliable. The evaluation pairs adopted here were founded on previous studies related to object aesthetics, design evaluation and *kansei* studies (e.g. Jacobsen et al., 2004; Ohkura et al., 2005, 2011; Hsiao & Chen, 2006; Blijlevens et al., 2009; Tomico et al., 2009; Park and Yamanaka, 2011; Creusen & Schoormans, 2005; Ellis, 1993; Sanabria, 2011; Kim et al. 2012; Han & Qualls, 1985; Bilkey & Nec, 1982). The aim was to adopt representative words or phrases under prescriptive groups while acknowledging that are endless lists of words or phrases that could also have been chosen. For the compiled lists presented in Table 8 below, it was ensured that they show high relevance to each group and that they are not semantically overlapping pairs across the groups. As the study involved different cultures from Africa and East Asia, the evaluation form was prepared in English, Japanese and Korean. The English-Japanese and English-Korean translations were assisted by two colleagues with bilingual skills and further checked by Japanese and Korean educators.

Table 8: Set of 12 grouped bipolar adjective/phrase pairs

	Priori prescriptive groups	Bi-polar pairs	Connotational meaning	Premise for selected evaluation word	Reference to previous studies
1.	<b>Surficial</b>  Perceived physical qualities	Beautiful- Not beautiful	A combination of qualities, such as shape, color or form that pleases the aesthetic senses, esp., the sight. In other words, objects' physical properties that attracts and appeals to senses.	The adjective word 'beautiful' has been found to be an essential concept for describing the aesthetics of objects. Translated in this study as <i>utsukushi</i> in Japanese, this evaluation word is emotive and can come naturally to individuals when performing visual aesthetic judgment.	Jacobsen et al. (2004); Nagashima et al. (2012)
		Cute - Not cute	Object's attractiveness by means of smallness or prettiness	Nowadays, cute ( <i>kawaii</i> ) becomes a significant value in the modern trend of design. This is not only limited to Japan but also seems to be an attribute that can be naturally recognized and appreciated by humans.	Ohkura et al. (2005, 2011); Hsiao & Chen (2006)
2.	<b>Functional</b>  Perceived interactive qualities	Fun-to-use - Not fun-to-use	Object's affordance for amusement in the process of use	Previous product semantic researches have shown that user can perceive playfulness in product appearance. The 'fun element' in the product has been revealed as a stimulating value in perceived product quality.	Blijlevens et al. 2009; Tomico et al. 2009
		Dynamic - Static	Object's activeness and efficiency in the process of use	The degree of 'activeness' of a product or product parts can form an image of differentiating levels of movement and engagement for product interaction.	Hsiao & Chen (2006); Hisao & Chen (1997)
		Intuitive - Not intuitive	Object's affordance for instinctive knowing in the process of use	Understanding the ability of instinctive knowing is considerably important towards enhancing the ease of product use and a harmonious human-product interaction. Park's study (2011) has suggested that users' individual <i>kansei</i> may be understood by their process of understanding object's properties.	Park and Yamanaka (2011)
3.	<b>Symbolic</b>  Perceived worth/	Valuable - Not Valuable	A mental image of object's worth to be sought for or <u>desired</u>	The question of 'how' and 'why' individuals choose an object has become an important theme in understanding user's motivation in product evaluation. The sense of worth and desirability of an object culminate in	Scherer (2005); Kim et al. (2012)
		Befitting - Not	A mental image of how suitable an object is		

	preference	befitting	compared to one's social status or self-esteem	preference – an evaluative judgment in the sense of liking or disliking an object. Kim's (2012) study highlighted that though preference has been considered as an important theme in design, preference mechanism has not well been accounted for. To explore further on this theme, three evaluation words – valuable, befitting and desirable – were adopted in pairs for this test.	
		Desirable - Undesirable	A mental image of goodness or worthiness to have an object		
4.	<b>Trendiness</b>	Modern - Traditional	Modern means characteristic of present-day design	Modernity has been described as an essential product appearance attributes which contribute to product appraisal	Blijlevens et al. 2009; Creusen & Schoormans (2005); Ellis, 1993
	Perceived past and futuristic qualities	Innovative - Not Innovative	Being or producing something like nothing done or experienced or created before	In the modern trend of design, product innovation has been adopted as an important factor for user evaluation. In particular, this quality concerns the increase in complexity and systemization of product functions.	Hsiao & Chen (2006)  Fort-Rioche & Ackermann (2013)
5.	<b>Familiarity</b>	Extremely Familiar - Not familiar at	Well known or easily recognized	Previous study has suggested a clear relationship between user's previous experience and positive attitudes induced by feeling of familiarity. Based on the theoretical account by Zajonc (1980) and familiar things tend to generate favorable affective responses. In addition, evidence from Sanabria (2011) showed a positive correlation between familiarity and pleasure in visual evaluation of familiar ad images and words combinations. Therefore, familiarity and congruity are considered to be contributing factors in testing user's implicit knowledge. In order words, the sense of familiarity is deeply related to users' individual <i>kansei</i> , combining cognition and emotions.	Sanabria (2011)
	Perceived distance (Cognitive distance)	Extremely looks indigenous - Doesn't look indigenous at all	Characteristic of or relating to one's design tradition and style	As shown by several consumer researches, the place-of-origin effect and their impact on users' product perception and evaluation cannot be underestimated. Particular for cross-cultural studies, this effect may contribute towards understanding the underlying factors for users' preference towards product.	Han & Qualls (1985); Bilkey & Nec (1982)

### 6.2.3. Participants

In this study, 20 African participants (male=16, female=4) and 20 East Asian participants (male=17, female=3) who were non-design students at the University of Tsukuba between the age of 18 and 35 voluntarily participated in a product evaluation task for an average time of 30mins per subject. The African s participants include nationalities of Ghana (1), Kenya (2), Tunisia (2), Mozambique (1), Ivory Coast (1), Malawi (2), Angola (1), Senegal (1), Benin (1), Zimbabwe (1), Ethiopia (1), Eritrea (1), Nigeria (4), and Guinea (1). The East Asian participants were represented mainly Japanese (16) and Korean (4).

### 6.2.4. Procedure

The experimental test made use of a paper-and-pencil version of SD method proposed by (Osgood et al., 1967) to investigate participants' aesthetic perceptions through the objects' visual appearances. Alongside this, the SAM scale developed by (Bradley & Lang, 1994) adopted to measure the progression of affective experience in the course of evaluating the three product categories. SD and SAM have been used effectively in *Kansei* research to measure perceptive and emotional responses in a variety of situations, including reactions to visual stimuli (Lee & S.H.Lee, 2007; Carlos & Zepeda, 2012; Kim, Cho, Niki, & Yamanaka, 2012).

In the test questionnaire, the SD evaluation scale consists of selected opposite adjective pairs (*modern – traditional, beautiful – not beautiful, cute – not cute, fun-to-use – not fun-to-use, dynamic – static, innovative – not innovative, intuitive – not intuitive, valuable – not valuable, befitting – not befitting, and desirable – undesirable*), listed on opposite ends of a bipolar 7-point scale. Appended to this lists are two 7-point Likert scales (1= *Extremely*, 7= *Not at all*), which includes evaluation rating for object familiarity and indigeneity (for recognition of product origin).

The SAM, which is a pictorial assessment scale, basically has 9-point rating scales for the affective dimensions of valence, arousal and dominance with 3 bi-polar words (happy – unhappy, calm – excited, dependent – independent). In order to show the differentials in change of emotional feeling in the progression of item evaluation, the SAM scale was presented to the participants at a fixed interval from the start of their

assessment and after the semantic evaluation of each of the item category. Finally, the participants are asked to freely respond to a 3 sets of an open-ended question. Figure 35 illustrates the overall process of the test procedures.

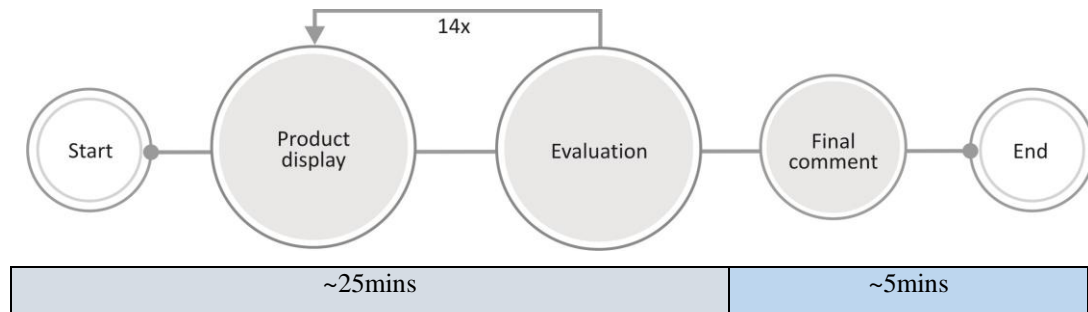


Figure 35. Procedure of test

### 6.3. Analysis and Results

Various analyses were carried out on the data collected from the above test to derive results in order to draw inferences from the test. These results will be described and discussed under the following sections based on the analytical methods used. A combination of Microsoft Excel and SPSS software were used to classify the dataset and carry out all the data analyses.

#### 6.3.1. Univariate Analysis

Valid responses were obtained from 40 participants (20 Africans, 20 East Asians). First, to confirm product samples sharing a common visual attribute based on trendiness (i.e. using the participants' response of ratings for *modern – traditional*); a hierarchical cluster analysis was applied. Moreover, since the selected product samples were pre-categorized into three levels, viz. *traditional*, *semi-modern* and *modern*, there was a need to also confirm the perceptual matching for the initial categorization done by the researcher and that of the test participants. As can be seen in Figure 36, the results show three distinct clusters of the product samples based on responses from African and East Asian participants. To clarify these results, an expanded view of the cluster analysis is presented in Figure 37.



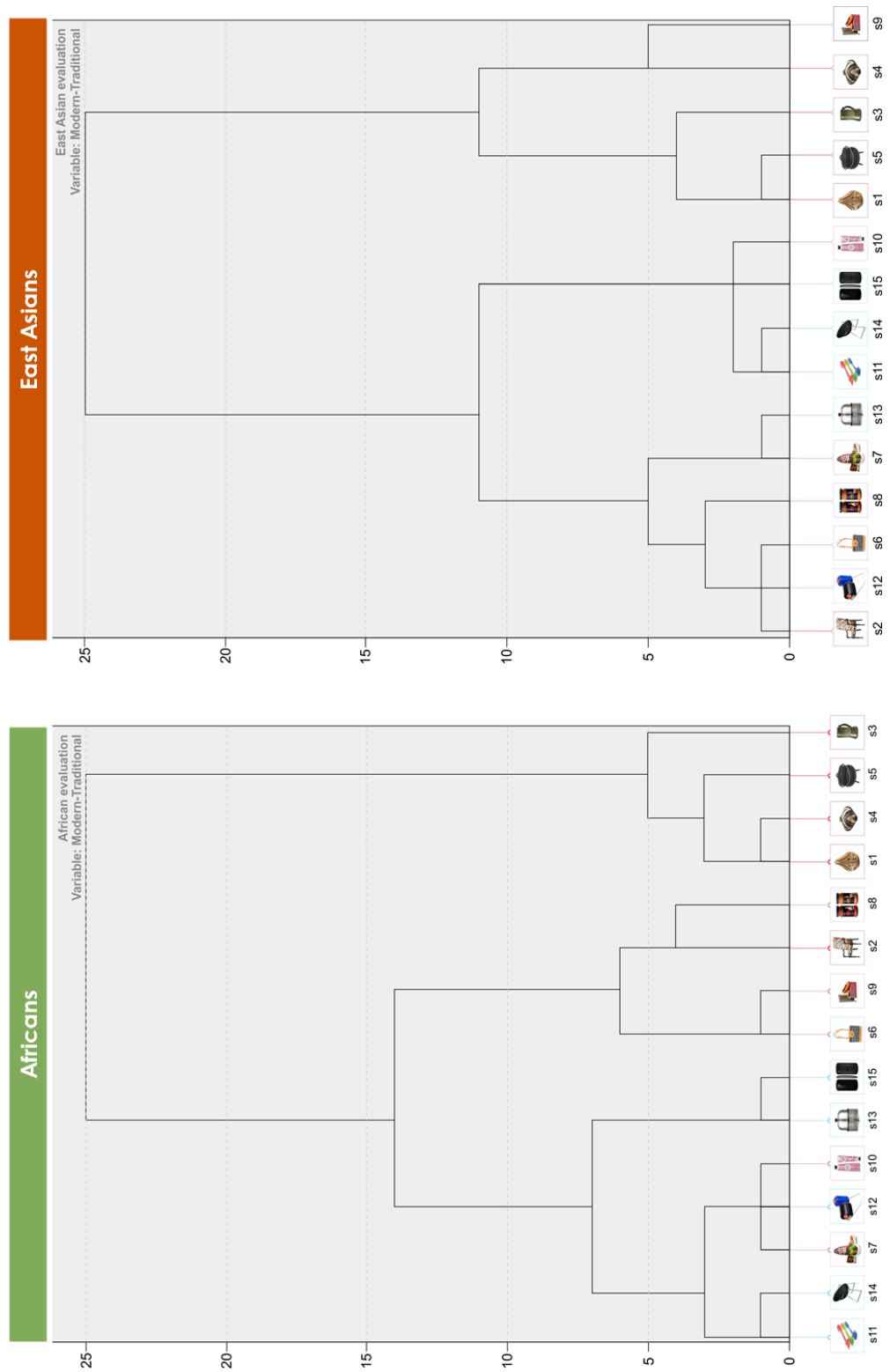


Figure 36. Hierarchical Cluster analysis using trendiness as a univariate (Dendrogram using Ward method)

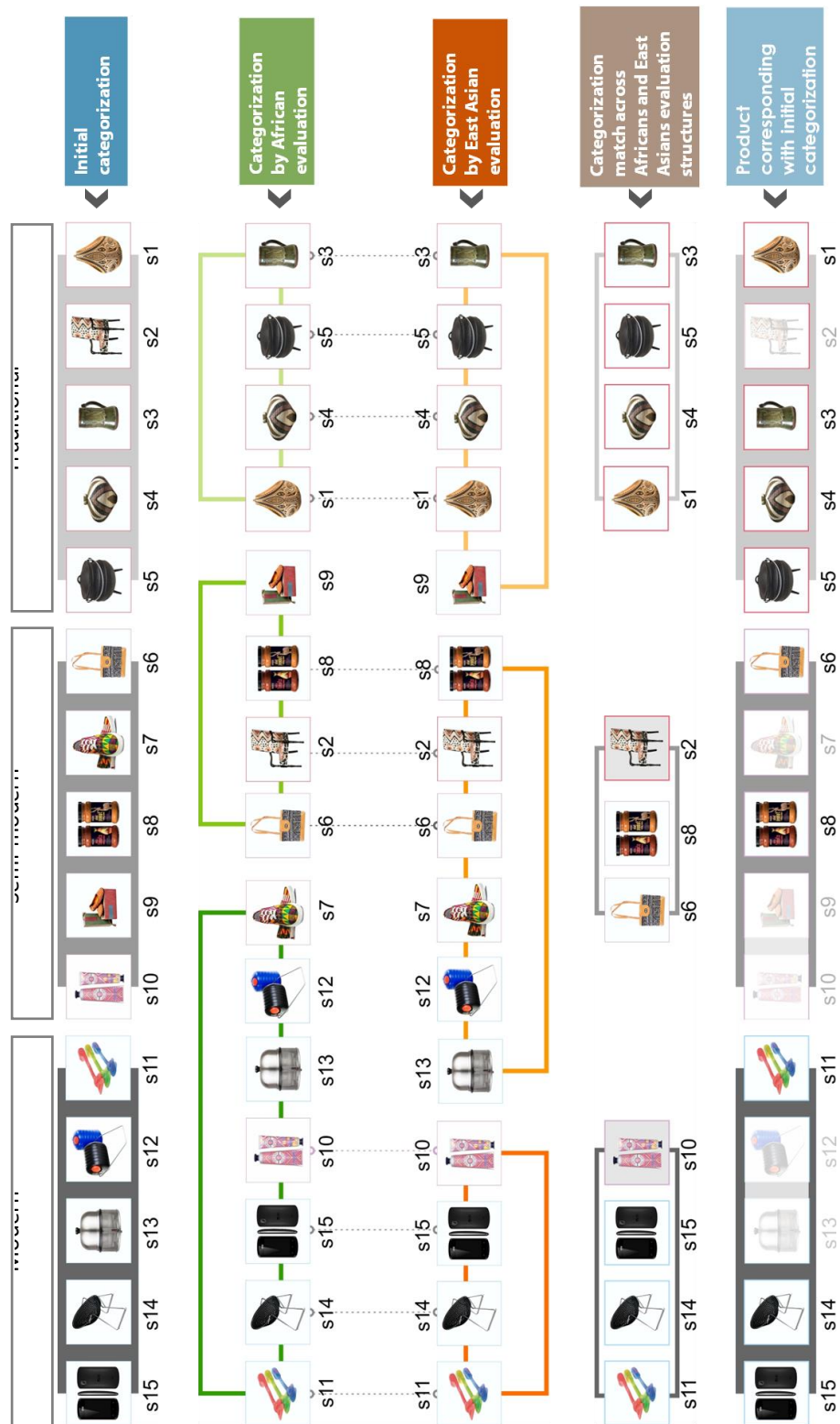


Figure 37. An expanded version of the cluster analysis using trendiness as a univariate

It is indicated from the results that the three level of categorization was obtained stably from the initial classification to the participants' evaluation. However, the level of match for product samples under each of the three categories differed for evaluation

responses from African and East Asian participants. For instance, product sample s2, which was initially classified under the group characterized as *traditional*, was excluded from the cluster group that combines four other product samples from the initial category. Also, other product samples which were not consistent with the evaluation responses by African and East Asian participants include s7, s9, s10, s12 and s12. Overall, it can be confirmed that 8 out of 15 of the product samples grouped under the initial classification actually corresponded with the product clusters generated from the evaluation responses of the African and East Asian participants.

With the inconsistency of the initial product categorization and the participants' product cluster types, subsequent analysis was without considering the three levels of classification as an evaluation factor.

### **6.3.2. Analyses of Means and Variance**

The results of analysis of means based on the evaluation responses from 12 rating scales – seven-point bipolar scale for 10 adjective pairs with 2 questions based on Likert scales. Because of a low number of female participants in the evaluation test, the rating scores of male and female respondents were combined while there was no analysis based on gender differences.

The charts in Figure 38 shows the distribution of the mean rating scores for 15 product samples as rated by the 2 regional cultures – African and East Asians. It is based on the comparative relationships of items values as visually perceived by the participants. The descriptive results suggest that for the all the evaluated objects, African participants gave assigned more positive ratings more than the East Asian participants. The gap in the evaluation ratings across the semantic scales were further tested for statistical significance by one-way Analysis of Variance (ANOVA).

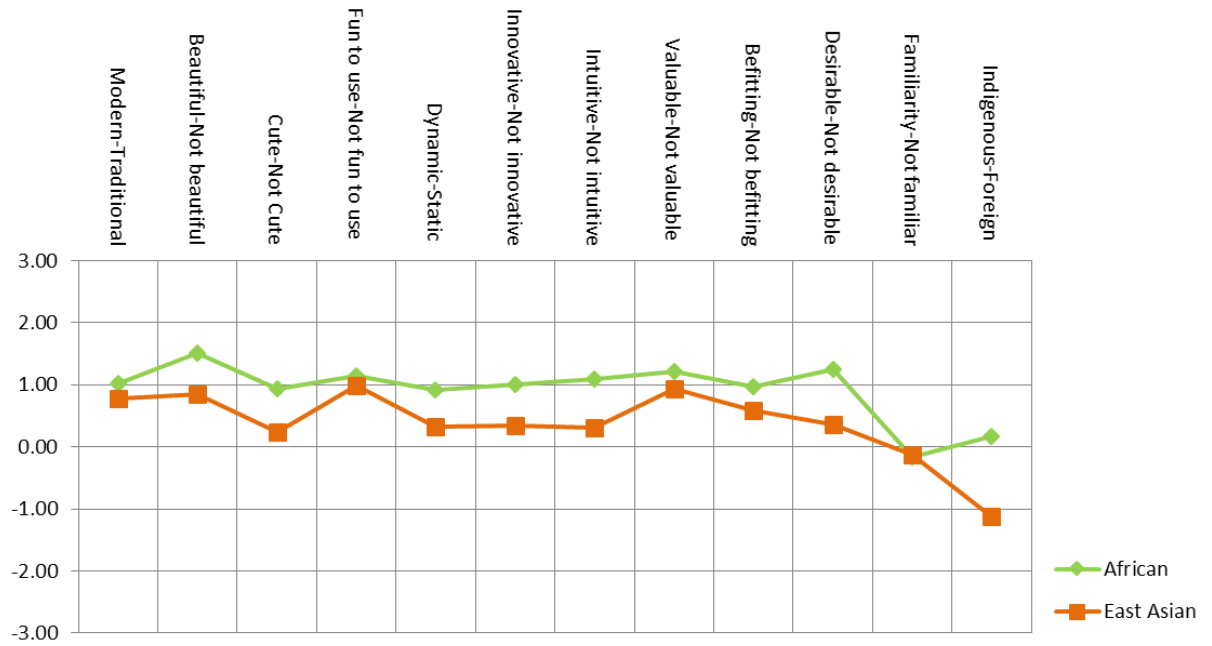


Figure 38. The charts present a mean distribution of the evaluation scores for all samples

Table 9. Summary of one-way ANOVA test for mean comparisons of semantic evaluation based on cultural regions

ANOVA Summary Table			
African and East Asian evaluation (Average)			
Dependent Variables		F <sup>a</sup>	*Sig.
1.	Modern-Traditional	1.354	.245
2.	Beautiful-Not beautiful	17.371	.000
3.	Cute-Not cute	14.539	.000
4.	Fun-to-use - Not fun-to-use	.428	.513
5.	Dynamic-Static	14.403	.000
6.	Innovative-Not innovative	18.281	.000
7.	Intuitive-Not intuitive	27.298	.000
8.	Valuable-Not valuable	3.227	.073
9.	Befitting-Not befitting	9.779	.002
10.	Desirable-Not desirable	30.001	.000
11.	Familiar-Not familiar	.420	.517
12.	Indigenous-Foreign	59.252	.000
*P <.05; a. Asymptotically F distributed			

Table 8 presents the output of the ANOVA analysis and statistical difference between the group means based on responses obtained from African and Asian participants. The results can be summarized as follows. As for the bi-polar variables *modern – traditional*, *fun-to-use – not fun-to-use*, *valuable – not valuable*, and *familiarity*, no significant differences were found in the evaluation ratings of African and East Asian participants for mean scores of all samples. This response implies that across the product samples, the perception of both African and East Asian based on the listed variables were somewhat closely related. It is worthy of note that while there was no difference in the perception of familiarity towards the samples (mostly bearing an African identity), the African participants still recognized them to be more indigenous significantly than the East Asian participants. This response thus suggests that African inspired products can be well recognized by East Asians. As for the remaining variables, there were significant differences in their evaluation ratings. The perception of these qualities can be termed to be more subjective while they also stand to differentiate the aesthetic feeling and preference between the African and East Asian participants towards the evaluated samples. To further characterize the perceptual differences between the two cultural regions (Africa and East Asia), factor analyses were carried.

### **6.3.3. Analyses of Principal Factors and Semantic Relation Maps**

To explore the structure of meaning through the reduction of semantic variables in relation to the visual impression of product attributes, a factor analysis was conducted using Principal Component Analysis (PCA) method. This analyzed dataset includes the following explanatory variables: *beautiful – not beautiful*, *cute – not cute*, *fun to use – not fun to use*, *dynamic – static*, *innovative – not innovative*, *intuitive – not intuitive*, *valuable – not valuable*, *befitting – not befitting*, *desirable – undesirable*, *familiarity* and *indigeneity*. Bartlett's test of sphericity was significant ( $p < 0.001$ ), therefore the hypothesis that the inter-correlation matrix involving the variables as an identity matrix was rejected. Nevertheless, the KMO scores for the dataset was only significant for the African evaluation scores but not for the East Asian scores (KMO indexes = 0.627 and 0.355 respectively). From the perspective of Bartlett's test, factor analysis is feasible. Table 10 shows the results of the factor loadings for African and East Asian evaluation scores. As for the African scores, a two-factor loading was obtained with variances being

57.059% and 21.849% respectively. On the other hand, for the East Asian scores produced a three-factor loading with variances being 41.699%, 23.251% and 12.538% respectively. For both African and East Asian main factor loadings, the Eigen values are shown to be larger than 1.0.

For the African evaluation structure, the first factor which accounts for 57.059 of the variance percentage, includes the variable set: *valuable – not valuable, beautiful – not beautiful, desirable – not desirable, cute – not cute, befitting – not befitting, dynamic – not static, fun-to-use – not fun-to-use, innovative – not innovative, and intuitive – not intuitive*. This component was named as the *Preference* factor, related to perception of aesthetic values and product sophistication. The second factor, which accounts for 21.849 of the variance percentage, includes the variable set: *indigeneity, modern – traditional, and familiarity*. This component was named the *Trendiness* factor which is related to product origin and familiarity.

For the East Asian evaluation structure, the first factor which accounts for 41.699 of the variance percentage includes the variable set: *modern – traditional, fun-to-use – not fun-to-use, familiarity, and innovative – not innovative*. This component was interpreted as the *Trendiness* factor, related to perception of product playfulness and innovativeness. The second factor, which accounts for 23.351 of the variance percentage, includes the variable set: *intuitive – not intuitive, cute – not cute, dynamic – not static, and indigeneity*. This component was named the *Intuitiveness* factor, related to perception of cuteness, sophistication and origin. The last factor which accounts for 12.538 of the variance percentage includes the variable set: *valuable – not valuable, beautiful – not beautiful, desirable – not desirable and befitting – not befitting*. This component was named the *Preference* factor, related to perception of product beauty and desirability.

Focusing on the characterization of product samples based on the evaluation variables, there are variations in the perception of African and East Asian participants based on aesthetics, trendiness and preference factors. For instance, the first component for African evaluation focused more on product valuableness in relation with aesthetic feelings and product sophistication. In contrast, for the East Asian evaluation, there is a tendency of placing more attention to product trendiness in relation to product playfulness, familiarity and innovativeness. More so, the elaboration of the main factor

loading to include a third component indicates a more complex structure of the evaluation by the East Asian participants than the African participants.

The factor loadings for the African and East Asian evaluations were used to derive a two-dimensional scatter maps in order to show the positions of the 15 product samples and the characteristics of product clusters (as in Figure 39). The perceptual differences in the evaluation of product samples based on the principal factors can be observed. In order to clarify the scatter maps, a hierarchical cluster analysis was applied using all the evaluation variables as shown in Figure 40. Within the range of the first two factor loadings, it can be observed that the evaluation of African and East Asian participants tends to be affected by the attribute of product trendiness whereas there is a variation in the orthogonal dimension. For instance, in the scatter maps presented in Figure 39, the first dimension (X axis) is *Preference* for the African scatter maps while for the East Asian, it represents the *Trendiness* factor. Relating the results of the scatter plots and the cluster analysis, the fundamental characteristics of the product samples enclosed within each cluster can be investigated. For example, a distinct feature of product grouping based on the visibility of traditional symbols and materials can be observed based on the evaluation structure in the scatter map and cluster chart derived for the African participants.

Table 10. The factor loadings of 12 variable set for African and East Asian evaluation scores

Africans				East Asians				
		1	2			1	2	3
1.	Valuable-Not valuable	.916		1.	Modern-Traditional	.965		
2.	Beautiful-Not beautiful	.914		2.	Fun-to-use - Not fun-to-use	.781	.515	
3.	Desirable-Not desirable	.896		3.	Familiar-Not familiar	.770		
4.	Cute-Not cute	.768		4.	Innovative-Not innovative	.742		
5.	Befitting-Not befitting	.864		5.	Intuitive-Not intuitive		.765	
6.	Dynamic-Static	.808	.515	6.	Cute-Not cute		.747	
7.	Fun-to-use - Not fun-to-use	.749		7.	Dynamic-Static		.734	
8.	Innovative-Not innovative	.674	.663	8.	Indigenous-Foreign		-.622	
9.	Intuitive-Not intuitive	.765		9.	Valuable-Not valuable			.861
10.	Indigenous-Foreign		-.919	10.	Beautiful-Not beautiful			.705
11.	Modern-Traditional		.878	11.	Desirable-Not desirable			.798
12.	Familiar-Not familiar		-.778	12.	Befitting-Not befitting	.541		.654
Eigen values (initial)		6.847	2.622	Eigen values (initial)		5.004	2.802	1.505
% of Variance		57.059	21.849	% of Variance		41.699	23.351	12.538
KMO - .627				KMO - .355				

Extraction method: Principal component analysis; Rotation method: Varimax with Kaiser

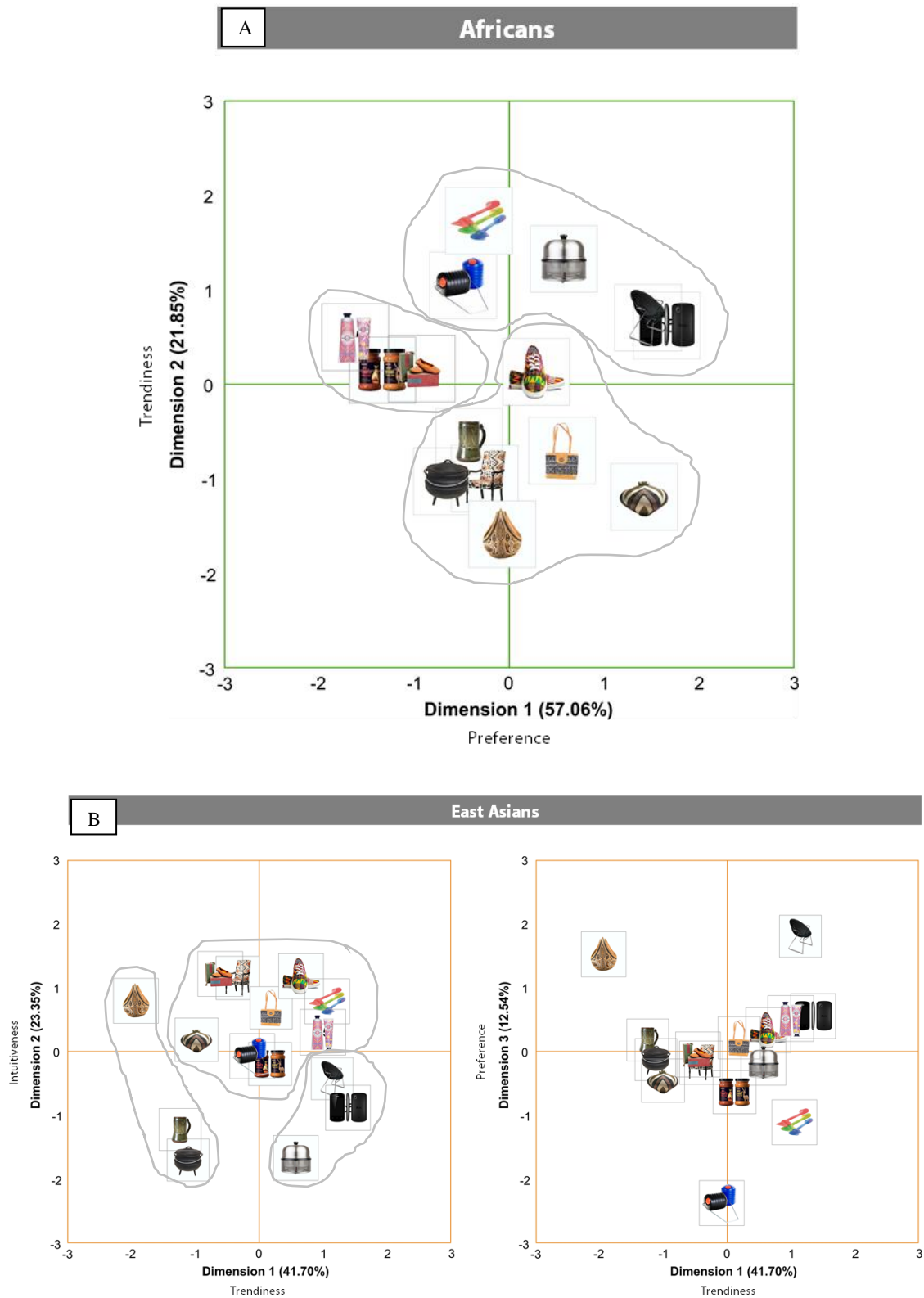


Figure 39. Scatter maps derived from PCA score plots for the African (A) and East-Asian (B) evaluation data.

The outlines defining three clusters of product samples in the first map for African and East Asian evaluations relate to the results of the cluster analysis shown in Figure 40



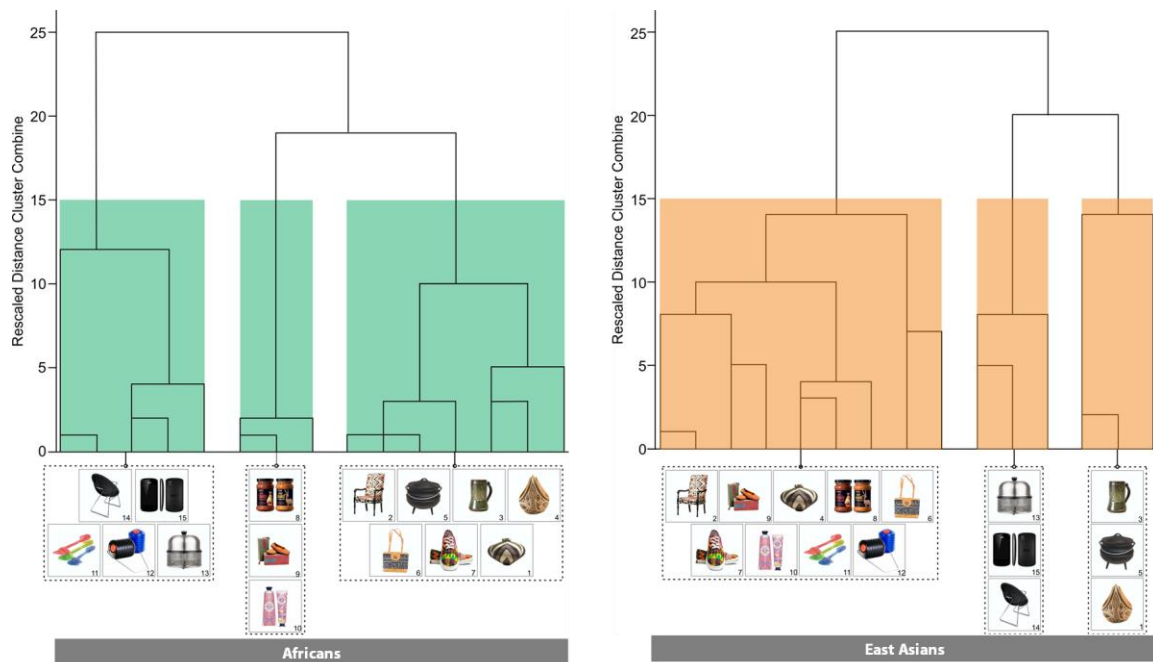


Figure 40. A hierarchical cluster analysis (Ward method) including all variable set for African and East Asian evaluations

#### 6.4. Discussion

In a pilot test for product evaluation, the study aimed to explore cross-culturally, the conceptual basis of users' values through the perception of product design appearances based on aesthetic feelings, trendiness and preference. To this end, 15 African inspired products were purposively selected and pre-classified into three categories, namely *traditional*, *semi-modern* and *modern*. Each class exhibits different level of visual expression in cultural symbols on the sampled products. Forty (40) participants (20 African and 20 East-Asian participants) studying at the University of Tsukuba voluntarily participated in this evaluation test covering about 30mins/participant. The participants carried out a visual evaluation of the selected product samples using provided evaluation scales. According to the study results of a univariate analysis using trendiness variable, the categorization by the African and East Asian participants persisted into three major clusters in line with initial product categorization. However, a little above half of the object samples which were classified in the same group also remained in the initial pre-category. Following the average distribution graph and analysis of variance based on evaluation difference of cultural groups, there was no

significant difference in the perception of trendiness and familiarity of product samples. Following the PCA result, the African evaluation structure tends to be simple while the East Asian's complex. Also, it was observed that in the case of African, the aesthetic variables – *cute* and *beautiful* – were combined with *value* whereas this was not same in the case of East Asian.

It was noted that the objects that were perceived to be culturally familiar by African participants, the East Asian participants tended to attribute high value. Meanwhile, the objects under the modern category were perceived to have high value for the Africans while the East Asians rated them low. This result suggests that the familiarity of objects with different cultures could play an influential role in the evaluation process. In spite of using African designed product samples which are assumed to be mostly familiar to the African participants, their recognition by both African and East Asian participants based on the three categories were consistent. This result indicates the continuum of traditional to modern product design could be perceived as a mark of product innovation. This finding tend to supports Hung's (2012) study which shows that trendiness is a predictor variable for product novelty. Following this result, it remains unclear whether these findings can reflect the individual nationalities representing Africa and East Asia. Therefore, in the main study for product evaluation, the research area was delimited to Japan and Nigeria, as two distinct cultural entities from diverse nationalities in Africa and East Asia. Furthermore, product samples which are inspired by Japanese design tradition was included in the stimulus set to investigate further on cross-cultural effects on visual aesthetic perception and value cognition.

Despite growing possibilities in the product development process achievable through technology transfer, design co-creation and collaboration, it seemingly appears that African consumers are yet to see an outgrowth of modern products from the continent. In our aforementioned survey, we noted that in the new age of design, some African countries seemed now have capabilities for developing modern products. For example, South Africa, which is an industrialized country with much Western influence, began exploring a way of grafting the African identity onto Western European technology towards a new synthesis. In fact, this country has served as the origin for almost all the product items grouped under the modern category except for the VMK smartphone that was developed by an entrepreneur in Congo.

From this study, overall, we deduced that the impression users get through perceiving products visually can contribute to determining the value assigned to them. In addition, the familiar qualities and social significance of products as perceived through visual information may influence product evaluation and preference. It is a popular opinion that one of the biggest challenges of local design in developing nations is proper recognition and acceptance by the locals. As most countries are now emphasizing and developing their creative industries (small medium and micro enterprises), this orientation is expected to change. However, in order for local design industry to thrive in a global market, there has to be a drive to achieving a holistic balance and seamless integration of aesthetic values throughout the tangible and intangible aspects of product design. Also, the growing need for a better understanding of cross-cultural perception may have a far-reaching effect on the global market, engendering untapped potentials for globalization of local product designs. Nevertheless, it remains unclear whether our findings reflect same characteristic response from individual nationalities representing Africa and East Asia. In our future study, we will attempt to delimit our study area while investigating cross-cultural effects on perception of product design qualities using more product samples from East-Asian cultures.

## **6.5. Concluding Remarks**

Essentially, this study has demonstrated that the impression users get through perceiving products visually can be far-reaching in determining the value they place on them. (Crilly et al., 2004) rightly noted that the visual appearance of products is a critical determinant of consumer response and product success. To a large extent, the surficial, functional and symbolic levels of aesthetic perception in products through visual information influences the evaluative judgments and frequently focus on the nature of a consumer's desired product qualities which aligns with his/her aesthetic values.

## **6.6. Product Evaluation Test II**

### **6.6.1. Introduction**

In the main study, there is anticipation to further clarification on the findings from the Product Evaluation Test I. Hence, this test was set to examine cross-culturally, the conceptual basis of perceiving aesthetic values in product design characterized as being traditional and modern, using product samples with design origin from African and

Japanese cultures. At this study phase, product samples with Japanese creative origin were selected and incorporated into the stimuli set. Hence, there is a platform for an evaluation using images of cross-cultural objects.

### 6.6.2. Participants

This study includes mainly university students who volunteered to participate in the study. In Japan, there were participation of 56 Japanese students at the University of Tsukuba (Female=25 and male=31). Their ages ranged between 18 and 33, with 26 of them having art/design related background. In Nigeria meanwhile, 100 students at the Federal University of Technology Akure, mostly composed of the Yoruba ethnic group<sup>34</sup>, volunteered to take part in the study (Female=29 and male=71). Their ages also ranged from 18-33, with 50 of them having art/design related background (Figures 41-44). Four Japanese and one Nigerian participant's responses were excluded from further analysis due to frequent omission in the filling of the response sheets. Four out of all the Japanese participants reported to have lived in a foreign country over a year while only one of the Nigerian participants has had such experience. This additional information about place lived above one year was collected in order to monitor and minimize the effect of biculturalism<sup>35</sup> on the overall participants' responses (Table 11).

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<sup>34</sup> The Yoruba, mostly located around West African countries, are one of the largest African ethnic groups south of the Sahara Desert (population about 5.3million). Within Nigeria, the cultural group dominates the western part of the country, sharing from a broader knowledge of social practices, educational system and an Anglo-national language with other sub-cultural groups. They are, in fact, a matrix of diverse people bound together by a common language, history, and values. Yoruba mythology holds that all Yoruba people descended from a hero called Odua or Oduduwa, even though most of the people now shares Christianity and Islamic beliefs with a smaller percentage of traditional worshippers. The Yoruba language, characterized by several dialects, belongs to the Congo-Kordofanian language family.

(see <http://www.everyculture.com/wc/Mauritania-to-Nigeria/Yoruba.html#ixzz3FJTFNUrl>)

<sup>35</sup> Biculturals are individuals who have been exposed extensively to two cultural meanings. Studies in cultural psychology have shown that bicultural individuals appear to have access to constructs from different cultural meaning systems they share, making them easily susceptible to *cultural priming* and *frame-switching* based on situational differences in *accessibility* and *availability*, and *culture sampling* caused by differences in *situational applicability* (see Hong, 2009; Hong & Mallorie, 2004)

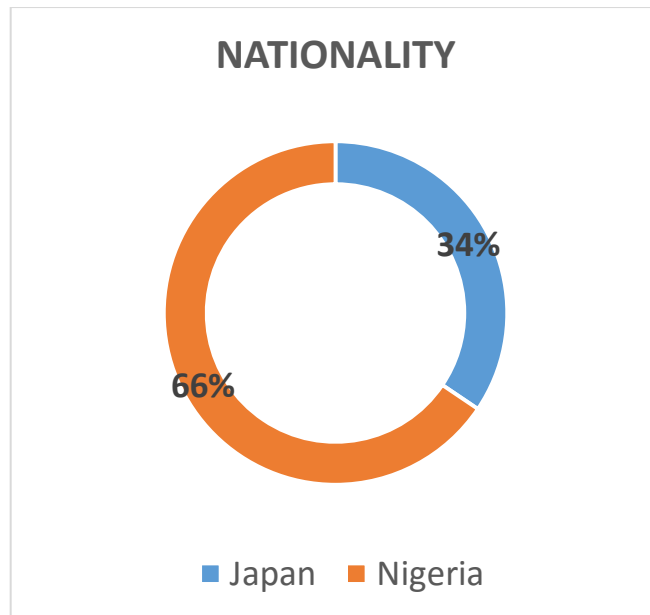


Figure 41. The participants' profile based on nationality

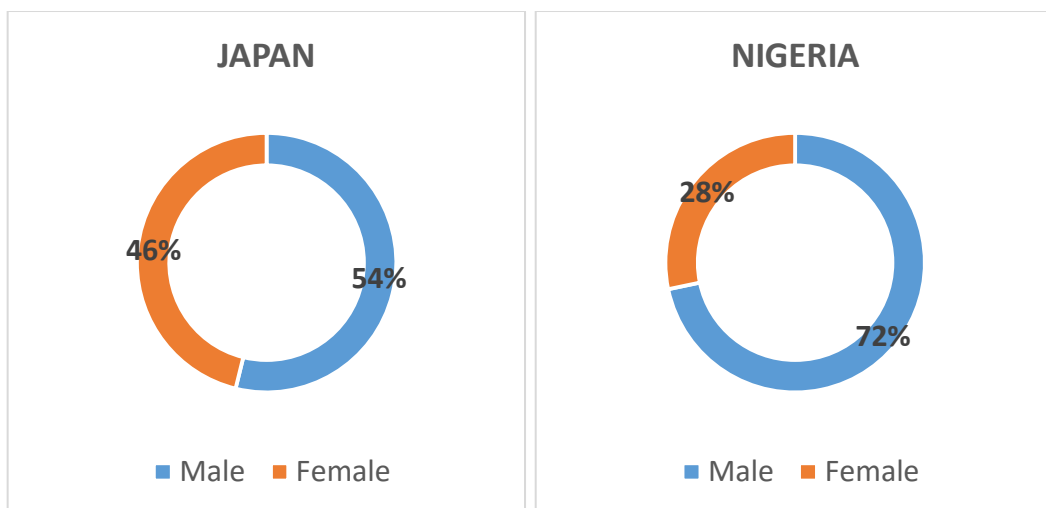


Figure 42. Participants' profile based on gender

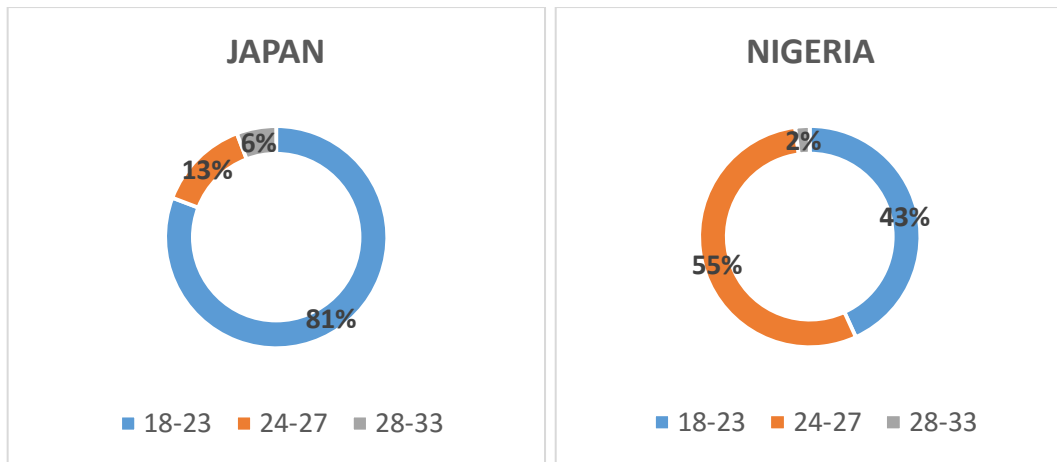


Figure 43. Participants' profile based on age group

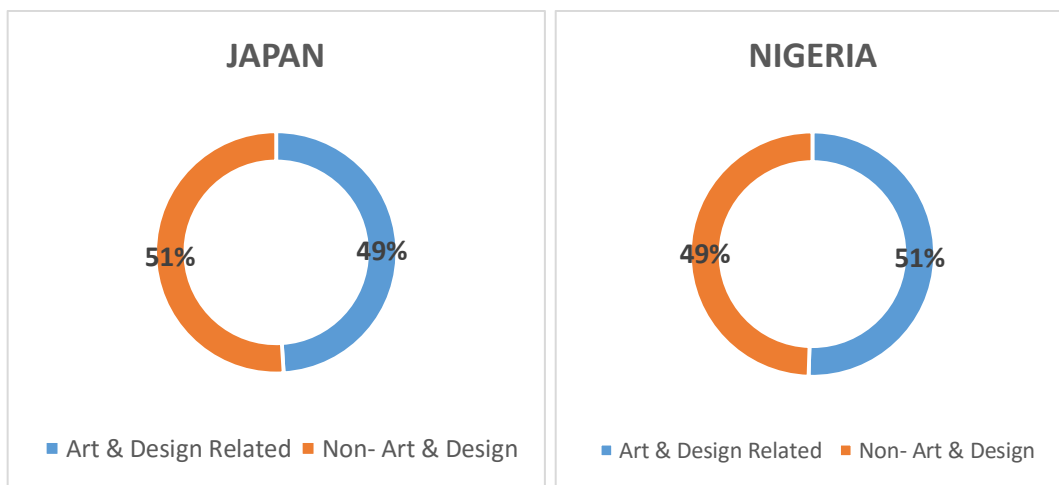


Figure 44. Participants' profile based on higher educational training

Table 11. Summary of participants' profiles (valid responses)

Gender		Age		Higher educational training	
JAPAN					
Male	28	18-23	42	Art & Design Related	25
Female	24	24-27	7	Non- Art & Design	26
		28-33	3	Unspecified data	1
					52
NIGERIA					
Male	71	18-23	41	Art & Design Related	50
Female	28	24-27	52	Non- Art & Design	49
		28-33	2		
		Unspecified data	4		
					99

### 6.6.3. Evaluation Words/ Phrases

The selection of evaluation words and phrases were developed and expanded from the previous set of bipolar pairs used for the product evaluation test I. Similarly to the preceding test, the set was derived based on the aesthetic perception model proposed by the study which draws a parallel with Norman's and Lin's theories. The evaluation pairs adopted are presented under the 6 priori descriptive groups:

1. Surfacial aesthetics: *Cute – Not Cute; Cool – Not Cool*
2. Functional aesthetics: *Intuitive – Not Intuitive; Simple – Complex*
3. Symbolic aesthetics: *Valuable – Not Valuable;*
4. Trendiness: *Traditional – Modern*
5. Familiarity: *Familiar – Not familiar; Indigenous – Foreign;*
6. Preference: *Like to look at – Don't like to look at; Like to use – Don't like to use; Like to have – Don't like to have*

### 6.6.4. Procedures

The data acquisition from participants in Japan was conducted at the University of Tsukuba main campus. This was carried out with two physical space conditions, on the premise of recruiting participants within a limited time frame and an affordable cost. In another condition, the experimental task was conducted with individual subject inside a waiting room, using a computer display as the viewing screen. On the other hand, the task was administered to collective groups of participants at the same time in lecture or laboratory rooms, with the aid of a projector screen. Meanwhile in Nigeria, the data collection from participants was conducted in lecture rooms within the main campus of the University of Technology Akure, at different point in time (firstly with a batch of design students and subsequently with a group of non-design students). The experimental stimuli were displayed with the aid of projector screens. Some pictures of actual test scenes are shown in the appendix section of the thesis.

To begin the test process, participants were briefed while being given an eighteen-page response sheet headed with an instruction for the participants to read in order know the purpose of the research, and to indicate their consent to participate in the whole experimental task. Thereafter, they were asked to fill out basic background information.

In general, the experimental tasks were made-up in two parts. The first part presents a series of twelve set questions for cognitive style test while the second main part bears replicates of SD scales for the evaluation of thirty-three (33) product stimuli (a range of 16 African and 17 Japanese product samples). In between the cognitive and the product evaluation tasks, starting from the beginning and at the tail end, the participants were also asked to fill out a combined set of mood and the SAM scales. This was to express their state of emotion in the course of the component tasks. In total, it took approximately 30 min to collect a completed response on an individual or collective basis. The response form for all the Japanese participants was prepared in Japanese language while the one for the Nigerian participants was done in English.

For the test process, participants were presented with visual images of 33 product samples and asked to evaluate each of them using replicates of SD scale (cf. Figure 45) provided. Each image slide was automatically set to display for 10 secs, after which the participants can do a semantic evaluation. A set of SD scale contains 11 bipolar words, most of which were adapted from the preliminary product evaluation test. After completing the evaluation, the participants were asked to make free comment and appreciated for their participation. A description of the test scene is shown in Figure 46.

Extremely ←		Neutral									→ Extremely								
4		3		2		1		0		1		2		3		4			
Familiar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not familiar		
Traditional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Modern		
Cute	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not Cute		
Cool	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not Cool		
Intuitive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Logical		
Valuable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not valuable		
Simple	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complex		
Indigenous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Foreign		
Like to look at	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Don't like to look at		
Like to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Don't like to use		
Like to have	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Don't like to have		



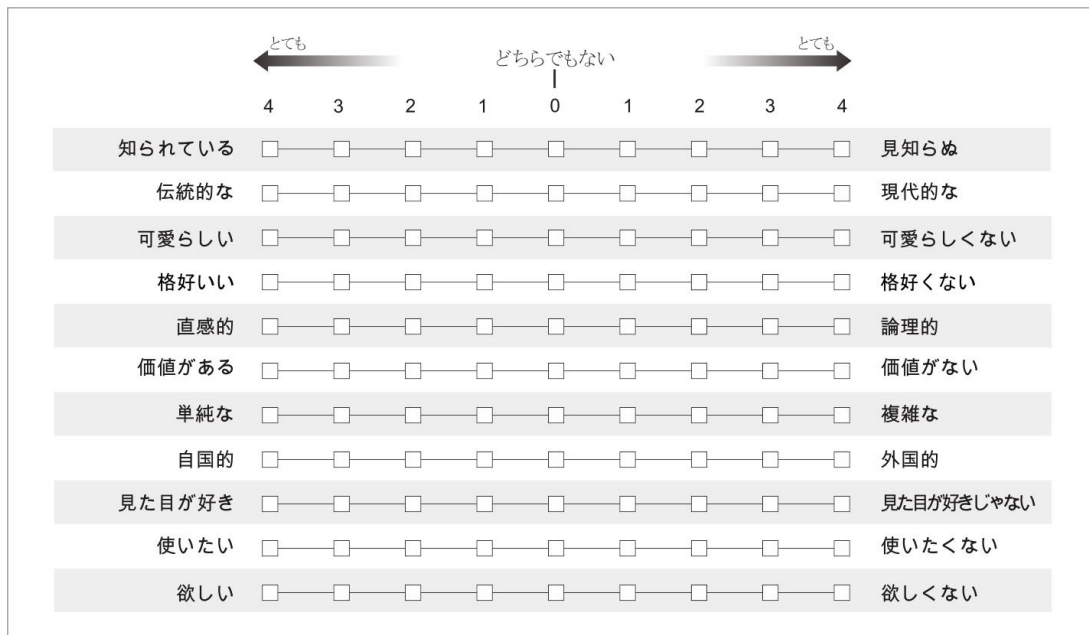


Figure 45. 9-point SD Scale (Top: Japanese version and below: English version)

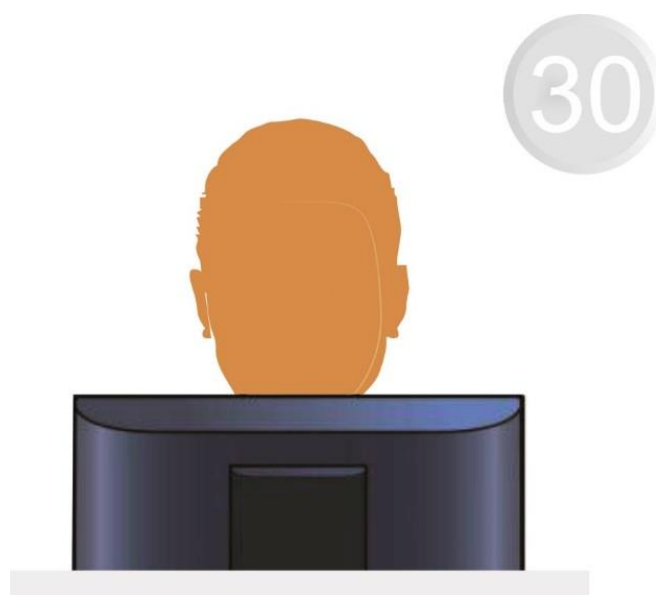


Figure 46. Test scenario with an individual participant

### 6.6.5. Stimuli Development

Stimuli consisted of thirty-three (33) product stimuli (a set of 16 African and 17 Japanese product samples) as shown in Figure 47. The African product samples used for the preliminary product evaluation test were adopted with an additional one sample to be included within the typical traditional product category. However, to develop the Japanese product samples, an exploratory sampling approach was taken. For a pre-

selection, fourteen Japanese design students from the product design department of the University of Tsukuba (female=7, male=7) were asked to choose (up to fifty) typical Japanese product design with traditional and modern orientations using four scholarly books on Japanese product design. The students are mostly in graduate schools and thus considered to have a high level of design experience. Initially, a total of two hundred and seventy-four (274) product items were selected by the participants. An example of a basic product design nomenclature is illustrated in Figure 48. Further description on the African and Japanese product samples can be seen in the Appendix section of the thesis.

Further screening procedures was undertaken to reduce the sample size considerable. To achieve this, a visual categorization was carried on the samples by sorting them based on the frequency of selections for each sample, and also by traditional and modern classification. In extension, a group selection of semi-modern product samples was created by matching product that was picked as both modern and at the same time, traditional. As much as possible, the following rules of selection were applied to arrive at a number of samples close to the sample size of the previously selected African products:

- To screen out all the item picked only by one subject.
- To rank each item based on the frequency of selection by the subject.
- To select item, first considering the frequency of their selection (top-down approach).
- To give preference to everyday items found within the same or closely related product category for African product samples, in order to minimize the diversity of the product samples and also to keep a fair ground for comparison. For instance, item categories within furniture design, tableware (ceramic and glass design), storage vessels, kitchens, shoe and lifestyle and accessories (body-care product package design), communication product design (smartphone) etc. were considered.
- To keep out product items within the category of automobile product (e.g. cars) or electrical devices (e.g. sound systems). Such were excluded because they are not included within the African product sample group.

- In case of getting a rare product equivalent, such as a product match for the African water roller sample, an approximate product sample were selected based on closeness of shared attributes, particularly in term of use.

Having considered the above-listed criteria, along with advice from a product design faculty member at the University of Tsukuba, fifteen product samples were chosen. Furthermore, an additional two samples were added later, making up to seventeen (17) samples altogether. This was done to increase the content in the traditional and semi-modern categories.

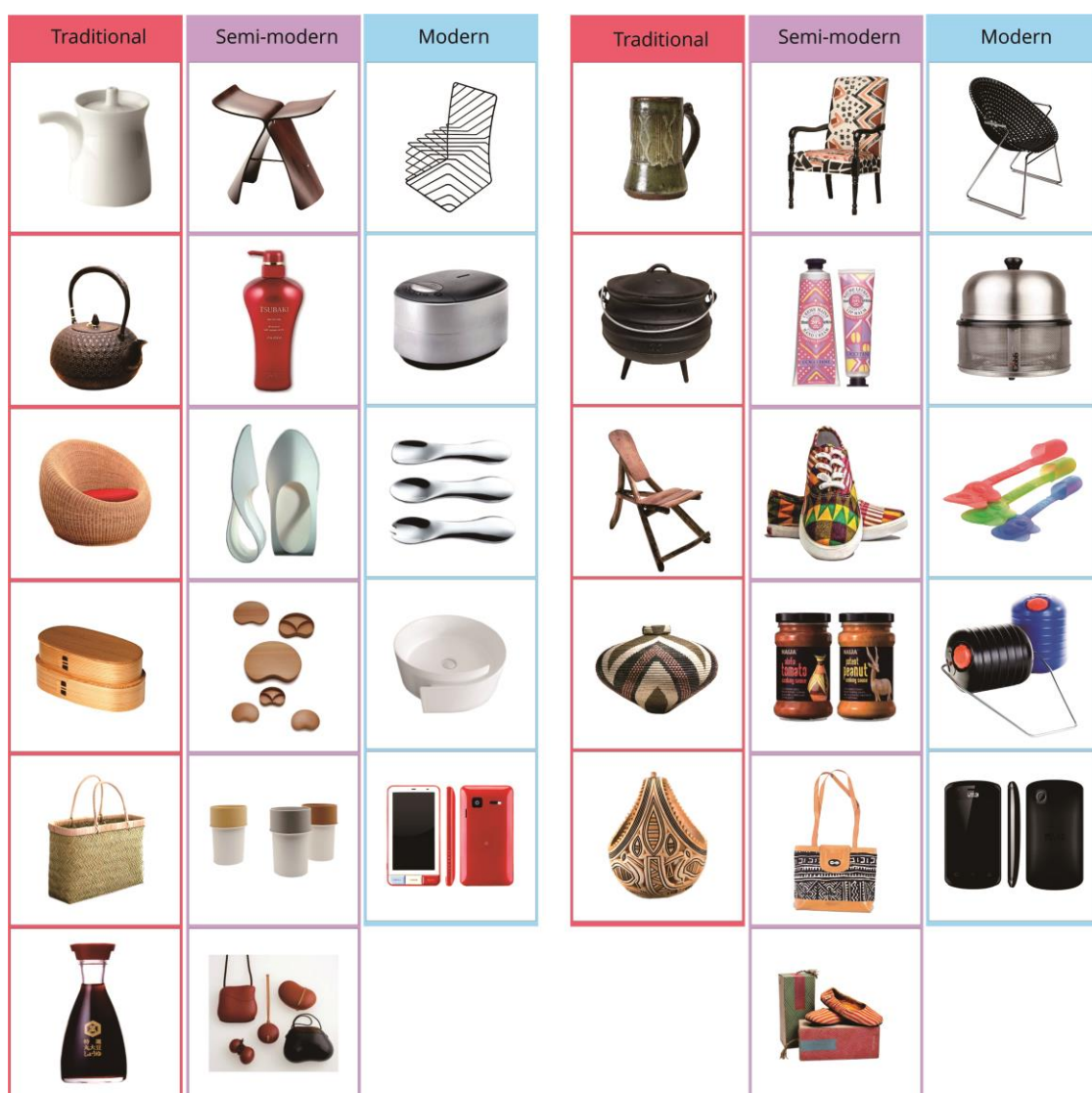


Figure 47. An overview of 33 stimulus set selected for a cross-cultural evaluation.

Note: The product images were initially classified by the researcher under three categories – *Traditional*, *Semi-modern* and *Modern*. (Left: 17 Japanese product samples and Right: 16 African product samples)

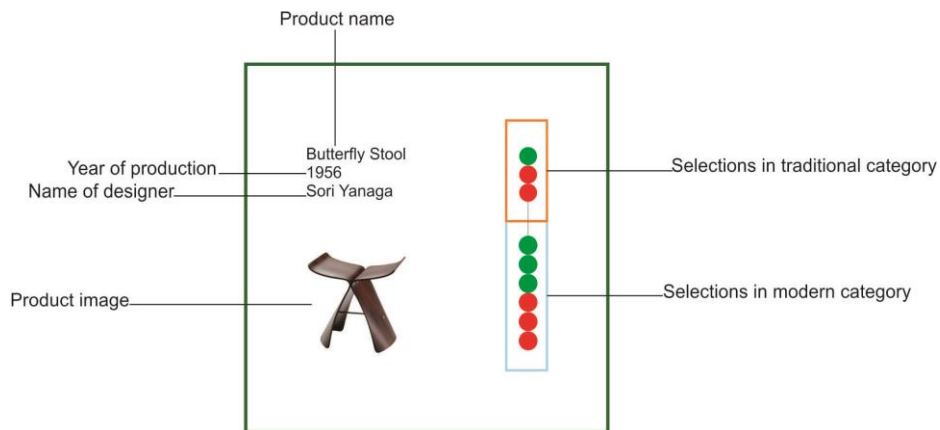


Figure 48. An example of a basic product design nomenclature, *the butterfly stool* designed by Sori Yanagi

#### 6.6.6. Assumptions

Table 12 and Figure 49 show a model for the cross-cultural evaluation process in both endogenous and exogenous conditions. Following previous studies on consumer ethnocentrism and attitudes toward domestic product and foreign products (Watson & Wright, 2000; Balabanis, & Diamantopoulos, 2001; Watson, Lysonski, Gillan, & Raymore, 2002), it was expected that participants may hold feelings of distance towards other country's product while favoring the evaluation of their domestic products with a sense of patriotism and pride of association.

Table 12. Framework for perceptual combinations for indigenous and foreign product designs

Culture of the evaluator		Japanese	Nigerian
		Evaluation conditions	
Product origin	Japan	Endogenous	Exogenous
	Africa	Exogenous	Endogenous

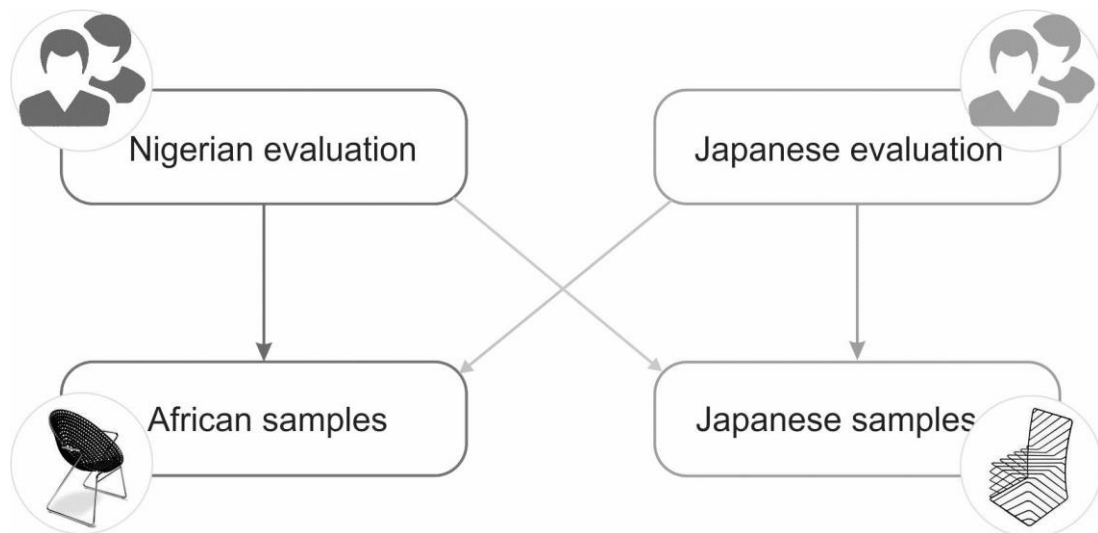


Figure 49. A cross-evaluation model (an endogenous and exogenous evaluation conditions)

## 6.7. Analyses and Results

Valid responses were obtained from 151 participants (52 Japanese, 99 Nigerians). Various psychometric analyses were performed using the evaluation scores collected from the test. The results will be described and discussed under the following sections based on the analytical methods used. A combination of Microsoft Excel and SPSS software were used to classify the dataset and carry out all the data analyses.

### 6.7.1. Analysis of Means

Firstly, a descriptive analysis was performed to interpret the data. The means of the evaluation scores based on the 11 bipolar semantic pairs is conducted and described as follows. The analysis of means was done to show the average distribution of the perceptual ratings performed towards the African and Japanese inspired product samples that were presented to the Japanese and Nigerian participants. As indicated above, the rating scores were derived by endogenous and exogenous evaluation conditions. The chart in Figure 50 shows the relationship of ratings of the Nigerian evaluation of African samples vis-à-vis Japanese evaluation of African samples. The distribution indicates that on an aggregate, the Nigerian participants are more familiar with the African samples than the Japanese participants. In addition, the Nigerian participants gave more positive ratings in their perception of the aesthetic and preference factors than the Japanese participants except for rating for intuitiveness. The chart in Figure 51 shows the relationship of ratings of the Nigerian evaluation of Japanese samples vis-à-vis Japanese evaluation of Japanese samples. The distribution of the means shows that the Japanese

participants tend to be more familiar with the Japanese samples more than the Nigerian participants. The Nigerian participants tend to perceive the Japanese samples as modern and foreign while they assign more positive ratings for their perception of aesthetics, value and preference as compared to the Japanese response. As for the chart in Figure 52, the relation between the distribution of means for the Nigerian evaluation of African samples and the Nigerian evaluation of Japanese samples can be seen. The Nigerian participants perceived the Japanese samples to be modern, less intuitive and foreign in origin, relative to their evaluation of African samples. Moreover, the Nigerian participants assigned more positive ratings to the Japanese samples than for the African samples in their appraisal for aesthetics, value and preference. The chart in Figure 53 demonstrates that compared to the response of the African participants, the Japanese participants assigned more positive evaluation ratings to the Japanese samples for their perception of familiarity, aesthetics, value, simplicity and preference factors. In exception, the Japanese participants had a similar view of trendiness and intuitiveness for both African and Japanese samples. Overall, it is indicated in Figure 54 that the Japanese samples are most positively rated by the Nigerian participants based on aesthetic, value and preference factors. While the level of familiarity rating of Nigerian participants towards the Japanese samples is almost as low as that of Japanese participants towards the African samples, they tend to perceive the Japanese samples as most modern, but least intuitive. On the other hand, the evaluation ratings of the Japanese participants relatively showed lowest ratings for the African samples based on aesthetic, value and preference factors.

Although it appears that there is a perceptual gap between the Japanese and Nigerian evaluation responses, an analysis for variance is considered relevant to show the significance of differences within and across variables. Furthermore, other inferential analyses were performed to interpret the data. These include factor analysis (PCA), discriminant analysis and multiple regression tests. The results obtained from these analyses are presented as follows.



Figure 50. Distribution of means for the Nigerian evaluation of African samples (NIG\_EVAL\_AS) in relation with the Japanese evaluation of African samples (NIG\_EVAL\_AS)

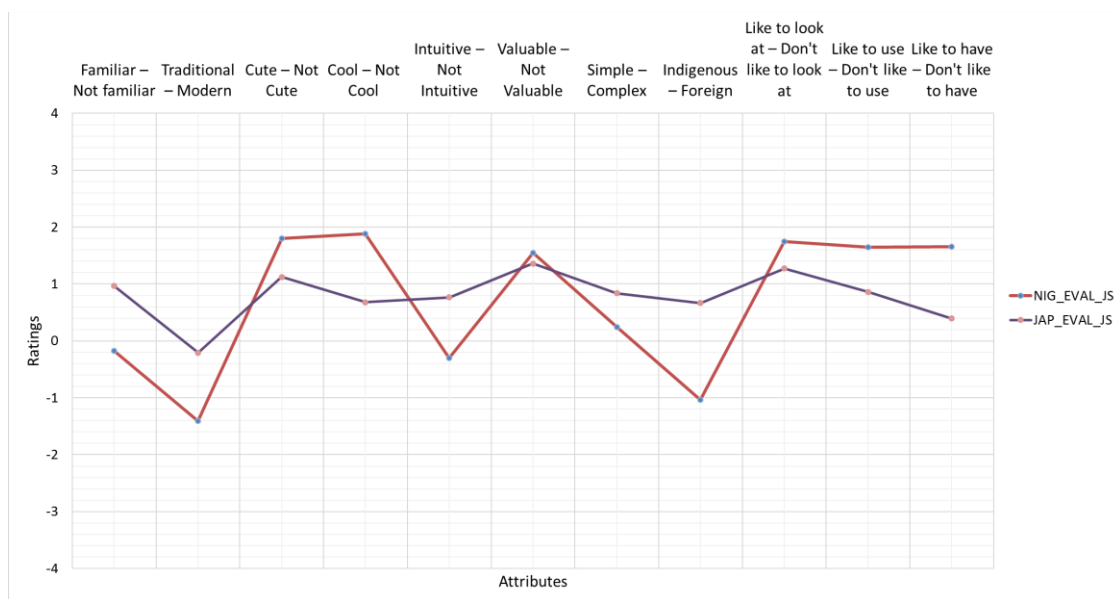


Figure 51. Distribution of means for the Nigerian evaluation of Japanese samples (NIG\_EVAL\_JS) in relation with the Japanese evaluation of Japanese samples (NIG\_EVAL\_JS)

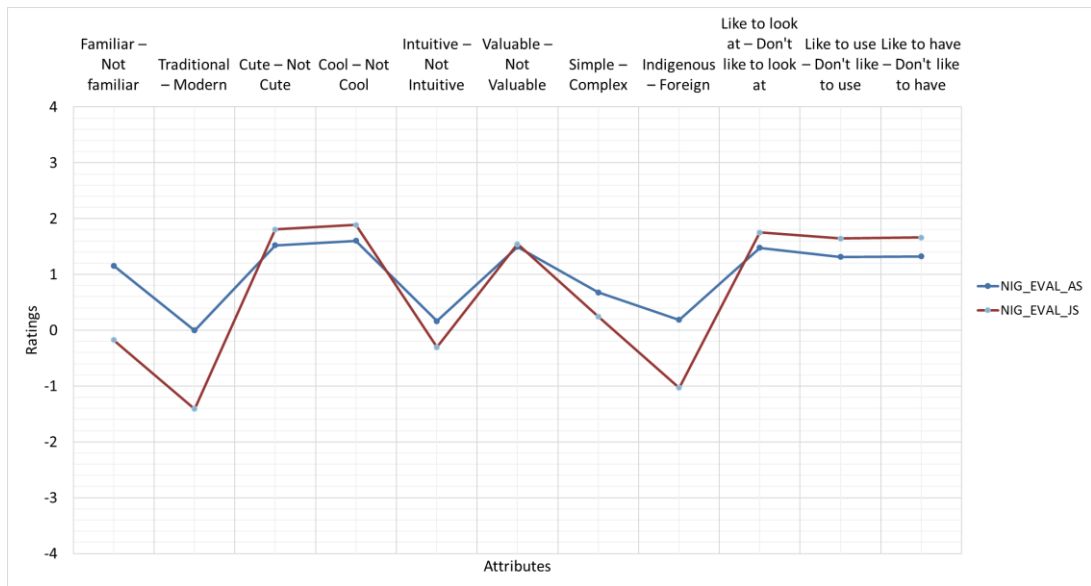


Figure 52. Distribution of means for the Nigerian evaluation of African samples (NIG\_EVAL\_AS) in relation with the Japanese evaluation of African samples (NIG\_EVAL\_JS)

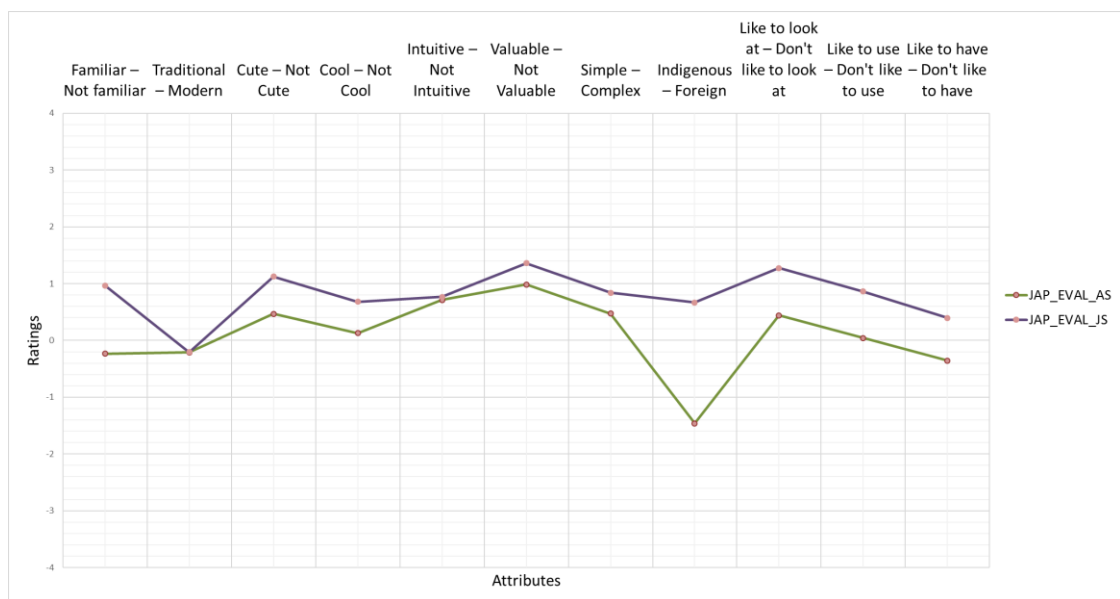


Figure 53. Distribution of means for the Japanese evaluation of African samples (NIG\_EVAL\_AS) in relation with the Japanese evaluation of Japanese samples (NIG\_EVAL\_AS)



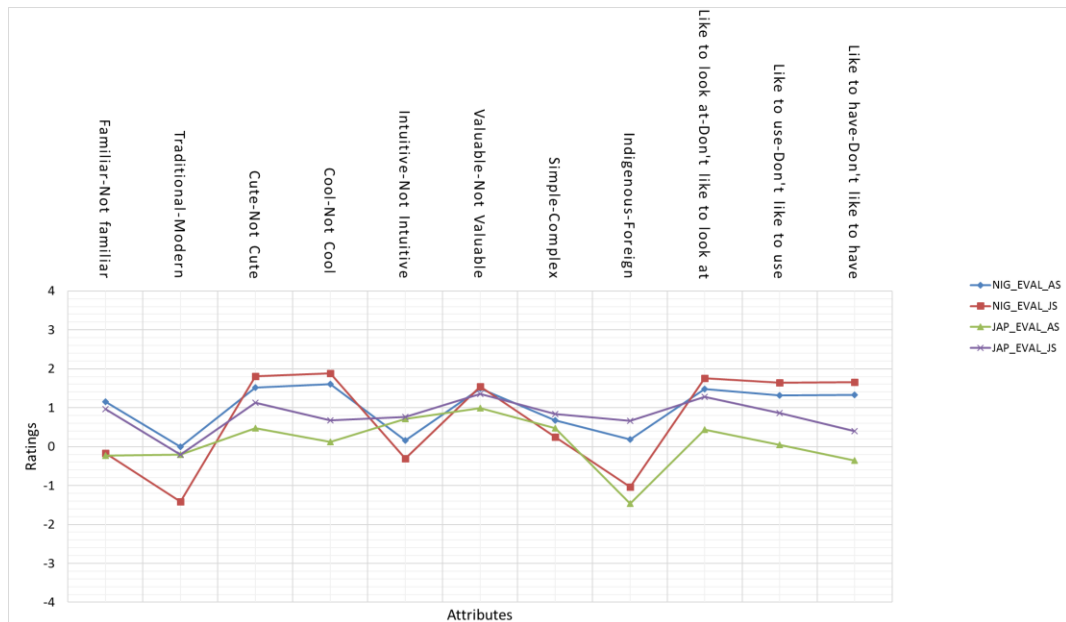


Figure 54. A combined distribution of means relating the evaluation ratings of Nigerian and Japanese participants towards African and Japanese samples.

(Keys: NIG\_EVAL\_AS - Nigerian evaluation of African samples; NIG\_EVAL\_JS - Nigerian evaluation of Japanese samples; JAP\_EVAL\_AS - Japanese evaluation of African samples; JAP\_EVAL\_JS - Japanese evaluation of Japanese samples)

### 6.7.2. Analysis of Variance

According to the ANOVA results, the perceptual ratings of product samples based on the evaluation scores (average) was statistically significantly different in between the two cultural groups, except for the variables *valuable-not valuable* [Welch's  $F(3, 156.673) = 4.588$ ] and *simple-complex* [Welch's  $F(3, 142.706) = 3.830$ ] for  $p > .0005$  (cf. Figure 55).

Since the Welch ANOVA was statistically significant for almost all the evaluation variables, the Games-Howell post-hoc test was applied to determine where exactly the differences lie (Table 13). The post-hoc test provides confidence intervals for the differences between group means and reveals if when the differences are statistically significant. Under the evaluation conditions (endogenous and exogenous), six ways was identified to explore group differences (*JAP\_EVAL\_JS* vs. *JAP\_EVAL\_AS*; *NIG\_EVAL\_AS* vs. *JAP\_EVAL\_AS*; *NIG\_EVAL\_AS* vs. *JAP\_EVAL\_JS*; *NIG\_EVAL\_JS* vs. *JAP\_EVAL\_AS*; *NIG\_EVAL\_JS* vs. *JAP\_EVAL\_JS*; *NIG\_EVAL\_JS* vs. *NIG\_EVAL\_AS*). Across the evaluation variables, the Nigerian participants rated showed tendencies for more positive responses in terms of aesthetic feeling of cuteness and

coolness and three preference levels indicated by liking to see, liking to use and liking to have, compared to Japanese response.

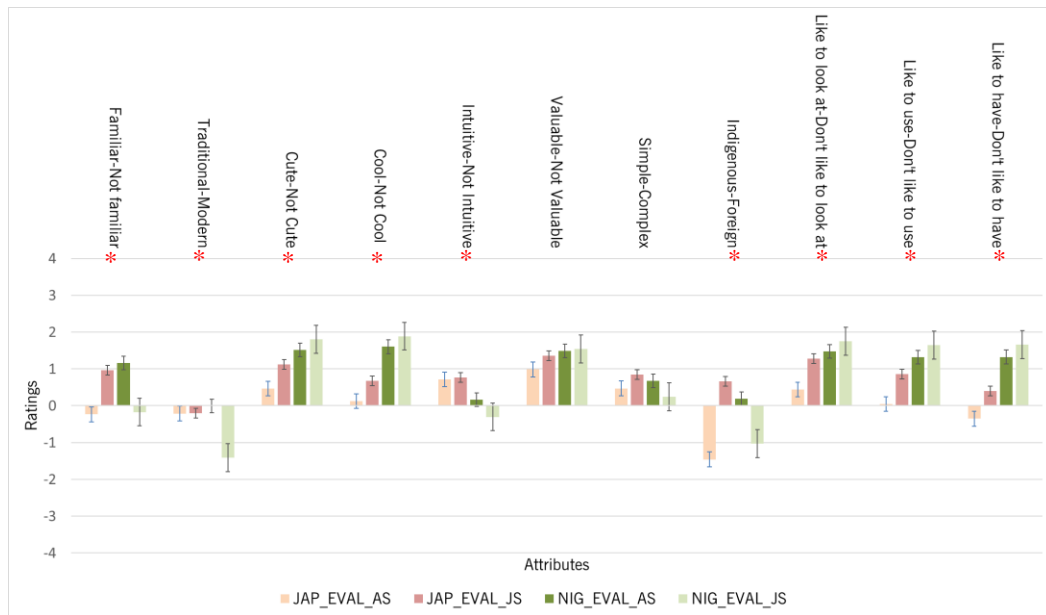


Figure 55: Bar chart showing average ratings for Japanese and Nigerian responses based on endogenous and exogenous conditions. (\* Significant at  $p < 0.05$ )

Table 13: Post-hoc test (Games-Howell) for evaluation by subject nationality and product origins

Semantic Variables	Category A (JAS)		Category B (JJS)		Category C (NAS)		Category D (NJS)	
	Mean [Lower Bound, Upper Bound]	*Sig with	Mean [Lower Bound, Upper Bound]	*Sig with	Mean [Lower Bound, Upper Bound]	*Sig with	Mean [Lower Bound, Upper Bound]	*Sig with
Familiar – Not familiar	-.230 [-.545, .085]	B, C	.972 [.726, 1.218]	A, D	1.158 [.924, 1.393]	A, D	-.173 [-.442, .096]	B, C
Traditional – Modern	-.208 [-.398, .019]	D	-.199 [-.423, .026]	D	-.004 [-.185, .177]	D	-1.410 [-1.703, 1.116]	A, B, C
Cute – Not Cute	.467 [.209, .724]	B, C, D	1.128 [.823, 1.432]	A, D	1.520 [1.242, 1.799]	A	1.805 [1.503, 2.107]	A, B
Cool – Not Cool	.122 [-.122, .367]	B, C, D	.683 [.368, .997]	A, C, D	1.602 [1.309, 1.894]	A, B	1.887 [1.581, 2.194]	A, B
Intuitive – Not Intuitive	.716 [.535, .897]	A, C, D	.773 [.472, 1.073]	C, D	.165 [-.104, .435]	A, B	-.304 [-.610, .001]	A, B
Valuable – Not Valuable	.990 [.786, 1.194]	C, D	1.363 [1.216, 1.599]	.	1.494 [1.222, 1.766]	A	1.544 [1.231, 1.857]	A
Simple – Complex	.469 [.216, .722]	.	.844 [.524, 1.165]	D	.681 [.454, .907]	D	.245 [.009, .481]	B, C
Indigenous – Foreign	-1.460 [-1.726, -1.194]	B, C	.676 [.380, .972]	B, C, D	.189 [-.004, .381]	B, C, D	-1.031 [-1.300, -.763]	B, C
Like to look at – Don't like to look at	.442 [.173, .711]	B, C, D	1.277 [.987, 1.567]	A	1.479 [1.210, 1.749]	A	1.753 [1.457, 2.048]	A
Like to use – Don't like to use	.047 [-.185, .279]	B, C, D	.867 [.573, 1.161]	A, D	1.317 [1.051, 1.583]	A	1.645 [1.345, 1.945]	A, B
Like to have – Don't like to have	-.352 [-.618, .085]	B, C, D	.398 [.063, .733]	A, C, D	1.325 [1.056, 1.594]	A, B	1.660 [1.357, 1.962]	A, B

\*The categories represented in letters significantly differ with the means at  $p < .05$  in the Games Howell post-hoc significant difference comparison. Numbers in brackets are 95% confidence intervals of the means. The post ANOVA test – Games-Howell was adopted to compensate for the differences in variances between groups as revealed by the Test of Homogeneity of Variances.

### 6.7.3. Factor Analysis

A factorial analysis was carried out on the dataset using the PCA method. This analysis was applied to explore further the characteristic tendencies in the evaluation based on the differences of cultural perceptual structure. According to Table 14, the factor loadings for the data extraction from Japanese evaluation of all product samples produced three component factors that had eigenvalues greater than one and which explained 45.5%, 13.5% and 10.8% of the variance, respectively. The two-component solution thus explained 69.8% of the total variance. This data proved suitable for factor analysis with Kaiser-Meyer-Olkin = .805 and Bartlett's test of Sphericity = 0.000. The three main components showed same categorical characteristics as the PCA result of the collective evaluation except in a different factor order –aesthetic value, recognition value and origination value. However, the factor loadings from the Nigerian evaluation of all product samples revealed two components that had eigenvalues greater than one and which explained 51.5% and 20.5% of the variance, respectively. The two-component solution thus explained 72.0% of the total variance. While the first component retained a factor loading with same variables as in the case of the Japanese evaluation, the second component however combined the variables describing both origination and recognition values (including factors such as indigeneity, trendiness, familiarity, simplicity, and intuitiveness).

Tables 14: Rotated component matrix for PCA with varimax rotation showing evaluation of all product samples by nationality (Left – Japanese evaluation; Right – Nigerian evaluation)

Descriptions	Attributes		
	1	2	3
Liking to look at	<b>.908</b>	.115	.126
Liking to use	<b>.907</b>	.040	.136
Liking to have	<b>.890</b>	.125	.072
Cuteness	<b>.785</b>	.190	.135
Coolness	<b>.741</b>	.372	.050
Valuableness	<b>.593</b>	.001	.322
Intuitiveness	.091	<b>.858</b>	-.008
Simplicity	.233	<b>.832</b>	.161
Traditionality	-.171	.279	<b>.751</b>
Familiarity	.428	-.138	<b>.697</b>
Indigenesness	.444	.022	<b>.526</b>
<b>Eigenvalues</b>	5.003	1.483	1.186
<b>% of Variance</b>	45.486	13.485	10.779
<i>KMO Sampling Adequacy</i>			.805
<i>Barlett's Test of Sphericity</i>			0.000

Descriptions	Attributes	
	1	2
Liking to look at	.955	.014
Coolness	.952	.011
Cuteness	.940	-.010
Liking to use	.935	-.004
Liking to have	.927	.003
Valuableness	.860	.029
Indigenesness	-.247	<b>.845</b>
Traditionality	-.517	<b>.706</b>
Familiarity	.164	<b>.638</b>
Simplicity	.343	<b>.586</b>
Intuitiveness	.000	<b>.554</b>
<b>Eigenvalues</b>	5.665	2.255
<b>% of Variance</b>	51.502	20.496
<i>KMO Sampling Adequacy</i>		.828
<i>Barlett's Test of Sphericity</i>		0.000

Overall, three levels of preference (*'like to...'*) are correlated. As shown in Table 14 and 15, familiarity is not related to evaluation of preference which also included the aesthetic feelings). From the result of the PCA based on combined evaluation, the first component was represented by aesthetic value, the subjective and intuitive feeling in the evaluation process. This can also be described as a tendency to evaluate an object based on affection. Component 2 showed high loadings for variables describing product origin, familiarity and trendiness. Thus, this axis was attributed as origination value. As shown in the third component factor of evaluation variables, perception of simplicity and intuitiveness does not correlate with preference or value of beauty expressed by cuteness or coolness. Rather, the effect of simplicity and intuitiveness works according to the target object and perceptual style of evaluation based on culture.

Table 15. Rotated component matrix for PCA with varimax rotation in respect to different nationalities and product origins

PCA - JAPANESE EVALUATION OF JAPANESE SAMPLES			
Descriptions	Attributes		
	1	2	3
Liking to use	.934	.080	.067
Liking to look at	.902	.145	.119
Liking to have	.888	.179	-.047
Cuteness	.829	.150	.120
Coolness	.692	.466	-.106
Valuableness	.636	.101	.239
Indigenouness	.469	.331	.408
Intuitiveness	.063	.899	.058
Simplicity	.316	.839	.135
Traditionality	-.075	.067	.840
Familiarity	.203	.038	.775
Eigenvalues	5.165	1.503	1.280
% of Variance	46.951	13.668	11.632
KMO Sampling Adequacy			.774
Barlett's Test of Sphericity			0.000

PCA - JAPANESE EVALUATION OF AFRICAN SAMPLES				
Descriptions	Attributes			
	1	2	3	4
Liking to look at	.926	.154	.001	.106
Liking to use	.914	.105	-.025	-.107
Liking to have	.903	.173	.028	-.050
Coolness	.612	.265	.226	.331
Cuteness	.556	.395	.124	.439
Valuableness	.305	.679	-.143	.175
Familiarity	.253	.751	-.067	-.163
Simplicity	.096	-.238	.865	-.012
Traditionality	-.107	.491	.704	-.053
Intuitiveness	.139	-.274	.559	.436
Indigenouness	.028	.016	.009	-.912
Eigenvalues	4.003	1.830	1.180	1.123
% of Variance	36.393	16.639	10.730	10.207
KMO Sampling Adequacy				.723
Barlett's Test of Sphericity				0.000

PCA – NIGERIAN EVALUATION OF JAPANESE SAMPLES		
Descriptions	Attributes	
	1	2
Liking to look at	.957	.023
Coolness	.952	-.031
Liking to use	.942	.050
Cuteness	.936	-.055
Liking to have	.930	.041
Valuableness	.872	-.064
Traditionality	-.718	.478
Indigenouness	-.451	.726
Intuitiveness	.045	.726
Simplicity	.337	.575
Familiarity	-.054	.447
Eigenvalues	6.106	1.769
% of Variance	55.511	16.081
KMO Sampling Adequacy		.810
Barlett's Test of Sphericity		0.000

PCA - NIGERIAN EVALUATION OF AFRICAN SAMPLES			
Descriptions	Attributes		
	1	2	3
Cuteness	.941	-.048	.068
Coolness	.940	-.055	.123
Liking to look at	.937	-.041	.072
Liking to use	.923	-.010	-.026
Liking to have	.918	.002	.014
Valuableness	.848	.034	.046
Familiarity	.648	.092	.100
Traditionality	-.204	.888	-.026
Indigenouness	.158	.875	.216
Intuitiveness	-.088	.009	.910
Simplicity	.385	.319	.628
Eigenvalues	5.771	1.883	1.032
% of Variance	52.468	17.117	9.385
KMO Sampling Adequacy			.828
Barlett's Test of Sphericity			0.000

#### 6.7.4. Discriminant Analysis

A discriminant analysis was carried out to investigate differences between the two evaluation conditions (endogenous and exogenous), the nationalities (Japanese and Nigerian participants), and the product origins (African and Japanese inspired designs). The analysis was carried out in reference to the attributes of the dependent variables (semantic descriptors), indicating which attributes contribute most to group differences in the semantic evaluation of product samples. Furthermore, the linear combinations of attributes known as canonical discriminant functions (equations) which contribute maximally to group separation are identified. In all dichotomous conditions, the Wilks' lambda sig values were  $<.005$ . This indicates that the grouping will make predictions that are statistically significant in their accuracy.

In Table 16 below, the outcome of the attitude to the samples evaluation based on 'endogenous' and 'exogenous' condition was considered, so only one function is displayed. The canonical correlation is the multiple correlations between the predictors and the discriminant function. With only one function it provides an index of overall model fit which is interpreted as being the proportion of variance explained ( $R^2$ )<sup>36</sup>. In this case, a canonical correlation of .304 suggests the model explains 9.2% of the variation in the grouping variable - endogenous and exogenous. The interpretation of the discriminant coefficients standardized canonical discriminant function coefficients table, show that the variables familiar/not familiar and indigenous/foreign (.486, .795) are the strongest predictor and of greater value to the cross evaluation effects – endogenous and exogenous. Other variables were less successful as predictors. In the Group Centroids table, in the endogenous condition produced a mean of .323 while the exogenous produced a mean of -.316.

In Table 17 below, the outcome of the attitude to the samples evaluation based on nationality was considered, so only one function is displayed. In this case, a canonical correlation of .210 suggests the model explains 4.41% of the variation in the grouping variable for product origins as African and Japanese inspired designs. The outlook of the

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<sup>36</sup>  $R^2$  as the coefficient of determination is a number that indicates how well data fit a statistical model (i.e. the *goodness of fit*)

discriminant coefficients standardized canonical discriminant function coefficients table, show that the descriptor variables *traditional-modern*, and *indigenous-foreign* (.840, -.596) have the strongest predictors and serve of greater value to the product origin effects – Japan and Nigeria. Other variables were less successful as predictors. The Group Centroids Table, in the case of African product origin produced a mean of .222 while the Japanese product origin produced a mean of -.209.

In Table 18 below, the outcome of the attitude to the samples evaluation based on nationality was considered, so only one function is displayed. In this case, a canonical correlation of .382 suggests the model explains 14.6% of the variation in the grouping variable in terms of nationality – Japan and Nigeria. The outlook of the discriminant coefficients standardized canonical discriminant function coefficients table, show that the descriptor variables *cool-not cool*, *like to use-don't like to use*, and *like to have-don't like* (.806, -.558, 1.153) were the strongest predictors and serve of greater value to the nationality effects – Japan and Nigeria (Table 31). Other variables were less successful as predictors. The Group Centroids Table, in the case of Japanese nationality produced a mean of -.570 while the Nigerian nationality produced a mean of .299.

Table 16. Discriminant factor [endogenous/ exogenous evaluation conditions]

	Standardized Canonical Discriminant Function Coefficients	endogenous/ exogenous Evaluations	
		endogenous	exogenous
Familiar/ Not familiar	.486	.066	-.036
Traditional/ Modern	-.060	-.020	-.007
Cute/Not Cute	.041	.086	.075
Cool / Not Cool	-.084	.025	.048
Intuitive / Not Intuitive	.033	.017	.009
Valuable / Not Valuable	.026	.212	.204
Simple / Complex	-.051	.066	.079
Indigenous / Foreign	.795	.025	-.163
Like to look at / Don't like to look at	.046	.142	.129
Like to use / Don't like to use	.072	.093	.075
Like to have / Don't like to have	-.152	-.198	-.161
(Constant)		-1.045	-1.076
Fisher's linear discriminant functions			

Eigenvalues				
Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.102 <sup>a</sup>	100.0	100.0	.304
a. First 1 canonical discriminant functions were used in the analysis. A canonical correlation of .304 suggests the model explains 9.2% of the variation in the grouping variable – endogenous- and exogenous evaluations.				

Table 17. Discriminant factor (Product Origins – African and Japanese inspired designs)

	Standardized Canonical Discriminant Function Coefficients	Product Origin	
		African	Japanese
Familiar/ Not familiar	.366	.040	-.011
Traditional/ Modern	.840	.045	-.075
Cute/Not Cute	-.286	.055	.106
Cool / Not Cool	.073	.043	.030
Intuitive / Not Intuitive	.166	.027	-.001
Valuable / Not Valuable	.138	.221	.194
Simple / Complex	.104	.081	.063
Indigenous / Foreign	-.596	-.113	-.022
Like to look at / Don't like to look at	-.256	.112	.160
Like to use / Don't like to use	-.233	.064	.104
Like to have / Don't like to have	.097	-.172	-.188
(Constant)		-.984	-1.080
Fisher's linear discriminant functions			

Eigenvalues				
Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.046 <sup>a</sup>	100.0	100.0	.210
a. First 1 canonical discriminant functions were used in the analysis. A canonical correlation of .210 suggests the model explains 4.41% of the variation in the grouping variable – African product origin and Japanese product origin.				

Table 18. Discriminant factor [Nationalities – Japan and Nigeria]

	Standardized Canonical Discriminant Function Coefficients	Nationality	
		Japan	Nigeria
Familiar/ Not familiar	-.035	.021	.012
Traditional/ Modern	.004	-.015	-.013
Cute/Not Cute	-.068	.096	.071
Cool / Not Cool	.806	-.159	.150
Intuitive / Not Intuitive	-.432	.108	-.042
Valuable / Not Valuable	-.341	.295	.158
Simple / Complex	-.063	.086	.064
Indigenous / Foreign	.135	-.094	-.053
Like to look at / Don't like to look at	-.297	.206	.094
Like to use / Don't like to use	-.558	.208	.012
Like to have / Don't like to have	1.153	-.427	-.037
(Constant)		-1.095	-1.096
Fisher's linear discriminant functions			

Eigenvalues				
Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.171 <sup>a</sup>	100.0	100.0	.382
a. First 1 canonical discriminant functions were used in the analysis. A canonical correlation of .382 suggests the model explains 14.6% of the variation in the grouping variable in terms of nationality – Japan and Nigeria.				

Overall, the discriminant analysis shows that the evaluation of familiarity mostly served to differentiate between the product samples under the endogenous and exogenous evaluation conditions. In the category of the nationalities, the aesthetic variable – cool and the preference attitudes (*like to use* and *like to have*) showed the largest effect as predictor. For the product samples, the sense of product origin and trendiness showed the strongest effect as predictor. As shown by the values of canonical correlation, generally, the results of the discriminant analysis tend not be effective enough to show the differential factors based on the evaluations of the Japanese and Nigerian participants (Tables 16-18). This necessitated the application of the regression analysis on the evaluation responses.

#### 6.7.5. Multiple Regression Analysis (Step-Wise Method):

From the results of the PCA, a tendency for a high interaction effect among the variables operationalizing attitudes of preference and other variables was observed. Hence, a multiple regression analysis was used to identify significant predictors that could be effective towards predicting the attitudes of preference in terms of their effect sizes.

Table 19. Summary of Regression analysis for variables predicting attitudes of preference for mean ratings of all product samples

A- Like to look at						
Predictors	Japan			Nigeria		
	Unstandardized Coefficients		Standardized Coefficients $\beta$	Unstandardized Coefficients		Standardized Coefficients $\beta$
	B	SE (B)		B	SE (B)	
Familiar-Not familiar	.041	.015	.055			
Traditional-Modern	-.038	.014	-.051	-.054	.013	-.070
Cute-Not Cute	.326	.018	.414	.229	.023	.232
Cool-Not Cool	.314	.020	.301	.300	.024	.299
Intuitive-Not Intuitive						
Valuable- Not Valuable	.178	.024	.144	.293	.015	.290
Simple -Complex				.034	.012	.039
Indigenous-Foreign	.098	.016	.119	.038	.014	.047
(Constant)	.211	.050		.228	.036	
$R^2$	.483			.554		
F	198.971*			506.663*		
*p< .05						
B- Like to use						
Predictors	Japan			Nigeria		
	Unstandardized Coefficients		Standardized Coefficients $\beta$	Unstandardized Coefficients		Standardized Coefficients $\beta$
	B	SE (B)		B	SE (B)	
Familiar-Not familiar	.114	.017	.139	.009	.011	.012
Traditional-Modern	-.101	.017	-.124	-.091	.015	-.110
Cute-Not Cute	.192	.021	.191	.267	.027	.252
Cool-Not Cool	.332	.024	.298	.219	.028	.203
Intuitive-Not intuitive						
Valuable-Not Valuable	.275	.028	.206	.311	.018	.288
Simple-Complex	.059	.023	.054	.006	.014	.007
Indigenous-Foreign	.097	.019	.109	.024	.016	.028
(Constant)	-.194	.060		.123	.042	
$R^2$	.376			.467		
F	128.825*			356.453*		
*p< .05						
C- Like to have						



Predictors	Japan			Nigeria		
	Unstandardized Coefficients		Standardized Coefficients $\beta$	Unstandardized Coefficients		Standardized Coefficients $\beta$
	<i>B</i>	<i>SE (B)</i>		<i>B</i>	<i>SE (B)</i>	
Familiar-Not familiar	.086	.018	.101	.029	.012	.035
Traditional-Modern	-.076	.017	-.090	-.109	.016	-.128
Cute-Not Cute	.237	.022	.225	.271	.028	.248
Cool -Not Cool	.365	.025	.314	.217	.030	.194
Intuitive-Not intuitive						
Valuable-Not Valuable	.322	.029	.231	.317	.019	.283
Simple-Complex	.062	.024	.054			
Indigenous-Foreign	.066	.020	.071	.035	.017	.039
(Constant)	-.739	.061		.105	.044	
$R^2$	.398			.453		
$F$	140.891*			336.981*		
* $p < .05$						

Presented in Table 19A-C is a summary of the regression analysis for variables predicting three levels of preferential attitudes towards all the product samples. As indicated in Table 19A, from the evaluation response by the Japanese participants, six evaluation variables added statistically significant to the prediction of *like to look at* [ $F(8, 1707) = 2.430, p < .0005, \text{adj. } R^2 = .483$ ]. These predictors are listed in a decreasing order of their effect sizes (beta coefficients): *cute-not cute*; *cool-not cool*; *valuable-not valuable*; *indigenous-foreign*; *familiar-not familiar*; and *traditional-modern*. For the Nigerian participants' response, six evaluation variables added statistically significantly to the prediction of *like to look at* [ $F(8, 3257) = 2.517, p < .0005, \text{adj. } R^2 = .554$ ]. In a decreasing order of their effect sizes (beta coefficients), the predictors include: *cool-not cool*; *valuable-not valuable*; *cute-not cute*; *traditional-modern*; *indigenous-foreign*; and *simple-complex*.

As shown in Table 19B, six evaluation variables added statistically significant to the prediction of *like to look use* for the Japanese response [ $F(8, 1707) = 3.418, p < .0005, \text{adj. } R^2 = .376$ ]. The predictors include: *cool-not cool*; *valuable-not valuable*; *cute-not cute*; *familiar-not familiar*; *traditional-modern*; and *simple-complex*. Six significant predictors also emerged from the Nigerian participants' evaluation response effective towards *like to look use* [ $F(8, 3258) = 3.445, p < .0005, \text{adj. } R^2 = .467$ ]. These include: *cool-not cool*; *valuable-not valuable*; *cute-not cute*; *traditional-modern*; *indigenous-foreign*; and *simple-complex*.

According to Table 19C, seven predictors were statistically significant to the prediction of *like to look have* for the Japanese response [ $F(8, 1707) = 3.593, p < .0005, \text{adj. } R^2 = .398$ ]. These include: *cool-not cool*; *valuable-not valuable*; *cute-not cute*; *familiar-not familiar*; *traditional-modern*; *indigenous-foreign*; and *simple-complex*. On

the other hand, six predictors were statistically significant to the prediction of like to look have for the Nigerian response [ $F(8, 3258) = 3.806, p < .0005, \text{adj. } R^2 = .453$ ]. These include: *valuable-not valuable*; *cute-not cute*; *cool-not cool*; *traditional-modern*; *indigenous-foreign*; and *familiar-not familiar*.

As can be seen in the regression analysis result presented in Table 26 using a step-wise method, the preference *like to look at* was mostly attributed to the feeling of aesthetic factors - *cute* and *cool*. Likewise, this tendency was also found with the preferences *like to use* and *like to have*. On the basis of cross-cultural similarity, overall, the evaluation variables *cool-not cool*, *cute-not cute* and *valuable-not valuable*, were mostly effective for predicting the three levels of preference (*like to look at*, *like to use* and *like to have*) for the Nigerian and Japanese participants. On point of cross-cultural differences, for the Japanese participants, the preference *like to look at* was highly dependent on ratings of *cuteness* and *coolness*, the preference *like to use* on ratings of *coolness* and *value* and the liking 'to have' on ratings of *cuteness*, *coolness* and *value*. On the other hand, for the Nigerian participants, both preference *like to look at* and *like to use* was highly dependent on ratings of physical attraction *cute*, *cool* and *valuable*, while the preference *like to have* only on *cute* and *valuable*. For the three levels of preferential attitudes, the rating of *value* was relatively higher in the evaluation done by the Nigerian participants, whereas this variable was only significant in the evaluation of preferences *like to use* and *like to have* for the Japanese participants. These results holistically point to a cross-cultural pattern in attitudes of preference including all the product samples.

Furthermore, the regression analysis of cross-cultural evaluation based on the differentiation of product origin was carried out. As can be seen from the summary of result for the evaluation of African samples, the Japanese evaluation by aesthetic *cool* and *cute* were largely effective to predict their preference of *like to look at* ( $R^2 = .411$ ) whereas for their preferences of *like to use* and *like to have*, the rating of only *cool-not cool* prevailed ( $R^2 = .334$  and  $R^2 = .335$  respectively). Meanwhile, for the Nigerian participants' evaluations of African samples, variables *cool-not cool*, *valuable-not valuable* and *cute-not cute* were mostly effective to predict the preference of *like to look* ( $R^2 = .549$ ). However, for the prediction of the preferences of *like to use* and *like to have*,

the most rated predictive variables were *cute-not cute* and *valuable-not valuable* ( $R^2=.447$  and  $R^2=.429$  respectively).

Table 20. Summary of Regression analysis with African product samples only

A- Like to look at (African samples)						
Predictors	Japan			Nigeria		
	Unstandardized Coefficients		Standardized Coefficients $\beta$	Unstandardized Coefficients		Standardize d Coefficients $\beta$
	B	SE (B)		B	SE (B)	
Familiar- Not familiar						
Traditional- Modern	-.045	.021	-.057	-.060	.018	-.081
Cute-Not Cute	.373	.031	.348	.208	.031	.214
Cool - Not Cool	.373	.026	.409	.332	.032	.332
Intuitive- Not intuitive						
Valuable-Not Valuable	.131	.036	.103	.278	.021	.278
Simple -Complex				.036	.017	.039
Indigenous- Foreign	.126	.027	.131	.041	.020	.051
(Constant)	.265	.080		.184	.051	
R <sup>2</sup>	.411			.549		
p< .05						
B- Like to use (African samples)						
Predictors	Japan			Nigeria		
	Unstandardized Coefficients		Standardized Coefficients $\beta$	Unstandardized Coefficients		Standardize d Coefficients $\beta$
	B	SE (B)		B	SE (B)	
Familiar-Not familiar	.137	.026	.163			
Traditional-Modern	-.103	.024	-.123	-.089	.015	-.111
Cute-Not Cute	.124	.029	.127	.257	.037	.243
Cool-Not Cool	.406	.036	.357	.210	.039	.192
Intuitive-Not intuitive						
Valuable-Not Valuable	.192	.041	.142	.327	.026	.300
Simple-Complex						
Indigenous-Foreign	.112	.030	.110			
(Constant)	-.077	.091		.100	.060	
R <sup>2</sup>	.334			.447		
p< .05						
C- Like to have (African samples)						
Predictors	Japan			Nigeria		
	Unstandardized Coefficients		Standardized Coefficients $\beta$	Unstandardized Coefficients		Standardize d Coefficients $\beta$
	B	SE (B)		B	SE (B)	
Familiar-Not familiar	.138	.026	.159			
Traditional-Modern	-.059	.025	-.069	-.095	.016	-.114
Cute-Not Cute	.160	.030	.160	.297	.039	.272
Cool-Not Cool	.416	.037	.355	.191	.041	.169
Intuitive-Not intuitive						
Valuable-Not Valuable	.231	.042	.166	.312	.027	.277
Simple-Complex						
Indigenous-Foreign						
(Constant)	-.685	.082		.102	.063	
R <sup>2</sup>	.335			.429		
p< .05						

From the summary of regression result presented in Table 22A-C, the Japanese evaluation response towards Japanese samples shows that the ratings of variables *cute-*

*not cute*, *cool-not cool* and *valuable-not valuable* affected mostly to predict their preference *like to look at*  $R^2=.524$ . The ratings of variables *cute-not cute*, *cool-not cool* affected mostly to predict preference *like to use* ( $R^2=.335$ ) while *valuable-not valuable*, *cute-not cute*, *cool-not cool* affected mostly to predict preference *like to have* ( $R^2=.524$ ). Meanwhile, with evaluation response from Nigerian participants, ratings of variables *valuable – not valuable*, *cool-not cool*, *cute-not cute* affected mostly to predict the preference for *like to look at*  $R^2=.557$ . The ratings of variables *valuable-not valuable*, *cute-not cute*, *cool-not cool* affected mostly to predict preference *like to use* ( $R^2=.485$ ) while the variables *valuable-not valuable*, *cool-not cool*, *cute-not cute* affected mostly to predict the preference for *like to have* ( $R^2=.474$ ). Overall, it can be observed that the ratings of the aesthetic evaluation words *cool* and *cute* appears to be consequential in evaluating the visual appeal of African and Japanese inspired objects for the preference of Japanese and Nigerian cultures.

Table 21. Summary of Regression analysis with Japanese product samples only

A- Like to look at (Japanese samples)						
Predictors	Japan			Nigeria		
	Unstandardized Coefficients		Standardized Coefficients β	Unstandardized Coefficients		Standardize d Coefficients β
	B	SE (B)		B	SE (B)	
Familiar-Not familiar						
Traditional-Modern						
Cute-Not Cute	.413	.025	.441	.255	.034	.254
Cool-Not Cool	.261	.026	.268	.264	.036	.260
Intuitive-Not intuitive						
Valuable-Not Valuable	.238	.030	.204	.317	.022	.312
Simple-Complex	.048	.024	.049	.042	.015	.047
Indigenous-Foreign	.057	.020	.070			
(Constant)	.231	.064		.293	.050	
R <sup>2</sup>	.524			.557		
p < .05						
B- Like to use (Japanese samples)						
Predictors	Japan			Nigeria		
	Unstandardized Coefficients		Standardized Coefficients β	Unstandardized Coefficients		Standardize d Coefficients β
	B	SE (B)		B	SE (B)	
Familiar-Not familiar	.137	.026	.163			
Traditional-Modern	-.103	.024	-.123	-.071	.020	-.081
Cute-Not Cute	.276	.031	.266	.279	.038	.265
Cool-Not Cool	.329	.038	.255	.227	.041	.213
Intuitive-Not intuitive						
Valuable-Not Valuable	.192	.041	.142	.305	.024	.287
Simple-Complex						
Indigenous-Foreign	.112	.030	.110	.044	.021	.048
(Constant)	-.267	.081		.187	.059	
R <sup>2</sup>	.398			.485		
p < .05						
C- Like to have (Japanese samples)						
Predictors	Japan			Nigeria		

	Unstandardized Coefficients		Standardized Coefficients $\beta$	Unstandardized Coefficients		Standardized Coefficients $\beta$
	B	SE (B)		B	SE (B)	
Familiar-Not familiar				.031	.015	.039
Traditional-Modern	-.081	.024	-.099	-.087	.022	-.095
Cute-Not Cute	.314	.032	.285	.245	.041	.223
Cool-Not Cool	.284	.034	.247	.249	.043	.225
Intuitive-Not intuitive						
Valuable-Not Valuable	.399	.039	.290	.330	.026	.298
Simple-Complex	.110	.031	.097			
Indigenous-Foreign	.082	.028	.085	.049	.022	.051
(Constant)	-.855	.082		.169	.062	
$R^2$	.443			.474		
$p < .05$						

For the third aspect of preference described by the evaluation variable *like to have*, a similar pattern to the evaluation appeared for the preference *like to use* for both nationalities in the case of African samples. The Japanese response for the preference *like to use* for African samples was mostly effected by the rating of coolness ( $R^2=.334$ ). Whereas, the Nigerian evaluation showed that the rating of ‘valuable’ and ‘cute’ effected most effectively to their preference *like to use* ( $R^2=.447$ ). However, in the evaluation response for the Japanese samples, the Japanese response for the preference *like to have* was mostly affected by rating for valuable-not valuable and then for *cute-not cute* and *cool-not cool* ( $R^2=.524$ ). Also, a similar evaluation pattern almost applies in the case of Nigerian response where their response for the preference *like to have* was mostly affected by rating for *valuable-not valuable* and then *cool-not cool* and *cute-not cute* ( $R^2=.474$ ). This raised a question of whether the participants be sharing a cross-cultural aesthetic feeling towards cross-cultural product in the preference *like to use*.

## 6.8. Summary of Findings

From the result of the PCA, two main factors were the Nigerian participants and three main factors the Japanese participants. As can be seen from the results, the Japanese participants focused on all the three dimensions while evaluating the product samples, whereas, the Nigerian participants paid attention to two factors namely - aesthetic value and identity value. Overall, the application of regression analysis based on step-wise method revealed that the preferential *like to look at* was mostly attributed to the perceived aesthetic qualities of the products – *cute* and *cool*. On the basis of cultural differences, the variables partly describing the physical aesthetic qualities – *cute* and *cool*, together with the perceived *value*, significantly predicted the pattern of preference by the Nigerian participants, including all product samples. In the case of Japanese participants,

the variables – *cute-not cute*, *cool-not cute* and *valuable-not valuable* only predicated their liking to use and to have for all product samples.

The regression analysis was applied to examine the structure of preference of the Nigerian and Japanese participants. The preference factors were taken as dependent variables while the rest of the variables as independent variable. In the case of Japanese evaluation of Japanese samples, the variables describing the emotive qualities – cute and cool. For the Nigerian response toward African samples, the emotive qualities – cool and cute – were mostly significant but together with value perception. In the case of Japanese evaluation of African samples, the emotive qualities cool became mostly significant. But for the Nigerian evaluation of Japanese samples, the value ratings were significant across the three levels of preference. Overall, the three levels of preference were mostly affected by the rating of cuteness, coolness and value perception of sample. Simplicity can also be effective to the preference *like to look at*. It was observed that people may tend to look at unfamiliar or modern object than familiar or traditional objects, though this effect of this tendency was not large.

An arising question to test the reliability of these results is whether the construction of meaning based on cultural values might have influenced the evaluation using with adjective words ‘cute’ and ‘cool’. In other words, the effectiveness of these multi-faceted words in the evaluation process could be contested since a language translation was involved in presenting the evaluation form to the Japanese participants. The straining aspect could be that cuteness is sometimes attributed to a feminine behavior while coolness may be perceived as a masculine trait. Traditionally, the aesthetic ‘cute’ (translated in Japanese as ‘kawaii’) is noted as a commonly used word among the Japanese which has an historical bearing. While empirical studies on *kawaii* are relatively recent, some researchers have begun to show its relevance in a global and modern day context (Botz-Bornstein, 2011; Nittono, 2010; Nittono, Fukushima, Yano, & Moriya, 2012; Ohkura et. al, 2011; Ohkura, et al, 2014). Contextually, the word ‘cute’ is applied here as a social construct and affective feeling now globally adopted in aesthetic appreciation towards objects attractiveness by means of smallness or prettiness. Resonating with this argument of a localized meaning of ‘kawaii’ is the concept of ‘cool’.

‘Cool’ (translated in Japanese as *kakkoi*) has been historically found to be connected to African sociocultural construct and historical evolution of African American. For instance, references have been made that describes it as a kind of behavioral attitude (meaning to remain calm and composed under a difficult condition) common to the black men during slavery trade in the United States (Botz-Bornstein, 2011). Traditionally, the African root of ‘cool’ has been traced to the moral philosophy and aesthetic attitude of the Yoruba people in the south western Nigeria called *itutu*. *Itutu*, translated as ‘mystic coolness’, is noted as an ideal of patience and self-composure (Thompson, 1973). In spite that no specific definition has been agreed on by researchers Warren & Campbell (2014), reveals key characteristics of ‘cool’: 1) ‘socially constructed’ (not an intrinsic property of an object or person but a perception or attribution by the perceiver); 2) ‘subjective and dynamic’; 3) ‘perceived to be a positive quality’ and 4) it is a trait that transcend beyond being positive or desirable. This study supposed that ‘cute’ also exhibit similar characteristics.

‘Cute’ (mostly translated in Japanese as ‘*kawaii*’) has been argued to be a cultural trait of Japan. A typical example is the Hello Kitty character created in Japan since 1974. More so in recent times, as part of Japan’s promotional strategy for culture and foreign affairs, *kawaii* is adopted and used as a national policy tool (Nittono, 2010). Etymologically, Nittono (2010) informed that *kawaii* has its cultural root meaning in the word *kawayui* popularly used around the Edo era (ca. 17-19 centuries). In turn, *Kawayui* is said to be coined from *kawa* (meaning face), *-hayu* (meaning flushing) and *-shi* (an adjectival suffix). Altogether, *kawa-hayu-shi* means ‘to feel like blushing or ashamed due to a twinge of conscience’. Following the late Edo era, the word has begun to evolve from its connotation of pity and to be used in sense of love and affection specially to describe small things which are felt to be weak and lovable. In more recent times, *kawaii* has accrued meaning also used for complimenting elderly people while used in everyday life as a word signifying aesthetic meaning of cuteness and expression of affection from superiors (e.g. adults) towards inferiors (e.g. kids).

In the light of emerging changes in social system and globalization, and cultural differences notwithstanding, the results suggest that ‘cool’ and ‘cute’ are seen as aesthetic values and stylistic qualities desired by users in cultural objects. Botz-Bornstein (2011) claimed that the concept of ‘cool’ and ‘cute’ are acting as ‘catalysts’ in a modern

word. They scarcely point back to the ethnic past neither do they often carry the notion of a gender-based behavioral tendencies especially when they are contextualized. That the Japanese ‘cool feeling’ towards African objects may indicate an expression of ‘autonomy’ described by Warren & Campbell (2014). According to Warren’s (2014) study, the self-motivation (willingness to be oneself or to do one’s own thing irrespective of the norm) is an extra quality which defines coolness. This behavioral trait tends to make people desire to be unique or not always imitate others, particularly when it is ‘contextually appropriate’. On the other hands, the Japanese ‘cute feeling’ may rather be seen as a shared expression that is a considered as normal value system that exist within the culture. In the case of the Nigerian participants’ evaluation rating, the objects’ attribution of value accompanied with feeling of coolness and cuteness demonstrates a pattern of liking attitudes that basically underlies their desire for cultural objects. While it not certain that a reflection of autonomy could be at play, the conjoint perception of coolness and cuteness could also suggest that they pay attention to the objects’ visual appearances. As can be seen in their regression Table 22, the  $R^2$  value for *like to look at* were relatively higher when compared to the  $R^2$  value for *like to use* and *like to have*.

It is clear from the outcome of this study that user-centered feeling (e.g. familiarity, preference) and object-oriented attributes (e.g. cuteness, coolness) provides explanation for cross-cultural difference in aesthetic value cognition in cultural objects. The question remains what other factors contribute to this effect and how much weight do they carry. Future study is needed to address that question.

Finally, we deduced that the concerns of consumers when perceiving products visually may differ based on cultural orientation. So, the implication is that since product design is seen as a medium of cross-cultural communication, there is a growing need to understand consumers’ way of thinking. We anticipate that this may not only have a far-reaching effect on market growth, but also can play a significant role in unveiling untapped market potentials.



Table 22. Summary of Multiple Regression Analysis results

Levels of preference	Japan participants		Nigeria participants	
	Evaluation descriptors			
	African Samples	Japanese Samples	African Samples	Japanese Samples
Like to look at	Cool	Cute	Cool	Valuable
	Cute	Cool	Valuable	Cool
	Indigenous	Valuable	Cute	Cute
	Valuable	Indigenous	Modern	Simple
	Modern	Simple	Indigenous	Simple
Adj R <sup>2</sup>	.407	.522	.547	.556
Like to use	Cool	Cute	Valuable	Valuable
	Familiar	Cool	Cute	Cute
	Valuable	Familiar	Cool	Cool
	Cute	Valuable	Modern	Modern
	Modern	Modern		Indigenous
	Indigenous	Indigenous		
Adj R <sup>2</sup>	.329	.394	.445	.483
Like to have	Cool	Valuable	Valuable	Valuable
	Valuable	Cute	Cute	Cool
	Cute	Cool	Cool	Cute
	Familiar	Modern	Modern	Modern
	Modern	Simple		Indigenous
		Indigenous	Familiar	
Adj R <sup>2</sup>	.331	.439	.427	.472

Note.  $p < .05$ ; *Adj R<sup>2</sup> value* = adjusted coefficient of determination is an estimate of the effect size [the proportion of variance in the dependent variables (levels of preference) that can be explained by the independent variables (evaluation descriptors)]; the standardized regression coefficients ( $\beta$ ) of the highlighted evaluation descriptors are greater than 0.2.

## 6.9. Concluding Remarks

In the experimental research, study has focused it lenses to investigate the cross-cultural effects on aesthetic value cognition between Japanese and Nigerian participants. From the result obtained through the cognitive style test and cross-cultural product evaluation, the following key findings, it was observed that:

- Overall, it can be deduced both Japanese and Nigerian participants both showed strong tendencies towards holistic and attribute oriented way of thinking.

- Nigerian participants showed tendencies for more positive responses in terms of aesthetic values (based on evaluation word *cute* and *cool*) and preference attitude compared to Japanese.
- The three levels of preference attitudes proposed in this study ('like to see, like to use and like to have') were correlated. However, these levels of preferential attitudes vary when subject could recognize the origin of a particular product.
- Familiarity effect mostly to differentiate between the endogenous- and exogenous- cultural product evaluation. In the category of the nationalities, the aesthetic value – cool and the preference levels (like to use and like to have) showed the largest effect as predictor. In the case of the product samples (Africa/ Japan), the sense of product origin and trendiness showed the strongest effect as predictor.
- The three levels of preference were mostly affected by the aesthetic value such as cute, cool and sense of product value.

In the final chapter, the study reflects across the previous chapters to summarily present the purpose of the study while it gathers key findings to reach a general conclusion.

## **7. GENERAL DISCUSSIONS AND CONCLUSION**

### **7.1. General Discussions**

#### **7.1.1. Summary of Research**

While previous cross-cultural *kansei* research has been limited to Asia, Europe and America, a new frontier of study involving the African cultures is proposed by this study. This dissertation has aimed to investigate and develop insight into cross-cultural effects on perceived aesthetic value of product design, using a sample range of traditional and modern oriented designs. On the basis of literature review, quantitative and qualitative studies, the implications of the cultural differences of users' aesthetic value cognition were explicated. The scope of this study has touched upon African culture in comparison with the East Asian culture, towards paving a new frontier of study over the on-going trend of cross-cultural *kansei* research. In the main study, the research lens was focused on Nigeria and Japanese, as distinct cultural entities in Africa and East Asia. To this end,

two tests were conducted to explore cross-culturally, the perceptual style (cognitive process of object categorization) and the relationship between perceived aesthetic qualities in product design and user emotive-cognitive values. These primarily include 1) Cognitive Style Test and 2) Product Evaluation Test. Each of these tests was carried out under preliminary (pilot) and main (advanced) phases. In the following section, the findings from the study are generally discussed with concluding remarks.

The main objective of the study was earlier defined as follows:

*To understand cross-cultural effects on the perceived affective value and preferential attitude evoked by visual impressions of African and Japanese designed objects through cognitive style and semantic evaluation tests.* This study aim suggests the following enquiries:

- *Are there cross-cultural effects (commonalities and dissimilarities) on the perceived product attributes, aesthetic values and preference in product visual evaluation?*
- *What are the commonalities and dissimilarities in cross-cultural evaluation of product design based on perceived product attributes, aesthetic values and preference in product visual evaluation?*

The methodological approaches employed served to answer the research questions and accomplish the three specific goals of the study:

*1. To explore links between aesthetics in the African design context and Japanese design context:*

From the case survey, African designs were mostly conceived as craft-based and culturally inspired. It was noted also that the evolution of African inspired product designs tends to contrast sharply between modern and traditional characters such as use of materials and cultural symbols. The appraisal of aesthetic value in modern African design relates mostly to attractiveness, and beauty. Apart from product cost, East Asian product design preference towards Africans was seen to be mostly compelled by design sophistication, cultural affinity and product styling. It currently appears that African designers are becoming aware about *kansei* design.

Overall, it appears that diverse cognitive style tendencies might exist among the African and East Asian cultures. In preliminary cognitive style test, the African participants showed more inclination towards an analytic- and attribute-oriented thought compared to the Japanese participants.

## ***2. To understand through visual stimulation, cross-cultural variations of perceived aesthetic value and sensibility towards African and Japanese designed objects:***

Overall, there were indications for cultural proximity (points of convergence) and distance (points of divergence) between African and East Asian cultures. In preliminary product evaluation test, both African and East Asian participants' perception of African product samples based on three categories of product trendiness - traditional, semi-modern and modern were consistent. In the visual evaluation of these samples, the objects that were perceived to be culturally familiar by African participants, the East Asian participants tended to attribute high value. This included objects grouped within the traditional and semi-modern categories. Meanwhile, the objects under the modern category were perceived to have high value for the Africans while the East Asians rated them low. The result suggests that the familiarity of objects with different cultures could play an influential role in the evaluation of designed objects.

Findings from the main test revealed that the perception of familiarity increases in the case of endogenous cultural evaluation and decreases with exogenous cultural products. Three main factors were extracted and identified as product aesthetic value, identity value and simplicity. The Japanese participants focused on all the three dimensions while evaluating the product samples, whereas, the Nigerian participants paid attention to two factors namely - aesthetic value and identity value. The evaluation factor based on 'cute' and 'cool' showed a high consistency of relevance in the appreciation of product aesthetic values between the Japanese and Nigerian cultures. However, different tendencies of cultural perception were observed in the appraisal of physical attraction which significantly affected to preferential attitude (based on *like to look at*, *like to use* and *like to have*). The attitude of liking to look (physical attraction), liking to use (functional attraction) and liking to have (acquisitive attraction) adopted in the study may be considered as a new approach to understand the nature of user's preference in future *kansei* research.

1. **The identification of aesthetic tradition in African design, mostly relating to attractiveness (beauty) and craftsmanship of products appears to be relevant to study *kansei* study in a cross-cultural context.**
2. **Overall, it appears that a diverse cognitive style tendency might exist among the African and East Asian cultures.** Following the finding from the cognitive style test conducted as the preliminary stage of the study, The Japanese participants tend to show more tendencies for holistic way of thinking than the African participants. Nevertheless, there was not enough evidence to establish the test assumption.
3. **Overall, there were indications for cultural proximity (points of convergence) and distance (points of divergence) between African and East Asian cultures.**

The perception of familiarity increases in the case of endogenous cultural evaluation and decreases with exogenous cultural products. The effect of familiarity on product aesthetic evaluation and preference can be moderated by product perception based on cultural origin or ethnocentric factors. From the factorization of evaluation variables, the Japanese showed more complex perceptual (cognitive) structure than the Nigerians. The evaluation factors based on *cute* and *cool* were pertinent to the judgment of aesthetic of products for both Japanese and Nigerian participants. However, the Nigerians tend to show higher rating for *value* together with their evaluation for *coolness* and *cuteness*. The attitudes of preference for objects can be differentiated by the evaluation factors *like to look at*, *like to use* and *like to have*.

#### **7.1.2. Limitations of the Study**

This study has taken an exploratory approach towards understanding the point of similarities and differences in the perception of aesthetic values in product design focusing on Japanese and African cultures. However, the limitation of the study remains in that the findings can only be generalized for the product samples selected and represented as African and Japanese product samples and the conditions under which the evaluation were carried out. In consequence, the result may not be extended over a wide range of culture and product design until further evidence is gathered. Also, geographical distance between the research target areas has posed a challenge of increased cost and another form of variability, particularly in the dimension of physical space or use of real product for the empirical study. Considering this particular situation, the results of

participants' mood evaluation which was done with SAM in the course of the product evaluation tests, was not reported.

In general, the study results are specific to the socio-cultural characteristics of the selected cultural groups and may not be applicable to other groups. Despite the limitations of the study, the obtained result is noteworthy to explain the cross-cultural effects on perception and sensibility towards aesthetic value in cultural objects based on a visual evaluation process.

## **7.2. General Conclusion**

### **7.2.1. Summary**

While there is a growing trend in *kansei* research over cultural diversity, no study has considered African cultures in cross-cultural comparison. This research contributes towards widening the understanding of human *kansei* by revealing aesthetics as a *kansei* element in cultural product designs and differentiating factors in the perceived value in objects. It can be therefore deduced from the study that there appears to be cultural tendencies moderating the perception of aesthetic value and preferential attitude based on a test process using visio-semantic evaluation of handcrafted and machine-made product designs. In particular, it can be seen in the case of comparison between African and East Asian cultures that dissimilar and similar perceptual and cognitive processes can exist among regional cultural groups, which might have influenced the appraisal of aesthetic qualities and preferential attitude towards product designs within same or across culture. The study suggests that familiarity of objects could a contributory role in assigning product value depending on cultures. In the case of Nigerian participants, products tend to be valued more when they bore modern 'look' and foreign origin. However, the Japanese participants attributed more value for familiar products or unfamiliar products with traditional 'look'. The study suggests that there could be a linear relationship between aesthetic qualities in familiar products and user's preference. In spite of current results, it remains to be seen whether the research findings will reflect perceptual tendencies of other cultural groups within same country or the nationalities representing Africa and East Asia cultures.

### 7.2.2. Implications of the Study

Crilly, Moultrie & Clarkson (2004) have argued that initial perception of product design is a crucial stage in the process of design communication that affects cognitive, affective and behavioral responses to a product, which in turn will stimulate to the interest of users towards such product. The understanding of users' aesthetic values over cultural diversity can be explored as a key factor in recognizing new gaps for designing products that transcend cross-cultural borders. Towards fostering creative economy in a global market, it is imperative for designers to gain a deeper understanding of users' culture and find ways to use culture as a potential resource in product development and innovation. Hence, design outputs can be improved to harmoniously embody both tangible and intangible qualities that result into more beneficial user - artefact relationship. While the richness of cultural values can be used as a tool to inspire design for meaningful product experience, understanding the mechanism of perception with traditional and modern products will provide new insights into expressing aesthetic value in product design and a drive towards seamless integration of users' in-depth psycho-physiological needs. This study has attempted to reveal cultural effect through semantic and emotional expressions toward the products are exuded by the product aesthetic qualities which are perceived based on the user's aesthetics and moderated by other factors including culture and context. Since product designs are seen as a tool of cross-cultural understanding, the growing need for cross-cultural understanding of the users' behavior will not only have a far-reaching effect for the global market, but also will play an important role in engendering untapped potentials in local designs for a global market. It is anticipated that this knowledge can foster an innovative *kansei* study approach to design over cultural diversity. Essentially this study hopes to contribute towards:

- Expanding the frontier of *kansei* research to include unexplored area such as Africa.
- Helping product designers/ makers understand better the people they design for. In turn, they can increase the chances for product success and users' satisfaction.
- Providing insight to understand the aesthetic feeling of kawaii or cuteness in Japanese and Nigerian contexts. This information could serve to develop original designs reflecting cultural characteristics of target users.

### **7.2.3. Future Considerations**

The study considers that the experience of product representations by images might differ from the experience based on physical or hand-on interaction. Product craftsmanship and usability are factors that were not explored in the study. An in-depth exploration can be made on these factors to combine the insights to the ones derived from this study which could provide a comprehensive guide that can be used by designers to design specifically for target users and elicit desired values fit for the users.

Further consideration for future study will re-consider the constraints posed by the means and tools available for the research. Also, it is proposed that this study, in the future, be extended to include other cultures in order to increase to a high level, the reliability of prediction for different cultural groups in the habit of perception with cross-cultural products and sensibility to implicit values in product designs. The adoption of advanced biometric measurement can be applied to gain deeper insight into the pattern of response in a non-verbal way.



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## APPENDIX

### A. Scholarly Definitions on *Kansei*

There are several definitions on *kansei* which has been proposed through previous studies. Some key definitions are described as follows.

*Kansei* is a comprehensive space for human sensory, cognitive and emotional functions. Mitsuo Nagamachi, founder of the concept of *kansei* engineering defines *kansei* as “a mental state where knowledge, emotion and sentiment are harmonized” (Schütte, 2002; Lokman, 2010). Otherwise it has been described as the mental functioning and more precisely as being a higher function of the brain. With much emphases on its subjective nature, Ozaki and Iwamoto (2006) posit that *kansei* is individual and it's often relates to experience. Particularly, they define *kansei* as ‘an ability of the human mind to determine how one feels in a particular situation’, as a result of a ‘highly advanced function of the human brain’.

Harada (1998) gathered some definitions of *kansei* through a questionnaire administrated to researchers at University of Tsukuba. The collected definitions posited *kansei* as the following: subjective and unexplainable function; innate nature and cognitive expression of knowledge and experience; Interaction of intuition and intellectual activities; evaluation ability reacting symbolically and intuitively, and mental function creating images. According to this investigation, researchers included not only intuitive thoughts, but also *rational thoughts (cognitive expression of knowledge and intellectual activities)* in the *kansei* definition. Harada (1999) submits that *kansei* is a terminology which unifies concepts such as sensitivity, science, sensibility, feeling, aesthetics, emotion, affection and intuition.

S.H.Lee et al. (2002) did an etymological mapping of *kansei* root words expressed in Chinese characters (Figure 12). They describe its meaning using two key concepts - *kansei* and *Chisei*, holding the view that both represent mental functions activated when receive information from the external world. S.H.Lee (1999; 2000), in her *kansei* design research exploration using 3D images found that *Kansei* works to increase the creativity through images with feelings or emotions (S.H.Lee et al., 2000) while *Chisei* works to

increase the knowledge and understanding that is matured by verbal descriptions of logical facts.

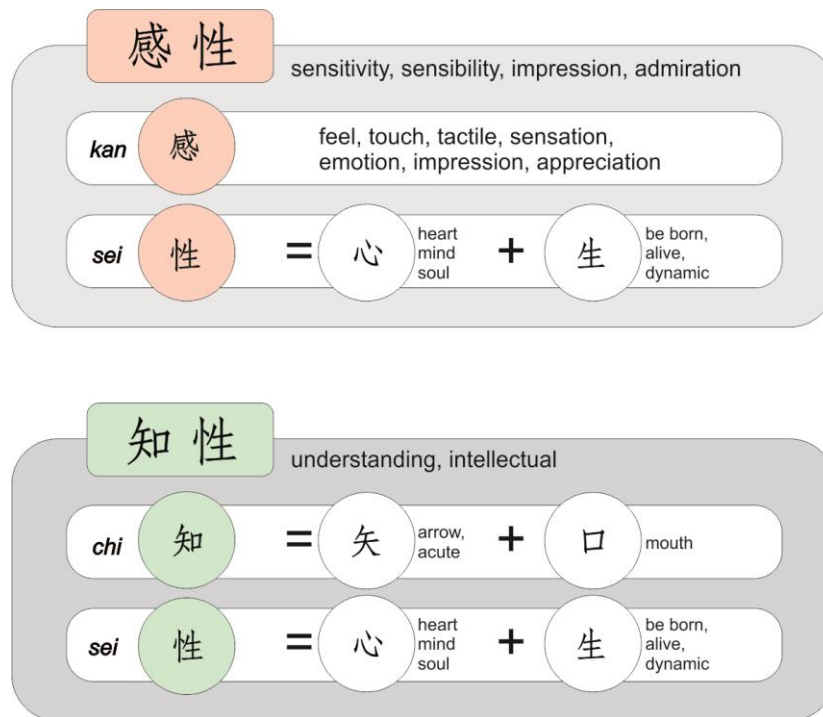


Plate 1 *Kansei* and *Chisei* description (S.H.Lee et al., 2002)

Yamanaka et al. (2011) further expatiate using the linguistic concept of *Kansei* (translated *Sinnlichkeit* in German) and *Gosei* (translated *Verstand* in German), both corresponding with the meaning "situation of astonishment + mind and mind + life" and "components of mind + five + description and mind + life" (Figure 13).

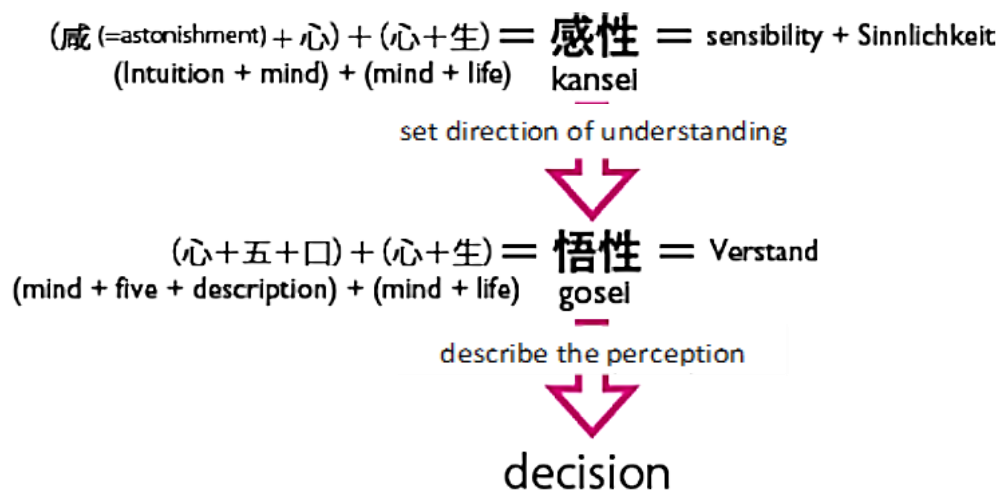


Plate 2. Component meaning of *Kansei* and *Gosei* (Yamanaka, Kasai, & Ida, 2011)

Furthermore, they also describe *kansei* with the English term *sensibility* (based on the work of Akane Nishi in 1857) and the German term *Sinnlichkeit* (which is a re-applied translation by Japanese Philosopher T. Amano in 1935). They suggest *kansei* to be ‘the sensing ability = sensibility’ coupled with ‘the process of understanding = *Sinnlichkeit*’.

A definitive elaboration made in regard to the "elements" of *kansei* might also serve to provide further insight into this concept. According to Levy and Yamanaka (2009), human *kansei* space involves:

- *Kansei process* - related to mental functions such as emotions, sensitivity, feelings, experience and intuition;
- *Kansei means* - including all the human senses and related internal factors; and
- *Kansei result* - as the output of *kansei* process which provides a unified perception for qualitative meaning and value of one's direct environment. In other words, how one perceives qualitatively one's direct environment as a synthesis of sensory qualities.

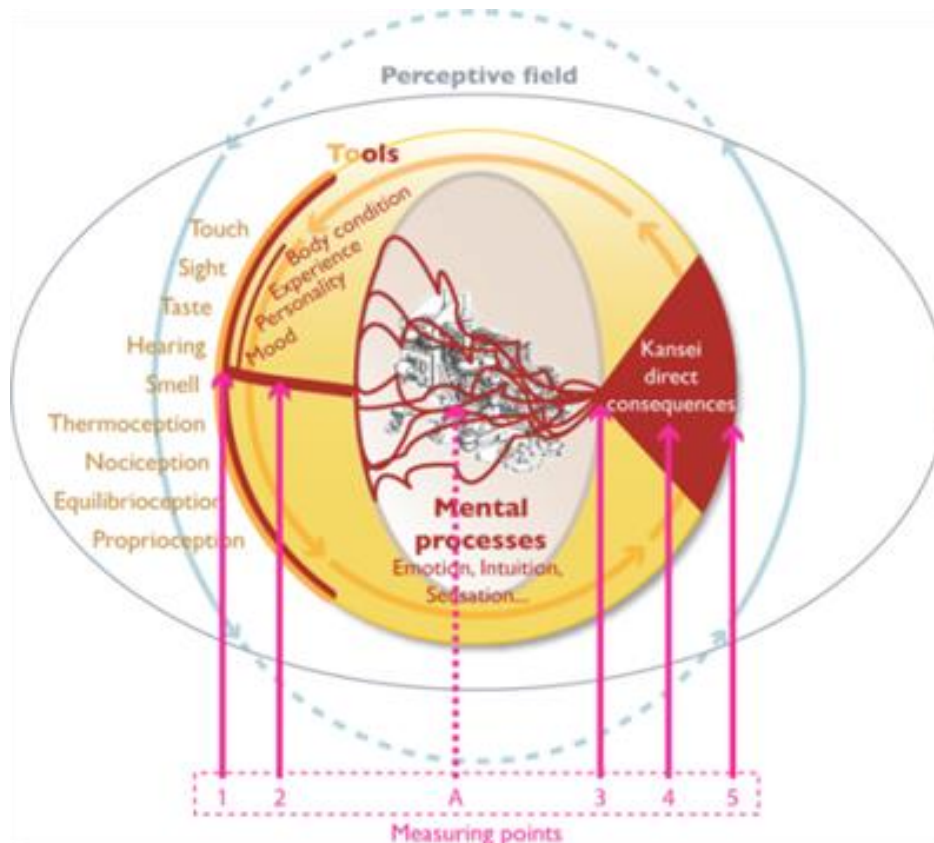


Plate 3. An illustration on *kansei* components by Lévy and Yamanaka (2009)

## B. Profiles of Japanese Inspired Product Samples


Sampled Products with Japanese Cultural Inspiration (Images)		
Product Image	Product Identity	Functional Description
<b>1</b> 	Product name: Thin Black Lines Chair Designer/ Maker: Oki Sato/ Nendo Creative origin: Japan First Year of Production: 2010	Generic function: Chair Product design category: Furniture design
<b>2</b> 	Product name: The G-Type Soy Sauce Bottle Designer/ Maker: Masahiro Mori/ Hukasan Porcelain, Ltd. Creative origin: Japan First Year of Production: 1958	Generic function: Container Product design category: Tableware design
<b>3</b> 	Product name: The Butterfly Stool Designer/ Maker: Sori Yanagi/ Tendo Company Co., Ltd. Creative origin: Japan First Year of Production: 1956	Generic product class: Furniture Product design category: Furniture design
<b>4</b> 	Product name: IH Rice Cooker "Zutto" Designer/ Maker: Fumie Shibata/ Zojirushi Corporation; Design Studio S Creative origin: Japan First year of production: 2004	Generic function: Cooker Product design category: Kitchens
<b>5</b> 	Product name: Nanbu Cast-iron ware "Maru" Designer/Maker: Hisao Iwashimizu Creative origin: Japan First Year of Production: 2000	Generic function: Container Product design category: Kitchens
<b>6</b> 	Product name: Tsubaki Shampoo Bottle Designer/ Maker: Takuya Onuki Creative origin: Japan First Year of Production: 2006	Generic function: Container Product design category: Fashion, lifestyle and accessories
<b>7</b> 	Product name: 15.0% Designer/ Maker: Naoki Terada/ Teradadesign Architects. Creative origin: Japan First Year of Production: 2011	Generic function: Cutlery Product design category: Tableware

Plate 4a. Typology of Japanese product samples

8		Product name: Fujimaruisu Designer/Maker: Y.M.K Creative origin: Japan First Year of Production: 1960	Generic function: Chair Product design category: Furniture
9		Product name: One Piece Slippers Designer/Maker: Naoko Hirota/ NAOCA. Creative origin: Japan First Year of Production: 2004	Generic function: Footware Product design category: Fashion, lifestyle and accessories
10		Product name: Ebisubento Designer/Maker: Tatsuo Tokimatsu Creative origin: Japan First Year of Production: 2008	Generic function: Container Product design category: Kitchens
11		Product name: Trash pot Designer/Maker: Drill Design Creative origin: Japan First Year of Production: 2004	Generic function: Container Product design category: Interior/ Houseware
12		Product name: Roll Designer/Maker: Oki Sato/ Nendo. Creative origin: Japan First Year of Production: 2010	Generic function: Container Product design category: Interior/ Houseware
13		Product name: (Shiraki Tsukushi Bento) "Megawappa" Designer/Maker: Yoshimasa Shibata / Yoshinobu Shibata Enterprises Ltd. Creative origin: Japan First Year of Production: 1958	Generic function: Container Product category: Kitchens
14		Product name: Infobar Designer/Maker: Naoto Fukasawa/ KDDI. Creative origin: Japan First Year of Production: 2011	Generic function: Communication device Product design category: Communication and Information Technology

Plate 4b. Typology of Japanese product samples (cntd.)



15		Product name: Bamboo bag Designer/Maker: Kazuyuki Kubo Creative origin: Japan First Year of Production: 2003	Generic function: Container Product design category: Fashion, lifestyle and accessories
16		Product name: Kikkoman Soy Sauce Dispenser 150ml bottle Designer/Maker: Kenji Ekuan / Kikkoman Corporation Creative origin: Japan First Year of Production: 1961	Generic function: Container Product design category: Kitchens/ Tableware Materials:
17		Product name: Urushi Poketto Designer/Maker: Mayumi Ikuta Creative origin: Japan First Year of Production: 2006	Generic function: Container Product design category: Fashion, lifestyle and accessories

#### Indicators for Pre-Categorization of Japanese Product Samples

-  -Traditional (6)
-  -Semi-Modern (6)
-  -Modern (5)

#### Book References for Japanese Product Sampling (Cover Pages)



Plate 4c. Typology of Japanese product samples with book references

## C. Profiles of African Inspired Product Samples

Sampled Products with African Cultural Inspiration (Images)

Product Image	Product Identity	Functional Description
<b>1</b> 	Product name: Zulu Mama Chair Designer/ Maker/ Place: Haldane Martin/ Haldane Martin CC Creative origin: South Africa First Year of Production: 2004	Generic function: Chair Product design category: Furniture design
<b>2</b> 	Product name: Ladi Kwali Tankard II Designer/ Maker/ Place: Ladi Kwali/ Ladi Kwali Pottery Center Creative origin: Nigeria First Year of Production: 1950s	Generic function: Container Product design category: Tableware design
<b>3</b> 	Product name: African Armchair Designer/ Maker: Blugirlart Creative origin: Africa First Year of Production: n/a	Generic function: Chair Product design category: Furniture design
<b>4</b> 	Product name: Premier Cobb Cooker Designer/ Maker/ Place of origin: Michel Hall Business/ Cobb International (Pty) Ltd/ Creative origin: South Africa First year of production: 2004	Generic function: Cooker Product design category: Kitchens
<b>5</b> 	Product name: Three-legged "Potjie" pot Designer/ Maker/ Place: Local artisans Creative origin: Africa Dated: n/a	Generic function: Pot Product design category: Kitchens
<b>6</b> 	Product name: L'Occitane Hand Cream Bottle Designer/ Maker/ Place: Olivier Baussan Business Creative origin: Africa First Year of Production: 2006	Generic function: Container Product design category: Fashion, lifestyle and accessories
<b>7</b> 	Product name: Kiddo Safety Finger Toothbrush Designer/ Maker/ Place: Dr MJ Scheepers and Kitemark Product Design Creative origin: South Africa First Year of Production: 2008	Generic function: Cutlery Product design category: Modern


Plate 5a. Typology of African product samples



8		<p>Product name: Slip-on Footwear  Designer/ Maker: n/a  Creative origin: Ghana  First Year of Production: n/a</p>	<p>Generic function: Footwear  Product design category: Fashion, lifestyle and accessories</p>
9		<p>Product name: African Kasese Chair  Designer/Maker: Local artisan  Creative origin: Uganda  First Year of Production: n/a</p>	<p>Generic function: Chair  Product design category: Furniture</p>
10		<p>Product name: African Colors Footwear  Designer /Maker: Caroline Slattland Solheim/ Sole Rebels Footwear/  Creative origin: Ethiopia  First Year of Production: Unknown</p>	<p>Generic function: Footwear  Product design category: Fashion, lifestyle and accessories</p>
11		<p>Product name: Naija Cooking Sauce Bottle  Designer/ Maker: Naija  Creative origin: Nigeria  First Year of Production: 2004</p>	<p>Generic function: Container  Product design category: Kitchens</p>
12		<p>Product name: Handbag  Designer/Maker: n/a  Creative origin: Africa  First Year of Production: 2010</p>	<p>Generic function: Container  Product design category: Fashion, lifestyle and accessories</p>
13		<p>Product name: Aqua Roller  Designer/Maker/Origin: Pettie Petzer &amp; Johan Jonker/ Invubu Projects/  Creative origin: South-Africa  First Year of Production: 1993</p>	<p>Generic function: Container  Product category: Kitchens</p>
14		<p>Product name: Lidded basket (beauty Nxgongo)  Designer/Maker: Zulu craftsmen  Creative origin: South Africa  Dated: 1990s</p>	<p>Generic function: Storage container  Product design category: Interior</p>

Plate 5b. Typology of African product samples (cntd.)


15



Product name: VMK Elikia  
 Designer/Maker: Vérone Mankou/ VMK/  
 Creative origin: Congo  
 First Year of Production: 2012

Generic function: Communication device  
 Product design category:  
 Communication/ Information Technology

16



Product name: Gourd Basket  
 Designer/Maker: Yoruba craftsmen  
 Creative origin: Nigeria  
 Dated: 1973  
 Archive: In collection of National  
 Museum of African Art  
<http://africa.si.edu/collections/view/object>

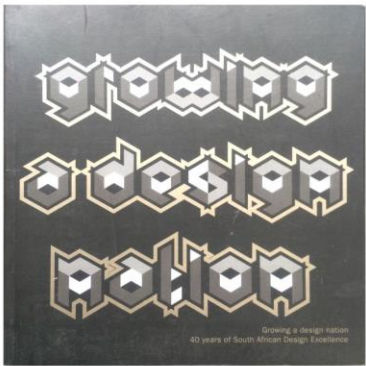
Generic function: Container  
 Product design category: Storage

### Indicators for Pre-Categorization of African Product Samples

- Traditional (5)\***
- Semi-Modern (6)\***
- Modern (5)**
- SABS Award-winning products**

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### Book Reference for African Product Sampling (Modern pre-category)



\*Note: Product samples under the Traditional and Semi-modern pre-categories were obtained through internet archives

Plate 5c. Typology of African product samples with book reference

## D. Preliminary Selections for Japanese Product Samples



Plate 6a. Sorted items from preliminary selections for Japanese modern product category

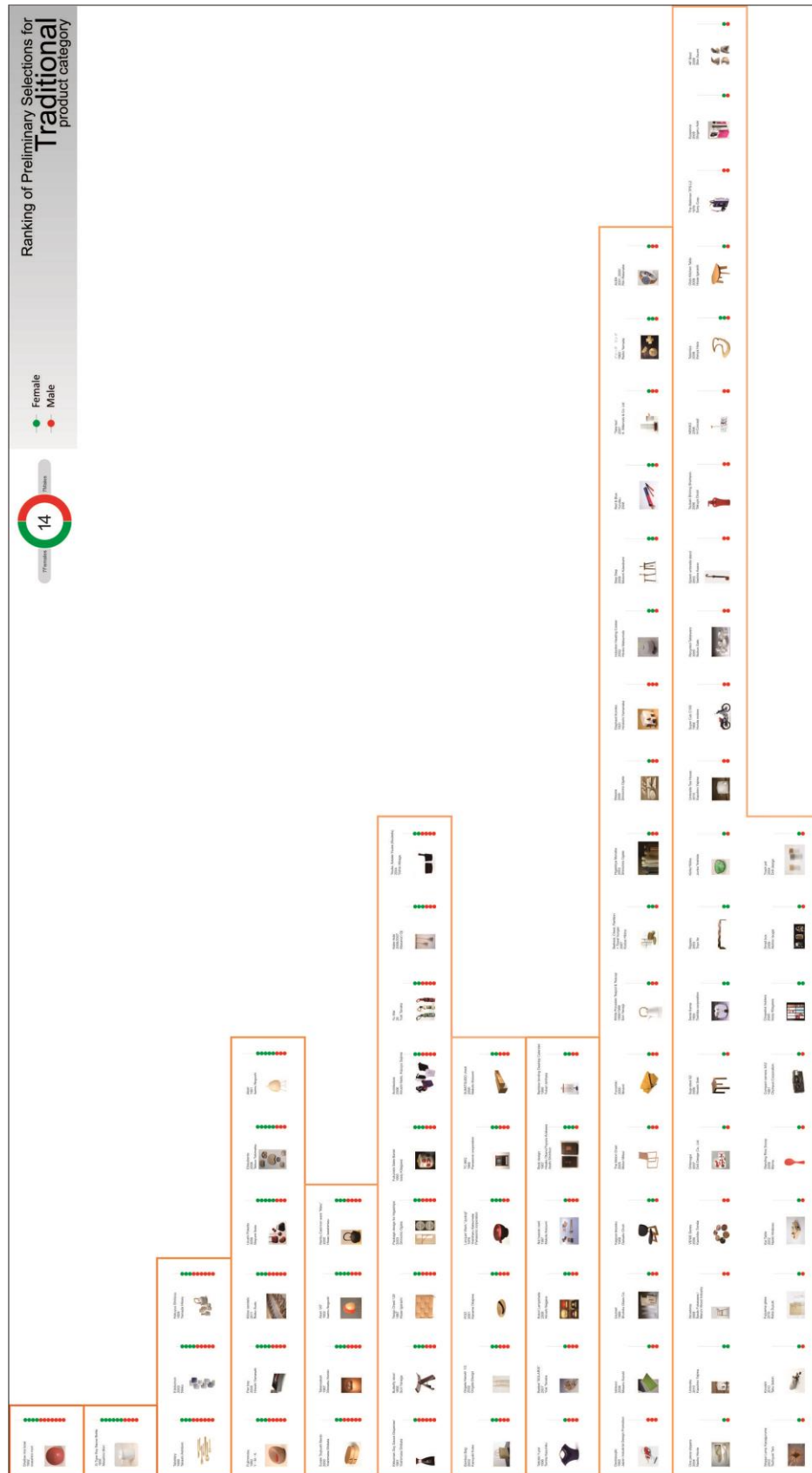


Plate 6b. Sorted items from preliminary selections for Japanese traditional product category

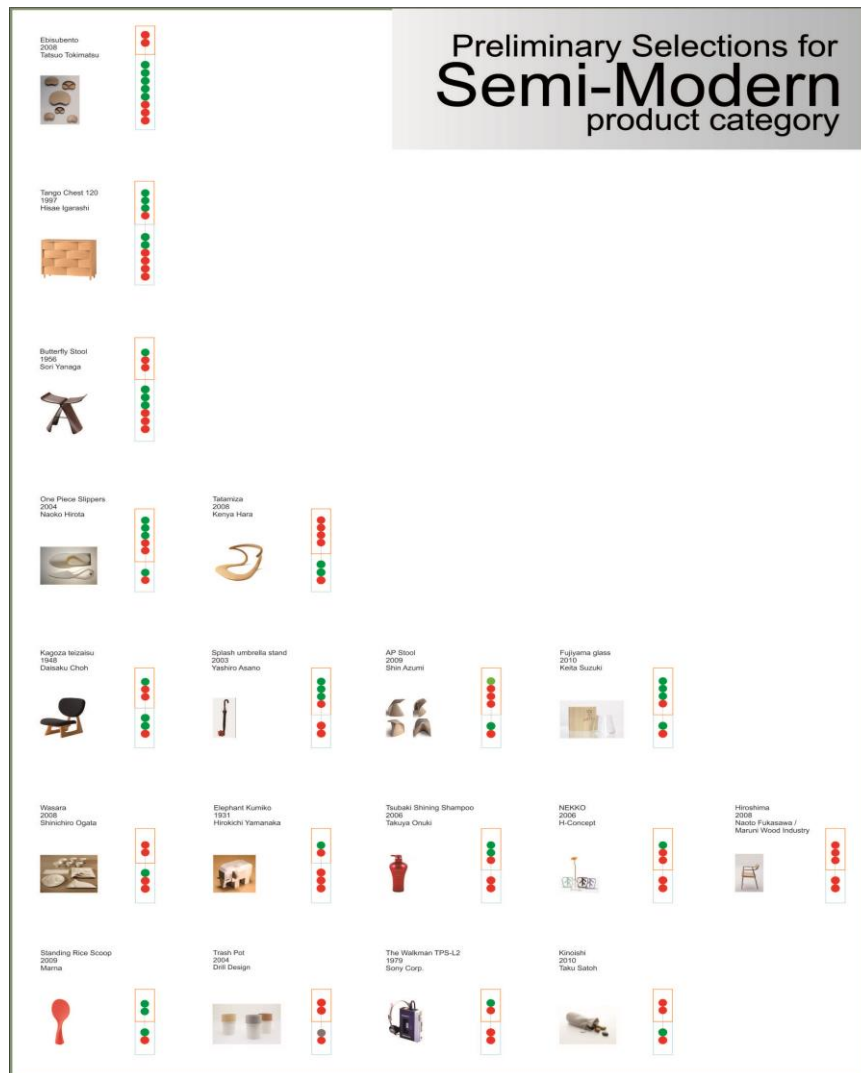


Plate 6c. Sorted items from preliminary selections for Japanese semi-modern product category



Plate 7. Japanese product samples pre-selection by Japanese students from the department of Product Design, University of Tsukuba ( $n=14$ , female=50%)

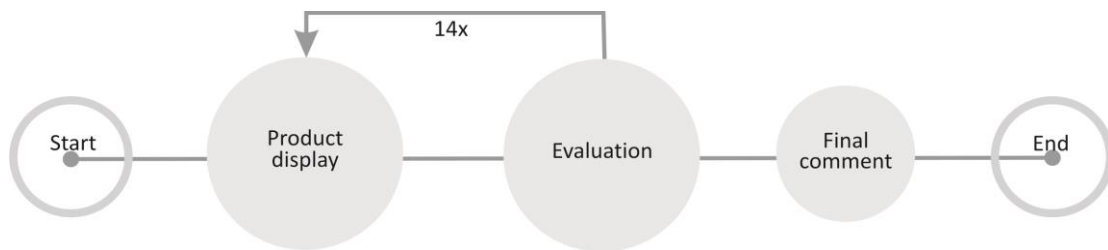
*Note: The colored dots indicate the rate of selection per product sample*

## E. Product Evaluation Test I

### Test Information (In English)

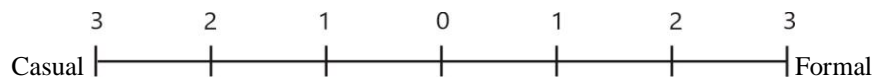
#### Introduction

This study has been purposefully designed to evaluate visual perception of some selected traditional and modern product designs. The whole experimental procedure, which lasts for about 30mins, simply involves easy-to-do evaluation tasks and open-ended comments.



Consecutively, you will be presented with the image of some selected products. For one product at a time, rate your impression (how the product looks to you) using the set of polarized words as will be exemplified below.

#### Sample charts for evaluation



To begin with, indicate how you're feeling at this particular moment by filling out the scale below:

Unhappy									Happy
Calm									Excited
Dependent									Independent

## Background information

1. Gender: ..... 2. Nationality .....
- 1 Age range: 18-23 ☐ 24-30 ☐ 30-36 ☐ Over 37 ☐
- 2 Field of specialization:  
.....
- 3 Other countries you lived in beyond 1 year (if applicable): .....  
.....

## Final Comments

1. How do you recognize product designs made from your country?
2. What are the qualities you can use to differentiate your country's traditional and modern product design?
3. What value or quality do you see in foreign product designs that are lacking in the product made in your country and vice versa? Why will you prefer a foreign design over Japanese design even when they offer the equal functional quality?

## Researcher's Information

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With the approval of the Research Ethics Committee of the Graduate School of Comprehensive Human Sciences, University of Tsukuba, this study will be carried out with all possible care without any disadvantage to the subject. If you have any opinions and questions upon cooperation in research, please freely contact the researcher.

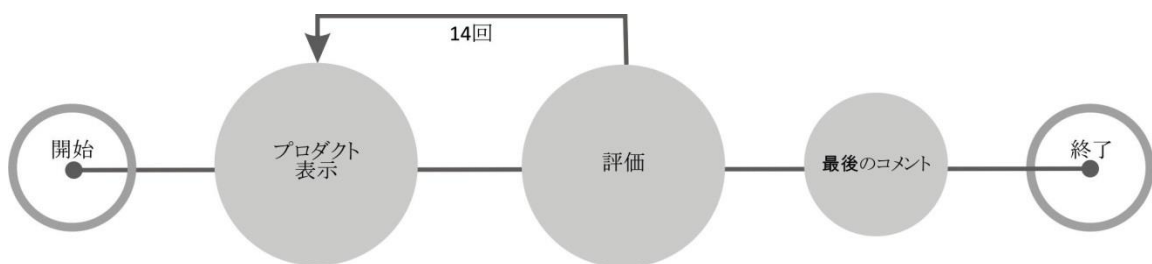
Alternatively, please contact Fine Arts Research Ethics Committee.  
[Phone: 029 -853 -2571 (Physical Art Education Research Support Office)]  
【e-mail : [hitorinri@un.tsukuba.ac.jp](mailto:hitorinri@un.tsukuba.ac.jp)】



## Test Information (In Japanese)

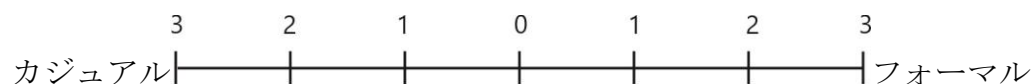
### 自己評価の手順（説明）

この研究の調査では、日本人の方に協力をお願いしております。実験では、異文化のプロダクトデザインに対する自分の感性、感覚また知覚について評価していただきます。この実験は簡単な手続きによって行われ、20 分程度で終了します。



このアンケートでは、いくつかのプロダクトの写真が提示されます。それぞれのプロダクトについて、このプロダクトはどう見えるかを自分の判断/印象で回答していただきます。

### 例



その時の、あなたの気持ちに最もあてはまるものを選んでマークしてください

不幸せ									幸せ
穏やか									興奮する
依存している									独立している



## 個人情報

4 性別: .....

5 年齢: 18-23 ☐ 24-29 ☐ 30-35 ☐ 35 歳以上 ☐

6 専攻分野: .....

7 外国で一年間以上滞在したことがありますか？もしあるとしたら、その国の名前をお書きください: .....

## コメント

ここでは実験に対するコメントを記入していただきます。以下の三つの質問に対して、自由に意見を述べてください。

口頭で述べても、紙に書いても、どちらでも大丈夫ですが、口頭の場合は、録音をさせていただきます。

1. どのようにして、自分の国のプロダクトデザインだとわかりましたか？
2. 自分の国の伝統的なデザインと現代的なデザインを区別する際、  
どういった基準や特徴に従いますか？
3. 外国のプロダクトデザインにあって、自分の国のプロダクトデザインにない価値や質（クオリティ）は何だと思いますか？また、自分の国のプロダクトデザインにあって、外国にないものはなんですか？ 同じ機能を持っているプロダクトを選ぶ時、外国の製品を選んだ場合、その理由はありますか？また、逆の場合はなぜですか？

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この研究は筑波大学芸術系研究倫理委員会の承認を得て、被験者の皆様に不利益がないよう万全の注意を払って行われています。研究への協力に際してご意見ご質問などございましたら、気軽に研究実施者にお尋ね下さい。あるいは、芸術系研究倫理委員会までご相談下さい。

【電話：029-853-2571（体育芸術エリア支援室研究支援） e-mail :

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## Semantic Evaluation Scale for Test I (in English, Japanese and Korean translations)

← Extremely		Neutral				→ Extremely	
3	2	1	0	1	2	3	
Modern						Traditional	
Beautiful						Not beautiful	
Cute						Not Cute	
Fun to use						Not fun to use	
Dynamic						Static	
Innovative						Not innovative	
Intuitive						Not intuitive	
Valuable						Not Valuable	
Befitting						Doesn't befits	
Unique						Common	
Cool						Not cool	
Desirable						Undesirable	
The product design looks familiar							
Extremely						Not at all	
The design looks like its made in my country							
Extremely						Not at all	
Have you own or used this product before? Yes <input type="checkbox"/> No <input type="checkbox"/> Can't say <input type="checkbox"/>							

Evaluation scale in English

← とても		どちらでもない				→ とても	
3	2	1	0	1	2	3	
現代的						伝統的	
美しい						美しくない	
可愛らしい						可愛らしくない	
楽しく使えそう						楽しく使えなさそう	
動的						静的	
革新的						保守的	
直感的						論理的	
価値がある						価値がない	
相応しい						相応しくない	
独自性のある						よくある	
格好いい						格好よくない	
欲しい						ほしくない	
このプロダクトをよく知っていますか?							
とても当てはまる						まったく当てはまらない	
このプロダクトは日本のに見えますか?							
とても当てはまる						まったく当てはまらない	
このプロダクトを持っていたこと・使ったことがありますか? はい <input type="checkbox"/> いいえ <input type="checkbox"/> どちらともいえない <input type="checkbox"/>							

← 매우		어느 쪽도 아닌				→ 매우	
3	2	1	0	1	2	3	
현대적						전통적	
아름답다						아름답지 않다	
귀엽다						귀엽지 않다	
사용하기 즐겁다						사용하기 즐겁지 않다	
역동적이다						역동적이지 않다	
혁신적이다						혁신적이지 않다	
직관적이다						직관적이지 않다	
가치가 있다						가치가 없다	
알맞다						알맞지 않다	
평범하다						독특하다	
멋진						멋있지 않다	
호감적이다						호감적이지 않다	
제품의 디자인이 익숙해 보인다							
매우 그렇다						전혀 그렇지 않다	
제품의 디자인이 한국적으로 보인다							
매우 그렇다						전혀 그렇지 않다	
이 제품을 가지고 있던 것·사용한 적이 있습니까? 예 <input type="checkbox"/> 아니오 <input type="checkbox"/> 어느 쪽이라고도 말할 수 없다 <input type="checkbox"/>							

Evaluation scale in Japanese and Korean translations

Note: The adjective pairs unique – common and cool – not cool were not included in the evaluation scale items during the actual test conducted with African and East Asian participants.

## F. Product Evaluation Test II

### Test Information (English)

	Pre-Evaluation
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A

#### Background Information

Please read the information below:

This is an experimental survey on a research titled "Understanding Perceptual Values in Traditional and Modern Designs: Kansei Study through Cross-cultural Approach". It involves a cross-cultural evaluation of culture-inspired product design.

It is important you understand that this is a voluntary agreement for participation, and that you can withdraw your consent to participate in this experimental survey without any disadvantage to the ongoing experiment.

The preliminary part will take about 5mins to complete.

Your response will be exclusively used for the purpose of the research and all personal information will be confidentially handled. Thank you for your cooperation.

- Major Supervisor: Yamanaka Toshimasa  
Institute of Art and Design University of Tsukuba  
【Phone : 029-853-2702 (Yamanaka Laboratory)】  
【e-mail : tyam[at]geijutsu.tsukuba.ac.jp】
- Researcher: Adelabu Oluwafemi Samuel  
Graduate School of Comprehensive Humans Sciences,  
University of Tsukuba.  
【Phone : +8180-4616-6745 (Mobile)】

Do you agree to the purpose of this experiment?

Yes ☐

No ☐

#### Basic Information

Gender:

Female ☐

Male ☐

Age range:

18-23 ☐

24-27 ☐

28-33 ☐

34-37 ☐

38歳以上 ☐

Nationality:

Ethnic:

Religion:

Main Field of Study:

Area of Specialization:

Years of professional experience:

Places you've stayed for more than 1year outside your country:



# Main Evaluation

B

## Background Information

Hence, you will be presented with 33 images of product samples for your evaluation. To each of the product is provided 11 bi-polar words in a rating scale ranging from 4-3-2-1-0-1-2-3-4 respectively. Please mark the box that you think is most suitable to describe each of the product shown.

Example:



This part will take about 25mins to complete. Your response will be exclusively used for the purpose of the research and all personal information will be confidentially handled. Thank you for your cooperation.

## START

Please express how you're feeling at this particular moment by filling out both scales below:

	Not at all	-	Slightly	-	Moderately	-	Very	-	Extremely
Happy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Excited	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Confident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Independent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Indomitable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## Test Information (Japanese)

# 予備調査－認識評価

A

### 説明

以下の情報を読んでください。

私は、「伝統的と現代的なデザインにおける知覚的な価値への理解：比較文化のアプローチを通ず感性の研究」というテーマの研究をしており、このアンケートはその一環です。

この予備的部分について、回答には約5分ほどかかります。

また、このアンケートの回答は研究以外には使用しません。実験結果が出版される場合、個人情報は排除して公開します。

実験に協力して頂きありがとうございます御座います。

■ 研究責任者：筑波大学芸術系 山中敏正

【電話：029-853-2702（山中研究室）】

【e-mail：tyam@geijutsu.tsukuba.ac.jp】

■ 研究分担者：筑波大学大学院人間総合科学研究科  
アデラブオールワフェミサミュエル

【電話：080-4616-6745（携帯電話）】

【e-mail：femmylab@kansei.tsukuba.ac.jp】

この実験への参加に同意しますか？

はい ☐

いいえ ☐

□□□□

性別:

☐ ☐  
☐ ☐

年齢

18-23 ☐  
24-27 ☐  
28-33 ☐  
34-37 ☐  
38歳以上 ☐

国籍:

専攻分野:

専門分野:

専門の経験年数:

一年以上滞在した国名:



# 製品評価

B

## 説明

これから、33プロダクトの写真が提示されます。  
それぞれの写真を見て、最もあてはまると思う項目に印をつけて下さい。  
項目は1つのプロダクトに対して11用意されており(よく知られている・見知らぬ、  
伝統的な・現代的な、など)、それぞれの評価対には 4-3-2-1-0-1-2-3-4 の段階があります。

例



回答には約25分ほどかかります。  
また、このアンケートの回答は研究以外には使用しません。実験結果が出版される場合、  
個人情報排除して公開します。

## 始め

あなたのいまの気分を、以下の両スケールに印をつけて下さい。

	全くあてはまらない	ややあてはまらない	どちらでもない	ややあてはまる	とてもよくあてはまる
幸せ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
興奮している	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
自信がある	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
独立している	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
不屈の	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## Semantic Evaluation Scale for Test II (in English and Japanese translation)

Extremely ←		Neutral					→ Extremely				
4 3 2 1 0							1 2 3 4				
Familiar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not familiar
Traditional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Modern
Cute	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not Cute
Cool	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not Cool
Intuitive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Logical
Valuable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not valuable
Simple	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Complex
Indigenous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Foreign
Like to look at	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Don't like to look at
Like to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Don't like to use
Like to have	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Don't like to have

Evaluation scale in English

とても ←		どちらでもない					→ とても				
4 3 2 1 0							1 2 3 4				
知られている	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	見知らぬ
伝統的な	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	現代的な
可愛い	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	可愛しくない
直感的	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	論理的
価値がある	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	価値がない
単純な	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	複雑な
見た目が好き	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	見た目が好きじゃない
使いたい	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	使いたくない
欲しい	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	欲しくない
自国的	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	外國的

Evaluation scale in Japanese translation

## Test Sessions for Product Evaluation Test II (In Japan and Nigeria)



Plate 8. A test session of Japanese student participants (Individual)

Advanced research building D, Room 1

Saturday, August 02, 2014, 12:20:18 PM



Plate 9. A test session of Japanese student participants (In group)

Advanced research building D, Multi-media Room 117

Wednesday, September 03, 2014, 1:18:10 PM





Plate 10. A test session of Nigerian student participants (In group)  
Industrial Design studio room, Federal University of Technology Akure.  
September 3, 2014



Plate 11. Another test session of Nigerian student participants (In group)  
Food Science and Technology lecture room, Federal University of Technology Akure  
September 10, 2014, 10:17