'Brand' as Category; An Analysis of Categorisation and Branded Product Concepts.

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Abstract

There has been much published on the business economics of brands, and on their effect on purchase patterns. There is, however, less of a consensus on the mechanisms behind these effects and an understanding of these from a cognitive point of view is only just beginning to emerge. As markets become saturated ever more rapidly, the ability to reliably 'engineer-in' the intended brand-related qualities offers a further competitive edge.

This paper proposes a model of brand effects based on the cognitive processes of categorisation, and commences with a review of theories developed within the disciplines of linguistics, cognitive psychology and semiotics, and highlights the similarities found across these approaches. Empirical evidence is then shown to support the view that some brands behave both as concept property elements (CPE's) of a product, (within a category of product type), and also (perhaps more significantly) as categories in themselves.

Introduction

Rene Magritte's interest in cognitive processing of concepts is exemplified in his mischievous examination 'Ceci n'est pas une pipe', ('This is not a pipe') from the series 'La trahison des images' ('The treachery of images' 1928-1929). His work continued an exploratory tradition into concept recognition, categorisation and meaning across a spectrum of disciplines including; philosophy (Kenny 1994; Margolis & Lawrence 1999), linguistics (Chandler 2002; Eco 1976; Fisher 2003), anthropology (Levi-Strauss 1963), art (Gablik 1985), marketing (Aaker 1991; Basunti 2004; Keller 1993), cognitive psychology (Fodor 1998; Lakoff 1987), product design (Kreuzbauer & Malter 2005; Shackleton 1996), robotics and artificial intelligence (Barnes & Zhi-Qiang 2004; Castelfranchi 2003). Theories proposed throughout often appear complementary and overlapping, but also, occasionally, isolationist; often approaching the same arena from different entrances. Two of these domains, cognitive psychology and semiotics, have common terminologies, but are also differentiated; cognitive psychology concerned with concept recognition 'processes', and semiotics concerned with relationships between the contextual concepts of 'form' and 'content'. This paper draws together some established but disparate research, in relationship to branded product concepts, from cognitive psychology (Aaker 1991) and semiotic viewpoints (Valentine & Evans 1993), using a combined theoretical model. As a prelude to the possible application of the model to future product engineering processes, a study is made of categorisation effects on sets of branded products in order to support the hypothesis that brands act on two levels; 'brand' as a property of a product (categorised by product type), and 'brand' as a category in itself (of product examples with similar properties).

Concept stimuli reception

'Having' a concept involves structured cognitive processes (Pinker 1997) through either physio-psychological 'journeys' of sensing, understanding and learning; to what Kant calls *a posteriori* knowledge (Koerner 1955) or purely philosophical 'journeys' to *a priori* knowledge. *A posteriori* concepts, like the branded product, are 'locked' into memory through experience (Fodor 1998; Mason & Bequette 1998; Simon 1996) of constituent property and performance information (Kleine & Kernan 1991) within expected contexts (Gablik 1985; Grayson & Martinec 2004; Quester & Smart 1998). When encountering concepts, the currently popular computational cognitive model submits the idea that cerebral 'nodes' (neurons) sensitive to specific sensory messages, 'sweep' for Concept Property Elements (CPE's), form comparisons to pre-determined, weighted thresholds, and thus trigger networked neurological activity leading to meaning, understanding and categorisation (Keller 1993; Pinker 1997). On

the other hand, however, structuralists like Ferdinand de Saussure, look at concepts as consisting of a 'signifier' (form of the concept 'sign', for example; like Magritte's painting of a pipe) which corresponds to its meaning, or its 'signified' (the content of the concept; an implement used to smoke tobacco) (Chandler 2002). Correspondingly, at a basic level, single signifiers exist like single CPE's; deconstructable elements of higher level, more complex concepts with multiple definitional properties and multiple signifiers (and their corresponding signifieds) combined in a 'narrative' chain, or semiotic 'code' (Lacan 1985). The 'code', influenced by socio-cultural aspects (Chandler 2002), is usually evident as language, structured in familiar 'bundles of relations' (Levi-Strauss 1963) that perform a 'mediation' process to the concept (Osgood et. al. 1957). However, the 'code' does not need to be complete; cognitive economy and inference later in categorisation inspires a predictive course (Pinker 1997). It is the combination and interaction of salient CPE's; nodes, signifiers, that create appropriate messages that lead to concept interpretation.

Concept categorisation structures

Categorisation theory is a complex and diverse field of research and hypothesis that includes the historically dominant 'Classical Theory', of inferred relationships and definitions identified by structures of 'necessary and sufficient conditions', equivalent to a strictly bounded and definitive sets of CPE's, which can be analytically identified and explained and in which all examples within the category exist 'on an equal footing' (Pinker 1997). A check of category membership is a check of an example's defining features according to those 'necessary and sufficient' conditions (Margolis & Lawrence 1999). However, the Classical Theory, at least, presents three problems. Firstly, it is apparent that not all concepts have definitions with necessary and sufficient conditions. For example, for 'natural' concepts like 'lie', 'knowledge', 'goodness' or 'game', multiple definitions are plausible (Margolis & Lawrence 1999; Rey 1999); even more so for ad-hoc categories like 'things to sell at a car-boot sale' (Barsalou 1983). In consideration of such inconsistencies, Wittgenstein famously proposed an alternative; that category members share 'family resemblances', defined in a 'complicated network of similarities overlapping and criss-crossing: sometimes overall similarities, sometimes similarities of detail' (Kenny 1994, p44). Secondly, exemplars can be more or less typical of the concept category (Lakoff 1987), for example; research shows that '13' is considered a better example of the concept 'odd number' than '23', despite 'odd number' being a 'crisply bounded' category (Pinker 1997), and finally, some concepts tend to emerge, or decline and their category boundaries evolve (Martindale 1990); consider, for example, the changing taxonomy of 'telephone', 'word processor' or 'domestic architecture'.

Specifically, classical theory struggled most with the second problem, leading to the emergence of 'Prototype Theory' in the 1970's, which acknowledged a property, 'typicality', a measure of 'goodness of fit' within a structure of context and association to other exemplars of a concept. The structure can be drawn on two axes; category segmentation being horizontal, and hierarchy of category inclusiveness being vertical, segmented into six 'levels' (Fodor 1998; Lakoff 1987; Margolis & Lawrence 1999) (Figure. 1). The fourth (or 'genus') level being where the most CPE's shared with other category exemplars are found (Fodor 1998; Lakoff 1987) and where segmentation and inclusiveness crosses in a 'zone of prototypicality'.

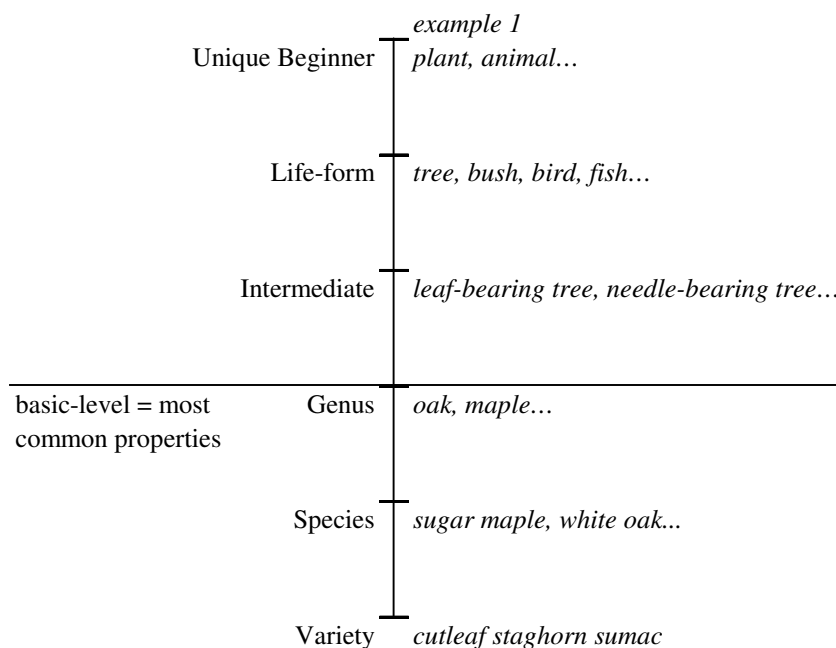| | | *example 1* |
Unique Beginner		*plant, animal…*
Life-form		*tree, bush, bird, fish…*
Intermediate		*leaf-bearing tree, needle-bearing tree…*
basic-level = most common properties	Genus	*oak, maple…*
Species		*sugar maple, white oak...*
Variety		*cutleaf staghorn sumac*

Figure 1. Concept hierarchy structure (Lakoff 1987)

In semiotic theory, category structures exist under different terms; if the horizontal segmentation is viewed as constructed from x or y or z exemplars, and the vertical hierarchy constructed from a and b and c associative relationships, it can be proposed that the model then performs similar functions to Saussure's syntagmatic and paradigmatic axes, where the former is concerned with hierarchical, contextual, relationships of signifiers and signifieds and the latter with detail or substitutional relationships (Chandler 2002; Valentine and Evans 1993). Often, semioticians refer to the associative relationship is described in terms of 'what something is not'; why one thing is chosen against another, as knowing what something is, by first knowing what it is not, appears to be a central mechanism in human understanding (ibid).

It is within these axial relationships that semiotic meanings lie and where brand 'myths' then emerge (Valentine 2002), through reconciliations of syntagmatic and paradigmatic axial contradictions, or opposites, (for example; 'home-cooked convenience foods' [Marks and Spencer] or 'caring efficiency' [Persil], or 'emotional safety' [Volvo] (Alexander 1996; Karjalainen 2005; MacFarquhar 1994; Valentine & Evans 1993).

Category associations and attributes

The cognitive processes of concept stimuli and categorisation follow a linear path to meanings, beliefs and associations (i.e., attributes) that attach to concepts and further thoughts or actions that result (Fodor 1998; Pinker 1997). Significant research has been published into the ability of brands to provide for cognitive association (for example; Aaker 1991; de Chernatony & McDonald 2003; Czellar 2003; Franzen & Bouwman 2001; Keller 1993; Lindstrom 2005). They postulate that branding is not as an 'input process', devised and applied by marketers to a product, but an evaluation of meaning made in the consumers minds, such that the brand is better understood as a consumers view of the product, rather than the producers. Indeed, it is how consumers feel about a brand that is one of the keys to satisfaction and purchase (Keller 1993). 'Brand equity', therefore, exists when the consumer has favourable or unique cognitive associations stimulated by the brand or product properties (ibid), which can be so powerful as to enhance normality; research shows that consumer approval of the breakfast cereal Corn Flakes increases from 47% to 59% when the brand (Kellogg's) is known, and in American Motors / Renault clinics, consumers suggested that they would pay up to $3000 more for a car with a premium badge verses an identical model without a designation (Aaker 1991), or brand specific product property associations suggest 'a Rolls-Royce rides more smoothly if it has a leathery smell' (Lindstrom 2005, p103). Through combining associative links to and from product concepts in a process of contiguity of thought, or a narrative code of extending signs, viewed in relationship to other concepts through socially constructed associations, brand meaning can be made (MacFarquhar 1994). Lindstrom encourages brand custodians to deconstruct this code and examine the strength of the associative links through to the CPE's that stimulated it, emulating the brief for the designer of the 'Coke' bottle; create a design which could be instantly recognised from a single piece if it were smashed on the floor (Lindstrom 2005).

The evolution of categories

Wittgenstien, Lakoff and Fodor all argued that concept categories have 'fuzzy boundaries' (eg: 'tall man'; Lakoff 1987) which change as examples with recognisable resemblances evolve, or

when new examples appear (Lehmann & Pan 1993). Consider the category 'personal music machine'; the 1980's 'prototype' was probably the Sony Walkman; it was the most recognisable example of its generation. Today, the prototype is notionally the i-Pod (Naughton 2006), although some evidence is emerging that ubiquity of this product is leading to signs of a decline in its popularity amongst some groups (Avruch 2006), and therefore to the potential diffusion of this prototype. Technology changes are responsible, but some influence can be attributed to 'laws of novelty' (Martindale 1990); evident in a number of artistic fields like art, poetry and architecture, for example, where habituation forces novelty to occur as each 'design' practitioner searches for more novel approaches than their predecessor or peer, and where product attractiveness is evident through a balance of novelty and typicality (Hekkert et. al. 2003; Snelders & Hekkert 1999). Martindale proposes this effect is measurable and predictable, with category typicality 'peak shift' occurring through the desire for ever-increasing pleasurable properties, as the old becomes familiar and dull (ibid).

Categories and Brands

Correlation, between cognitive, linguistic and brand structures has been comprehensively presented (see Franzen & Bouwman 2001 for an extensive review). Most commonly measured, though, are the influences of brand CPE's on the product category segmentation axis (Kreuzbauer & Malter 2005; Meyvis & Janiszewski 2002). Emerging hypotheses, however, also suggest that some brands behave as categories themselves; they adhere to the horizontal and vertical concept structures within our mental constructs, their constituent category members being the products of the brand (Boush 1993; Joiner & Loken 1998; Loken, Joiner & Peck 2002). Even so, little evidence exists to support such hypotheses, though emphasis on associative cognitive phenomena supports a holistic view of brand structures mirroring other concept structures. Potentially, also, there is a theoretical effect of this proposal, which could be useful for product marketers, designers and engineers; where salient CPE's can be specified for 'Brand Product Concepts' (BPC's), which promote brand prototype effects and therefore associations of 'authenticity', positive beliefs, values, emotions and, consequently, meaning.
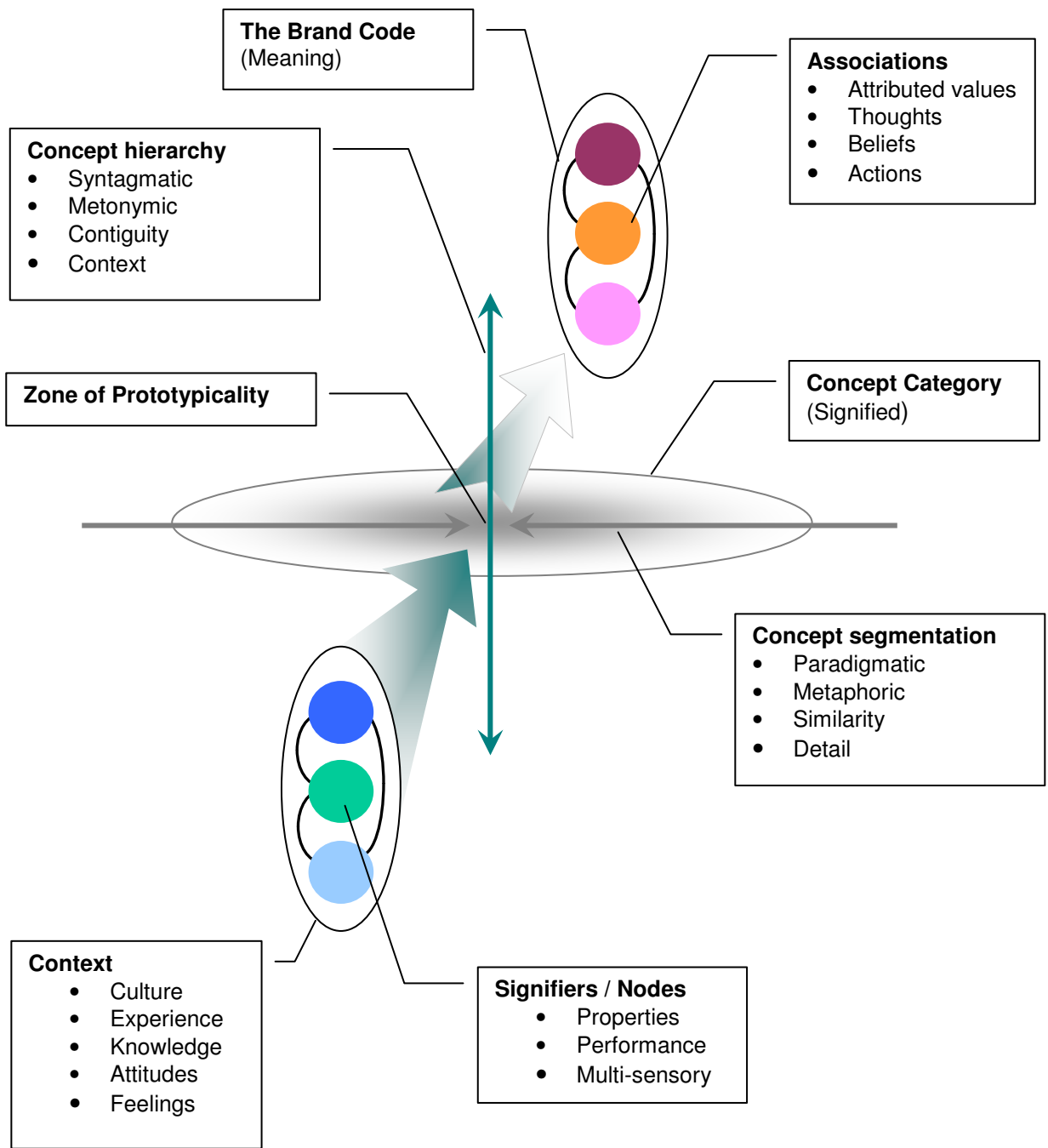
The Brand Code
(Meaning)

Associations
- Attributed values
- Thoughts
- Beliefs
- Actions

Concept hierarchy
- Syntagmatic
- Metonymic
- Contiguity
- Context

Zone of Prototypicality

Concept Category
(Signified)

Concept segmentation
- Paradigmatic
- Metaphoric
- Similarity
- Detail

Context
- Culture
- Experience
- Knowledge
- Attitudes
- Feelings

Signifiers / Nodes
- Properties
- Performance
- Multi-sensory

Figure 2. Combined theoretical concept processing model

Figure 2, illustrates the combined model of cognitive processing of concepts reviewed above, moving through stimulation, categorisation, association and meaning. As a prelude to the application of the model, and to support underlying theoretical positions and calls for verification of them (Boush 1993), a test of the basic hypothesis; that some brands behave as categories, appears appropriate and prudent at this point. The central tenet of the test being that identification of a product by brand or product type is an effect of cognitive categorisation.

Therefore, it appears predicted that, if asked: 'What is this?' when encountering a product, the cognitive processing illustrated above will lead to responses categorised by brand rather than product type in some *a posteriori* brand knowledge cases.

Brand Categorisation Test

A study was therefore designed to test the prediction using 65 pictures of products from four product types; cars, mobile telephones, MP3 players and vacuum cleaners (Table 1).

Cars	Mobile Telephones	MP3 Players	Vacuum Cleaners
Nissan Z350	Nokia	Sansa	Dyson
BMW 3 Series	Motorola	Apple i-Pod Mini	Bosch
Cadillac Concept	Motorola	Toshiba	Miele
VW Beetle Cabriolet	Siemens	Sony	Gisowatt
Hyundai	Sony Ericsson	Creative	Dyson
BMW Mini 1	Nokia	Unknown	George
Audi TT	Nokia	Unknown	Hoover
Toyota Pryus	Samsung	Sanyo	Panasonic
Ford Mondeo	Nokia	Samsung	Unknown
VW Golf mk3	Samsung	Apple i-Pod Nano	Sebo
Ford Focus	Nokia	Apple i-Pod	Dyson
Toyota Yaris	Samsung	Apple i-Pod Shuffle	Miele
Suzuki Swift	Siemens	Unknown	Dyson
VW Phaeton	Siemens	Apple i-Pod	Dyson
Opel Vectra			Hoover
Bentley Continental GT			
Chrysler			
Audi A8			
VW Jetta			

Table 1. Test types and examples in sequence

A number of established brands were included in the types; 'Volkswagen', 'BMW', 'Nokia', 'Apple I-Pod', 'Dyson' and 'Hoover', for example, as well as products from the types that were less familiar, including some which were unknown to the authors. Images were shown in a timed (10 seconds per image), random order, to 59 subjects who were asked to provide

written responses to the question 'What is this?' Figure 3 gives typical image examples. The subject group consisted of undergraduate design students; 83% male, 88% British, average age 22 years. Due to the groups' predominant socio-demographic background, it was expected that most would have high brand awareness for cars, telephones and MP3 players, but not for vacuum cleaners. It was also recognised in the test that CPE's were limited to visual stimuli only.

Figure 3. Example test images

Drawing upon other themes explored in this review, some peripheral questions were also of interest, which conditioned the choice of examples, specifically:
a). How do brand extensions such as the 'Volkswagen Phaeton' affect brand categorisation?
b). Does identification of products as 'Hoovers' in the category 'vacuum cleaners' still exist?
c). What are the brand categorisation effects within a saturated product market like mobile phones?
d). Does a visible brand name or logo affect categorisation?

Initially, written responses to the question 'What is this?' were organised by the first author into four categories naturally evident in the responses: i) those identified by the correct brand (for example; 'Apple' or i-Pod' or 'Nano', or any combination, for the Apple i-Pod Nano); ii) those identified by another brand (either in error or by use of the brand name to reference a generic product type, for example; 'i-pod' for the Sony MP3 player, or 'Hoover' for the Panasonic vacuum cleaner); iii) those identified by product type (for example; 'car' for the Ford Focus), and iv) no response, the first three being syntagmatic constructs in concept recognition. During organisation of the responses, a fifth construct emerged; one that is a paradigmatic construct; that of an image being identified by either the brand or product association, for example, 'cool', 'engineering quality', 'expensive' for the brand Bentley.

These categorised responses were analysed using homogeneity analysis. Homogeneity analysis is a multivariate analysis for nominal (ie: non-ordinal) categorical data, and is largely analogous to exploratory factor analysis (Gifi, 1990). The output produced is a scatter-plot on factor-like axes, in which items that are consistently categorised as similar will be placed

closest together, and those that are consistently categorised differently will be furthest apart in the output distribution. Although the technique can produce higher dimension output, a satisfactory distribution in two dimensions was found, and this was then subject to a rigid rotation to provide the most parsimonious factors. The first of these two 'factors' appears to correspond to BPC strength (y-axis); a bi-polar measure of the degree to which an example is consistently categorised by brand (at one extreme) or by product type (at the other extreme). The second factor (x-axis) appears to correspond to BPC accuracy; the degree to which an example is identified correctly (either correct brand or correct product type) (Fig. 4).
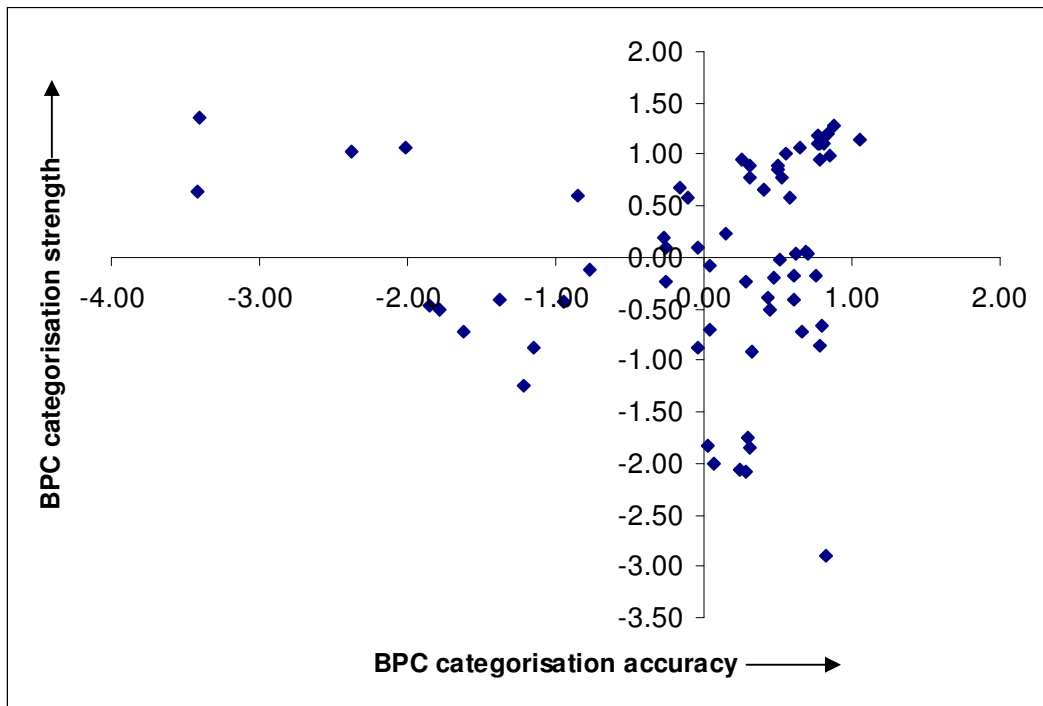
Figure 4. BPC categorisation factors

A number of interesting effects from the analysis were identified. Cluster [a], Figure 5 and Table 2, includes 20 points demonstrating high BPC categorisation strength and accuracy. This cluster is noteworthy because it demonstrates that categorisation for these exemplars are based upon the brand category and not the product category. Cluster [b] includes 4 points that showed low BPC categorisation with low accuracy, interpreted as a strong inverse product type categorisation (or mis-branding categorisation). For example, 'Bosch' (vacuum cleaner), 'Cadillac' (concept car), 'VW Phaeton' and 'Chrysler' were repeatedly identified as other brands. This cluster prompts particular concern to the marketer because it suggests these products are recognised as being from competing producers, or a number of competing producers, although associational benefits could be significant to brand-categorisation stretch.
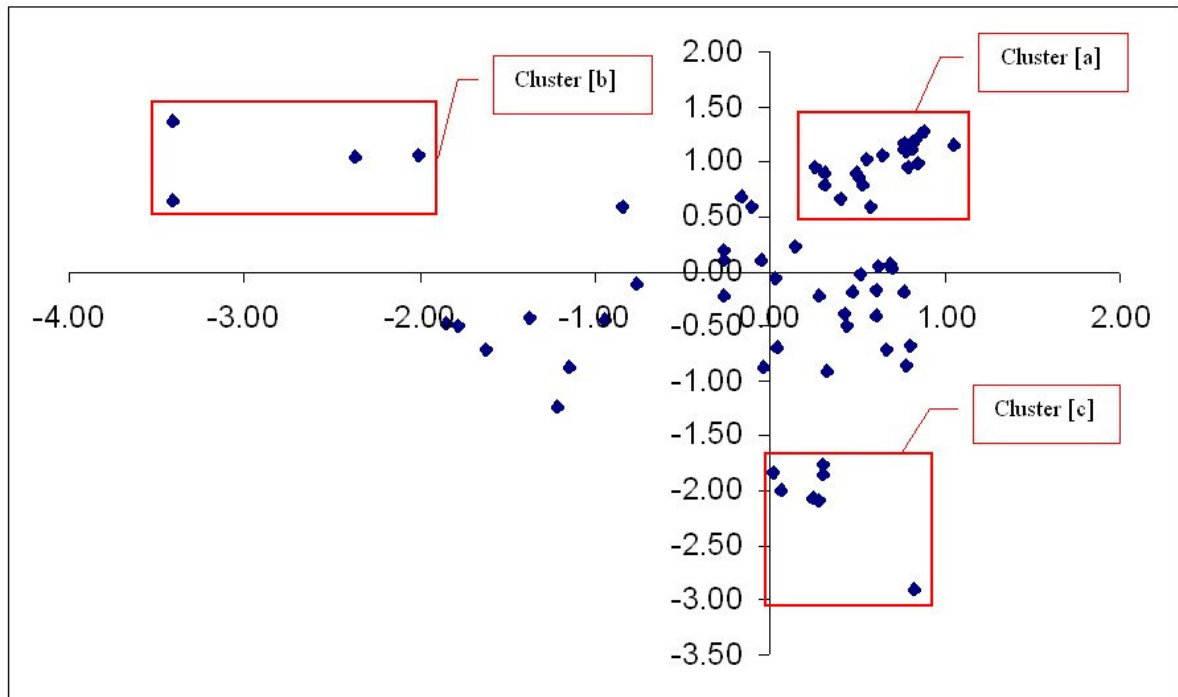
Figure 5. BPC categorisation – significant clusters

Cluster [b] demonstrates brand categorisation in part, as the examples are categorised by brand, although inaccurately. Cluster [c] includes 7 points that demonstrate low BPC categorisation and low accurately but high product type categorisation. Arguably, this cluster would not cause undue concern to the marketer as examples are accurately recognised for what they are and do, although BPC categorisation effects are weak. Importantly, the pattern demonstrates that as BPC strength increases so does accuracy (Fig. 6), peaking in a zone of high brand saliency, where the brand concept is cognitively efficient.

In Figure 7 we can see the effect of brand extensions on BPC categorisation. For 'Volkswagen' there is a cluster of strong and accurate exemplars ('Beetle', 'Jetta', 'Golf'), but 'Phaeton' is not perceived to be among them, nor is it accurately identified; here it stretches the boundary of the 'Volkswagen' category, being associated with other brand categories, and also outside the alternative product type category; 'car'. The effect supports the hypotheses, where the subject group's established expectations of 'Volkswagen' do not appear congruent with the example. Associational benefits are present, however, as stretching the categorisation in this case successfully connected the example with other luxury executive saloons in a syntagmatic relationship (responses included, for example; 'Audi', 'Saab') and also in a paradigmatic relationship (for example: 'executive', 'long and fast', 'office').

Brand	Product	Factor 1. BPC categorisation accuracy	Factor 2. BPC categorisation strength	Brand	Product	Factor 1. BPC categorisation accuracy	Factor 2. BPC categorisation strength
Apple	i-Pod (5)	1.05	1.14	Dyson	(24)	0.65	1.07
VW	Beetle	0.88	1.27	Ford	Focus	0.58	0.59
BMW	3 Series	0.85	0.98	Audi	A8	0.55	1.02
Apple	i-Pod Shuffle	0.83	1.20	VW	Golf	0.53	0.78
Apple	i-Pod (44)	0.81	1.17	Dyson	(48)	0.50	0.89
Apple	i-Pod (61)	0.81	1.11	VW	Jetta	0.50	0.86
Audi	TT	0.78	1.10	Dyson	(63)	0.40	0.65
Dyson	(58)	0.78	0.95	Ferrari	F350	0.32	0.89
BMW	Mini	0.77	1.17	Dyson	(2)	0.31	0.78
Apple	i-Pod Nano	0.76	1.11	Bentley	Continental GT	0.25	0.94

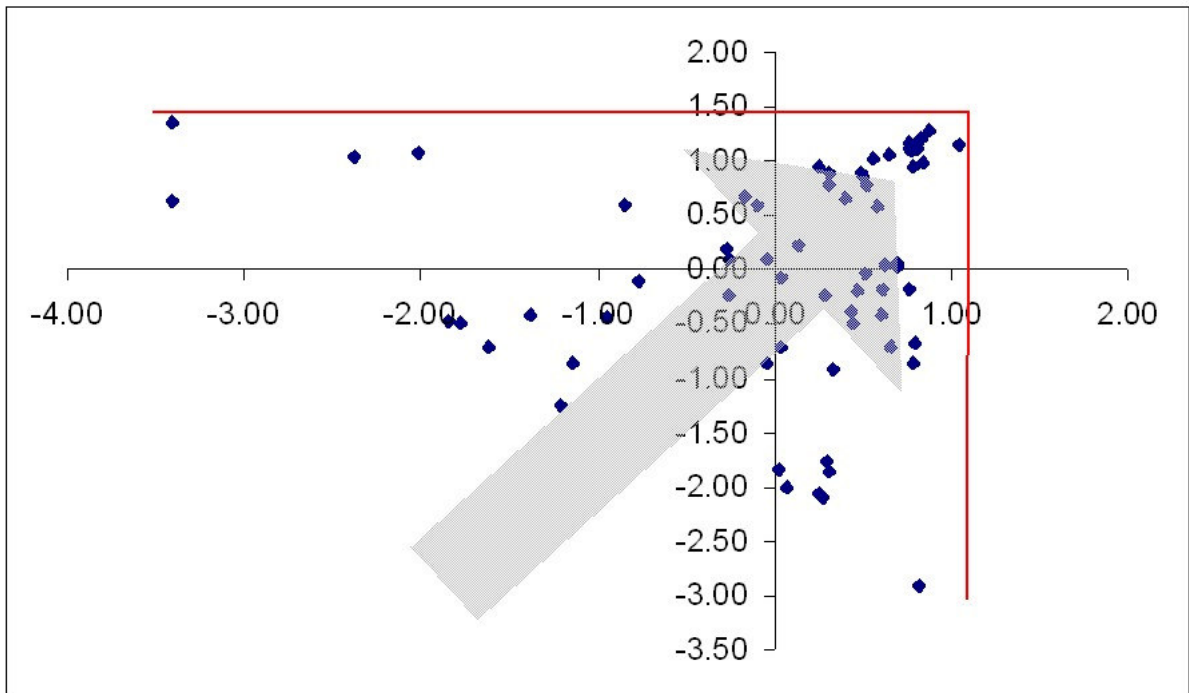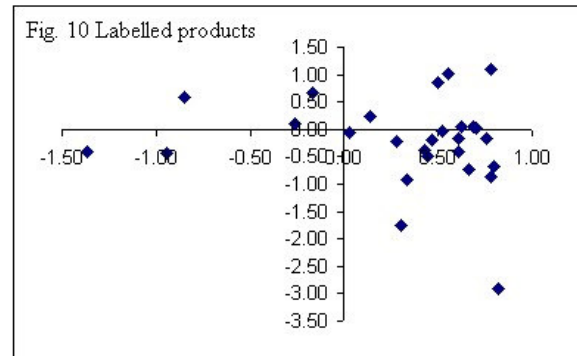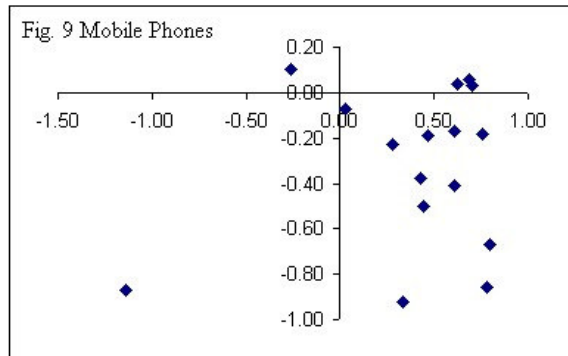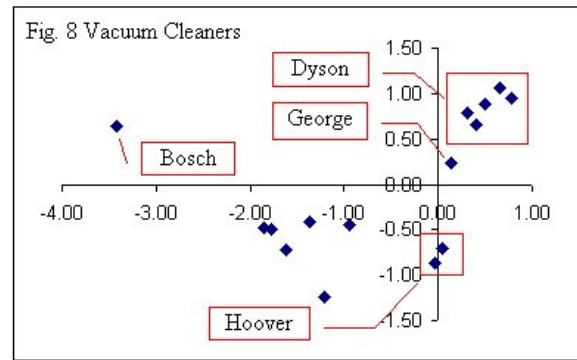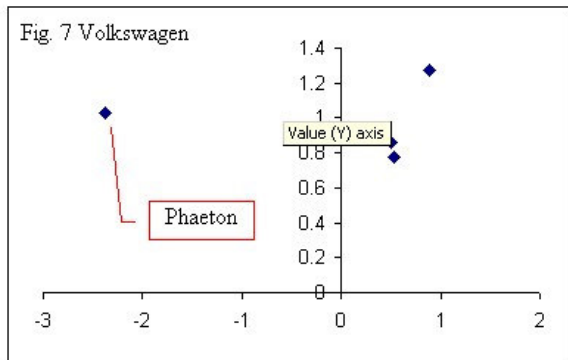Table 2 – Cluster [a]. – Ranked by BPC categorisation strength response

Figure 6. BPC categorisation strength and accuracy vector.

Figures 7 to 10 explore trends relevant to questions a) to d) above.

Figure 8 explores the 'Hoover effect'; where products in the product category are identified by a brand name. It could be predicted that if this effect were strong, all examples of vacuum cleaners that were not Hoovers would have low BPC categorisation values with low accuracy, being incorrectly identified by both brand and product type. Conversely, those that were Hoovers would predictably have strong and accurate BPC values. However, in this subject group, this effect appears weak; strong and accurate examples being categorised by their own brands ('Dyson', 'George') and 'Hoover' products unexpectedly biased further towards product type categorisation accuracy ('Vacuum Cleaner') than any other examples. Only one example was mis-categorised repeatedly as a 'Hoover': a cleaner by 'Bosch'. It can be proposed, therefore, that the 'Hoover effect' is dying within this socio-demographic group.

Within the Mobile Phone example set, a syntagmatic bias emerges towards product type categorisation (Fig. 9). Brand concept categorisation strength is highest, however, with 'Nokia', with other brands randomly arrayed. It is apparent, within the set of examples chosen that visual themes within and across brands are difficult to identify, therefore, it is concluded that insufficient brand CPE's exist with these examples to stimulate brand concept categorisation.

To demonstrate that BPC categorisation effects are not influenced by branding, ('names' or logo's) evident in the pictures, the data was analysed against those where the brand name was present. Figure 10 shows the spread of the 27 examples that were 'named', originating from all 4-product sets. Two effects are evident that suggest the presence of 'names' did not influence categorisation in this study. Firstly, Cluster [a], the group with strong and accurate BPC categorisation effects included only 3 examples (of 20) that were 'named'. Secondly, there appears to be a trend towards a syntagmatic vector, with some examples categorised inaccurately against their brand, preferring product type categorisation.

Conclusion

This paper started with the objective of proposing a combined model of concept understanding; it's stimuli, categorisation and prototype structure and meaning constructed through knowledge, associations, values and beliefs, built from a review of theories developed within the traditions of cognitive psychology and semiotics. The model has been applied to some sets of Brand Product Concepts (BPC's) to provide evidence to support hypotheses that some brands are both Concept Property Elements (CPE's) of a product, within a product type category and categories in themselves. Further it is inferred that predicted categorisation segmentation does occur when brand extensions are stretched, that brand / product categories like 'Hoover' do evolve and that cognitive processing is not influenced by apparent product 'names'. It is recognised, however, that the effects demonstrated were evident within a limited socio-demographic group. As predicted, this group had strong brand awareness for some of the product sets chosen, which may not be the case with other groups, or other product sets. Further research with these variables would be valuable to identify agreement and /or other effects.

The benefits of this and further research apply to the fields of marketing and product engineering. When 'engineering the brand'; developing products that support and reinforce Brand Product Concepts, recognised 'through the minds of the consumer', considering such cognitive process and brand constructs are important foundations for the designer or engineer. Indeed, evidence exists in a number of product markets, especially luxury goods, that consumer satisfaction is largely based on the identification of brand 'authenticity' (Carbonaro & Votava 2005). Therefore, it appears important that specific brand Concept Property Element (CPE) specifications be established to influence these cognitive process outputs, leading, in turn, to new products that are recognisable to the consumer, through specific multi-sensory stimuli, as being 'typical' of the Brand Product Concept (BPC) (see Abbott et. al. 2006).

Further benefits can then be imagined, for example; by getting to engineering solutions quicker that are not only good, but are also right for the brand, engineering efficiency could be improved (through the elimination of multiple test-modification-test loops); by assessing new concepts against brand CPE's, brand positioning and extension opportunities can be analysed more effectively, guaranteeing customer satisfaction of new products that whilst being novel, potentially, are also recognisable, authentic and familiar.

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