Using brand personality to assess whether biotechnology firms are saying the right things to their network

Lisa Papania, Colin Campbell, Robert Ankomah Opoku, Maria Styven and Jean-Paul Berthon

Date Received: 28th March, 2008

Lisa Papania
is a PhD candidate at Simon Fraser University, Vancouver, Canada. Prior to entering the doctoral programme, she held a number of marketing management positions and was an academic case writer and part-time lecturer in Marketing and Strategy. Her current research focus is corporate governance and social responsibility.

Colin Campbell
is a PhD candidate in marketing at Simon Fraser University, Vancouver, Canada, where he is researching various aspects of advertising. His work has been accepted for publication in journals such as *California Management Review*, *Industrial Marketing Management*, *Journal of Business Research*, *International Marketing Review and the Journal of the Operational Research Society*.

Robert Ankomah Opoku
is Assistant Professor of Marketing in the Graduate School of Business, King Fahd University of Petroleum and Minerals, in Dahran, Saudi Arabia. His work has been published in *Tourism Management*, *Journal of Brand Management* and the *Journal of African Business*, and his research interests are in online brand management.

Maria Styven
PhD, is Assistant Professor of Marketing in the Division of Industrial Marketing and eCommerce, Lulea University of Technology, Lulea, Sweden. She has published her work in journals such as the *European Journal of Marketing* and *Popular Music and Society*. She is currently researching the online music industry.

Jean-Paul Berthon
PhD, is Associate Professor of Marketing, Richmond University, London, UK. He has published his work in journals such as *Journal of International Marketing*, *International Journal of Advertising*, and *Business Horizons*. He has also taught in Denmark, the UK, and various parts of Africa.

Abstract

Through their websites, biotechnology firms communicate information about themselves and their products to other members of their networks. These networks are made up of an array of organisations with which biotechnology firms collaborate on product development projects, and on whom they rely for funding, and/or marketing and production. Therefore, it is important that the information communicated by firms' websites portrays them in the light they wish to be perceived by others. Despite its importance, biotechnology firms, however, do not prioritise branding or the development of a brand personality. By using demonstrated content analysis methodologies, our study shows that biotechnology firms *are* nonetheless portraying brand personalities online, even if unintentionally. We show that, by using the same methodologies, managers in biotechnology firms can

Correspondence: Colin Campbell, Simon Fraser University,
8888 University Drive, Burnaby, BC, Canada, V5A 1S6
Tel: +1 778 782 7712
Fax: +1 604 2915122
E-mail: colinlcampbell@mac.com

monitor and manage their firms' brand personalities to ensure that the words they communicate online present an appropriate and attractive image of the firm to their communities. We extend previous research in the area of brand personality and show its application in and importance for the biotechnology industry.
Journal of Commercial Biotechnology (2008) **14,** 247–255. doi:10.1057/jcb.2008.14;
published online 29 April 2008

Keywords: *biotechnology firms, brand personality, website communication, content analysis*

INTRODUCTION

It is difficult to pinpoint the biotechnology firm's customer. Within the dynamic and evolving community that makes up the biotechnology sector, biotechnology firms appeal to, interact with, and encounter big pharmaceutical companies, universities, research laboratories, venture capitalists, and pharmaceutical consumers. The relationships and reputation that the firm cultivates in this network determine whether the firm will secure research, financial, manufacturing, and marketing support.[1,2] Therefore, although the biotechnology firm might not focus on marketing its end product, the firm is constantly in the process of branding, that is, creating a differentiated image of itself and its offerings.[3]

'Brands are symbols around which social actors, including firms, suppliers, supplementary organisations, the public, and customers construct identities' (Opoku *et al*[3] p. 362). Brands can be understood as the images created by firms, intentionally or unintentionally, and communicated to others.[4,5] Brands transmit information that enable outsiders to gain insight into the firm, thereby assisting them in their evaluations of the firm and its activities.

Despite the importance and specific relevance of brands to biotechnology firms' forming and maintaining relationships within their community, the dearth of literature on branding in the biotechnology sector provides evidence that the vast sum of money utilised by biotechnology firms[6] are not being specifically allocated to cultivating images and brands. Nonetheless, biotechnology firms are ideally positioned to participate in online social networks, indicating linkage and communication with other actors in the community.[1] Therefore, while their primary objective may not be to develop brands, these firms do prioritise the development of websites through which they communicate information about themselves and their products. Since the resulting brand image is largely unintentional, firms should be concerned about what is being communicated by their websites.[1] This is especially so in the biotechnology sector, where a reputation for productive collaborative relationships, successful products, and strong network ties is crucial in ensuring firms' continued involvement in the community.[2]

Extending research by Pitt and colleagues[7] in the small and medium enterprise sector, we seek to analyse whether distinct brand images are communicated by biotechnology firms via their websites. By applying the methodology demonstrated by these authors, we show the value that content analysis holds good for managers of biotechnology firms. Using this tool, firms can easily and affordably gauge whether they are portraying accurate or desirable images of themselves and their activities to others in their network.

To this end, we structure our paper as follows. First, we define the concepts of brand, brand image, and brand personality in order to explain the relevance of the brand personality scale (BPS) as a tool for analysing biotechnology firms' websites. Then, we discuss the results of our analysis of the brand personalities of the top ten biotechnology firms of 2005.[8] We explain the usefulness of the methodology for managers wishing to manage the brands they communicate online.

Finally, we identify several limitations of our research and the methodology that might be overcome by future research.

BRAND IMAGE AND BRAND PERSONALITY

Brand image is understood to be what the firm wants others to think of it.[4] By studying what a firm articulates about itself, we are able to form an idea of its brand image.[7] This articulation, in the form of deliberate and unintentional word and concept associations transmitted via corporate communication (including websites),[4,9] carves for the firm a distinct position in the recipient's mind.[10] This position, thus, separates the firm from others in the industry.[11] Positioning brand using image-building campaigns is a cornerstone of brand marketing practice.[12]

Firms' actions of communicating to outsiders about their characteristics and activities correspond with an interpretation of personality from the field of social psychology.[13] In this interpretation, personality is a set of internal processes and propensities that explain why an individual (here, the firm) does things in a particular way.[7] Research shows that consumers assign human personality traits to brands. Thus, it stands to reason that the brand images perceived by a consumer become interpreted as the brand's personality, which enables the consumer to form a relationship with the brand.[14] Since the concept of brand personality emerged over three decades ago, there has been a burgeoning interest in the subject among marketing academics and practitioners.[3] The fact that firm communication enables the consumer to identify the brand's image and, thus, personality, has important consequences for managers. Their role in deploying, monitoring, and managing their brands strategically is clear.[15]

BRAND PERSONALITY SCALE

As discussed, the marketing concept of brand personality has been adapted from the field of individual and social psychology. The theory is that brands, like people, have identifiable personalities with characteristics similar to those found in humans.[16] Our study, therefore, extends Okopu *et al.*'s[3] study on the online communication of brand personalities into the field of biotechnology. Research into online brand image and, by association, brand personality, has been conducted recently by Lamertz *et al.*[17] 'Using website information is consistent with the assumption that images are constructed by organisations through explicit communications and deliberate identity claims'.

Since, to some degree, biotechnology companies can be seen to mirror their offline network on the internet[1] we are able to justify wanting to analyse how these firms portray themselves on their websites. To conduct this analysis, we follow Opoku *et al.*'s[3] methodology based upon Aaker's[16] (p. 347) definition of brand personality as 'the set of human characteristics associated with a particular brand and how these are communicated'. Aaker[16] develops a 42-item BPS that analyses any brand on five key dimensions: sincerity, excitement, competence, sophistication, and ruggedness. The dimensions of the BPS used in our study enable us to explore and identify the communicated images of brands.

Aaker's[16] scale proposes a set of adjectives that describe the most important personality differences between people compiled from previous personality measures employed in psychological and marketing research.[3] While brand personality questionnaires are often administered to individuals, our study (in line with Opoku *et al.*'s[3] research) uses the content retrieved from biotechnology firms' websites as input. Previous research by Berthon *et al.*[18] deems this acceptable, since the information posted online focuses on communicating fairly stable and routine characteristics and attributes of the organisation, which enable the analyst to understand an overall image of the organisation. As mentioned, biotechnology firms' brand personalities are assessed in terms of what is communicated by the firms about themselves.

ANALYSIS

In this section of the paper, we describe our data sources, detail the data analysis techniques used, and present our results.

Data sources

The goal of the present study is to apply an existing methodology of investigating corporate brand personality communicated through the websites to biotechnology firms, and, in addition, to represent the results of such analysis in a manner meaningful to both academics and practitioners.

The biotechnology firms used in this study were selected based on a privately conducted market research report by Business Insights.[8] While the report was not up-to-date at the time of this study, the focus of the present investigation is demonstration of a methodological approach that is not specific to particular firms. The present analysis can be replicated on any set of firms.

The top ten biotechnology companies analysed in this study are:

1. Amgen (www.amgen.com)
2. Genentech (www.gene.com)
3. Serono (www.merckserono.net)
4. Biogen Idec (www.biogenidec.com)
5. UCB-Celltech (www.ucb-group.com)
6. Genzyme (www.genzyme.com)
7. Gilead (www.gilead.com)
8. MedImmune (www.medimmune.com)
9. Chiron (www.chiron.com)
10. Millenium (www.mlnm.com)

Top biotechnology companies were chosen in order to maximise reader familiarity as well as partially control the effects that differences in company size may bring. For instance, large biotechnology firms may have much more extensive website simply because they can afford a dedicated web team. By sampling the top ten firms we somewhat controlled for this difference as each firm featured a professional website replete with content. The number of firms analysed was held at ten to conform to the ranking list used as well as keep results clear and easy to interpret.

All available textual data on each firm's website was downloaded and stored for analysis. While it can be argued that a more selective approach could have been employed, relying on raters to decide which pages were sampled would have introduced subjectivity into our investigation. Using all text on each website had the further advantage of ensuring that no relevant data went undiscovered. The amount of text on a company's website may also be indicative, in and of itself, of just how much the firm cares about its brand or certain issues. Firms that put more effort into developing elaborate websites detailing themes such as their corporate social responsibility should have such effort reflected in analysis of their brand personalities.

Data analysis techniques

Biotechnology firm websites were analysed using content analysis, a statistical technique that combs textual data for particular words, meanings, ideas, or themes.[19] Content analysis is a well-regarded tool within the marketing literature as well as other social sciences.[20,21]

WordStat statistical software was used to analyse our data.[22] A description of qualitative research techniques and analysis is presented in the work of Sinkovics *et al.*[23]

Key to any content analysis is construction of an electronic representation of the dimensions being investigated. In our case, this meant compiling a list of synonyms for Aaker's[16] brand personality dimensions. Rather than construct the list from scratch, we employed an existing dictionary used in previous research on the same dimensions.[3] The existing brand personality dimension list was created by finding available synonyms to Aaker's[16] (p. 354) five basic dimensions as well as 42 personality trait norms, which are useful for comparing brand personalities. The basic five dimensions are:

- Sincerity (domestic, honest, genuine, and cheerful)
- Excitement (daring, spirited, imaginative, and up-to-date)

- Competence (reliable, responsible, dependable, and efficient)
- Sophistication (glamorous, presentation, charming, and romantic)
- Ruggedness (tough, strong, outdoorsy, and rugged)

Opoku *et al.*'s[3] list was constructed using two people and then merged through retaining only those synonyms identified by both. The resultant list totalled 922 words split across Aaker's[16] five original dimensions of brand personality (sincerity 20 per cent, excitement 19 per cent, competence 21 per cent, sophistication 21 per cent, and ruggedness 19 per cent) and was converted into electronic format using WordStat software.

Once the five brand personality dimensions were within the WordStat software package, analysis of the downloaded textual data from each biotechnology firm took place. During the automatic categorisation process, words with little semantic value (such as pronouns) were removed, and words were reduced to their simplistic forms through a process called stemming. The process of stemming changes words back into their singular or other root forms and readies them for content analysis.[22] During content analysis, the newly transformed website text is analysed for words matching any of those in our predefined five-facet brand personality dictionary.

Content analysis was used to ascertain how the textual content on each of the ten biotechnology firms investigated was distributed across Aaker's[16] brand personality dimensions. The next step in our analysis was identification of associations between the websites and brand personality dimensions. This was conducted using correspondence analysis, a perceptual mapping technique that takes cross-tabulated data and projects it onto a joint space map through a decomposition of the chi-squared statistic.[24–26] Correspondence analysis allows for comparison of the firms across all five brand personality dimensions rather than only one or two of the dimensions at a time. The technique is well suited to exploratory data analysis,[27] relatively easy to interpret,[28] and adept at revealing structural relationships between variables.[29]

RESULTS

Table 1 displays a frequency table detailing association between the biotechnology firm brands and brand personality dimensions while a summary of the correspondence analysis results is shown in Table 2.

Examination of the square root of the trace of the eigenvalue decomposition reveals a value of 0.205, which meets the threshold of 0.20 needed to establish dependence between the brand personality dimensions and

Table 2: Correspondence analysis: eigenvalue report

	F1	F2	F3
Eigenvalue	0.020	0.014	0.008
Rows depend on columns (%)	45.910	33.290	18.600
Cumulative %	45.910	79.039	97.639
Trace	0.042		
Root trace	0.205		

Table 1: Frequency response matrix

	Competence	Excitement	Ruggedness	Sincerity	Sophistication
Amgen	4,157	910	460	1,072	66
Biogenidec	477	165	67	314	16
Chiron	755	378	59	278	19
Genentech	7,149	1,534	36	2,740	118
Genzyme	1,926	377	74	518	60
Gilead	1,111	393	83	135	21
Medimmune	981	193	29	103	5
Merckserona	254	124	28	106	13
Ucbgroup	318	72	54	218	4

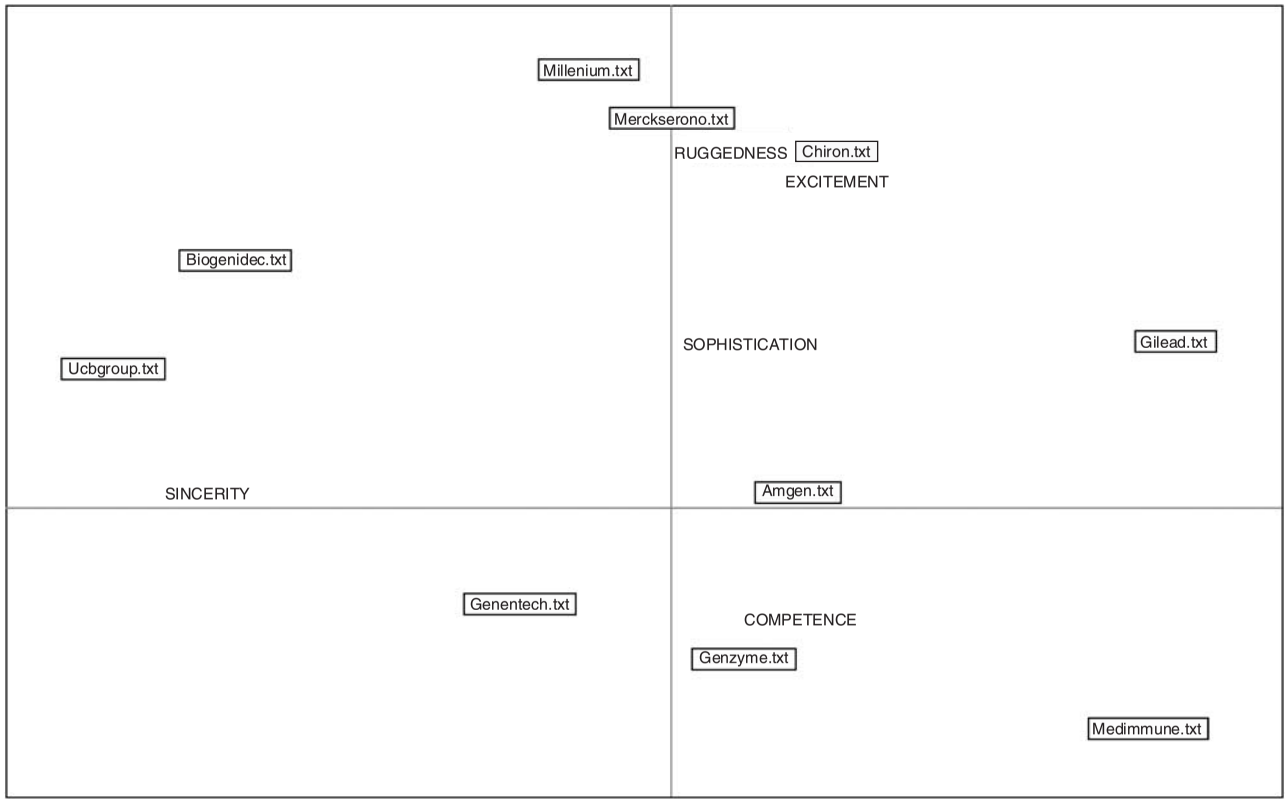

Figure 1: Asymmetric plot
Notes: Biotechnology companies are in boxes, personality dimensions in capital letters. Factor 1 is graphed along the vertical axis, Factor 2 along the horizontal. Together, both factors yield a cumulative percent explained of 79.04 per cent

biotechnology brands.[26] Dimensionality of the solution was investigated by examining the eigenvalues and cumulative proportion explained.[24–26] Owing to the preference towards two-dimensional solutions, due in large part to the greater acceptance and understandability of two-dimensional solutions,[25–27] we adopt a two-dimensional representation. The first two factors are associated with 79.04 per cent of the variance in the data set. Figure 1 shows an asymmetric plot of the personality types and biotechnology firm brands.

Examination of Figure 1 shows 'ruggedness' and 'excitement' to lie at one end of the first factor with 'competence' at the other, while 'sincerity' and 'sophistication' lie at opposite ends of the second factor. Millenium, Merck Serono, and Chiron are all strongly related to 'ruggedness' and 'excitement'. Medimmune, owing to its distance from the origin, is very strong on 'competence' while Genzyme is less. Firms that lie in an angle from the origin between two personality traits are associated with both. Their distance from the origin again measures the strength of this association. For instance, Gilead is strong on both 'excitement' and 'sophistication' while Amgen is relatively weak on 'sophistication' and 'competence'. Biogenidec and UCB Group both rank highly on 'sincerity' and 'ruggedness'.

DISCUSSION

Our results show that that biotechnology firms communicate distinct brand personalities via their websites. As their websites are important tools that link them to other members of their networks,[1] it is important that biotechnology firms are aware of the images that are being used to communicate to these external parties, especially when this has consequences for their future funding of and collaboration with the firm. Based on the comprehensiveness of these sites (eg Genentech website consists of 764 pages of firm and product-related information), biotechnology firms are already investing considerable resources in developing their online presence. If these sites, however, fail to communicate the correct or appropriate image and personality of their brands, these investments may be, at best, wasted or, at worst, counterproductive.

The content analysis tools illustrated here can be of strategic assistance to managers in monitoring and managing the images and personalities being portrayed by their firms. By focusing on the words and sentences being used on their sites, managers can develop and emphasise particular brand personality attributes, or address instances where incorrect or unfavourable characteristics have been revealed. In addition, by constructing perceptual maps of themselves and other members in their network, managers are able to assess whether their brand personalities and images are in line with what is expected in the industry.[17]

LIMITATIONS OF THE STUDY

Possibly the biggest limitation of this study is the dictionary itself. Our study used the same dictionary applied in prior research (see Okopu *et al.*[3]), developed taking into account specific measures to reduce bias, and based on Aaker's[16] conceptualisation of brand personality as an assessment of the consumer's perceptions of a brand. A review of the synonyms used in the dictionary highlights possible conflicts between or practical connotative overlaps in terminology; specifically between those used to denote excitement (eg enterprising, risk, latest, state-of-the-art, brand new (and associated synonyms), innovative, rare, exclusive, and unique) and those that could equally be used to describe competence. Therefore, we advise managers wanting to use this tool to measure their firms' brand personalities to develop dictionaries that appropriately reflect the nature of the organisational environment.

As mentioned by previous research of this nature, the methodology simply enables the evaluation of the firm's communicated brand;

not how the brand personality is ultimately perceived by the members of the network.[3]

CONCLUSION

An assessment of the websites of the top ten biotechnology firms reveals that these firms communicate clear and differentiated brand personalities via their websites. The brand personalities conveyed are a function of the words and phrases that make up the site. The portrayed personalities may, however, be unrepresentative of the firm in reality or may not be what managers actually wish to reveal to the network. Ongoing assessment of the communicated brand image and personality should be conducted by managers to ensure that the firm is positioned accurately and favourably in the mind of the firms' stakeholders.

The application of content analysis methodologies[3] has obvious potential for managers in the biotechnology industry, where firms must communicate to their networks that they are various combinations of innovative, competent, intelligent, responsible, good risk assessors and managers, collaborative, and reliable.[30] Failure to communicate the appropriate characteristics could result in mistaken beliefs by other network members that the firm is an incapable or inappropriate development partner. By focusing on the content of the firm's websites, managers can, however, monitor and adjust their brand personalities to accurately reflect their characteristics, thereby ensuring their continued participation in the network.

FURTHER RESEARCH DIRECTIONS

As mentioned, we believe that it would be useful if the dictionary used in this and prior studies could be tailored for different industrial environments and different contexts. This would undoubtedly involve reviewing each of the current dictionary's synonyms for its appropriateness. Additional synonyms might need to be added and certain words, found to be inappropriate, might need to be removed.

Further research should also track the effects of communicating specific brand personalities online. Additional studies should be conducted to assess the longitudal consequences of brand personality on firm performance and network participation.

Acknowledgments

We are grateful to Daniel Papania for research assistance.

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