EMOTIONAL DESIGN APPLICATION TO EVALUATE USER IMPRESSIONS OF LIBRARY INFORMATION DESKS

Carmina Cortés-Villalba. Universitat Politècnica de València, Camino de Vera s/n, 46022, Valencia, Spain

Isidoro Gil-Leiva. Universidad de Murcia, Campus de Espinardo s/n, 30100, Espinardo, Murcia, Spain

Miguel Ángel Artacho-Ramírez. Universitat Politècnica de València, Camino de Vera s/n, 46022, Valencia, Spain

Abstract

To evaluate the quality of service it is crucial to know on which concepts such evaluations are made from the user point of view. To do this we applied differential semantics as an emotional design method. Moreover, we devised an equation to discover the influence that these concepts have in the acceptation of a service by users. Some 53 users evaluated the tangible elements of 28 library information desks. As a result, five latent concepts appeared: modern, welcoming, professional, simple, and accessible. The most influential concepts influencing willingness to interact at these library information desks were, in descending order: modernity, professionality, welcomingness and accessibility. Finally, a comparative semantic profile was made to show the perception differences between the most and the least desirable information desks. Understanding the concepts that users consider when evaluating information desks and their influence on user behavior can help designers improve overall service quality impressions.

1. Introduction

Customer satisfaction is a crucial component that needs to be measured for any organization. Library user satisfaction depends on the quality of service and is an important measure of the service quality provided by a library. Obviously, users are satisfied when their service requirements are fulfilled. However, traditional performance measures of library services as "rich collection", "variations in material" and "number of users" are insufficient (Dahan et al., 2016). The traditional key principle of "the right information, to the right user at the right time" seems to be insufficient as user demands

are changing quickly in the information age. As consumers are becoming increasingly demanding, performance measurements of goal-oriented activities need to be completed with an analysis of affective and hedonic demands (Ladhari et al., 2017). To fulfil customer requirements, it is necessary to understand customer expectations and perceptions. It is well known that a perceived high level of service quality leads to a satisfactory relationship with customers and fosters greater customer-company identification, which eventually leads to loyalty and recommendation (Su et al., 2016). As shown by Nelson et al. (2004), user perceptions of quality could have an economic impact of between 17-27 per cent on earnings, net revenue, and return on assets. It is worth stating that the quality of a service is not something offered by the service provider, but is something subjectively perceived by the user.

Many authors (Gaur et al., 2014; Ng and Russell-Bennet, 2015) have recognized the influence of perceptions and emotions triggered by products and services on customer behavior. At present it is well known that customer behavioral intentions are determined by the cognitive and emotional evaluations of customers (Gracia et al., 2011). So customer behavior is formed through a combination of cognitive and emotional factors. It can be said that customer emotions and cognitions eventually have a significant influence on service quality evaluations (Kim et al., 2016).

The number of dimensions to be considered when evaluating service quality depends on the sector, scope, and purpose of the study. However, three dimensions have been traditionally considered for libraries: service affect (empathy, responsiveness, assurance, reliability); library as a place (utilitarian space, symbol, refuge); and information control (content/scope, convenience, timeliness, and ease of navigation) (Natesan and Aerts, 2016). Considering this framework, this study aims at contributing to improving service quality in libraries by covering the 'library as a place' dimension. The goal is to understand the latent concepts that library users keep in mind when evaluating the tangible elements of information desks, and the concepts that impact on the final approach/avoidance behavior.

2. Problem statement

There are several methods and tools for measuring the quality of services that analyze multiple service dimensions (SERVQUAL, SERVPRF, libQUAL, etc.). Most of these

methods analyze the perception triggered by the tangible elements of a service in a user centered design approach. However, these methods entail the following inconveniences:

- service quality evaluations consider few cognitive/emotional attributes, or are made in a one dimensional way – considering that multiple factors representing cognitive and emotional responses can be reduced as a single dimension (satisfaction) (Kim and Park, 2016).
- when setting the perceptive/emotional attributes to be evaluated only expert criteria are taken into account. Thus, evaluations are made on a discretionary basis without knowing which image and concepts are conveyed to service users.
 Existing methods question user perceptions of tangible elements of a service without first identifying which aspects users consider when evaluating them.

To solve these problems, the differential semantic method (DS) (Osgood et al, 1957) is used to set the underlying concepts and emotions in a multi-dimensional approach, filling the gap between the messages that are supposed to be conveyed to users and the messages that users really want to perceive. By doing so, designers can discover which affective attributes and concepts users latently consider when perceiving library information desks. In addition, we will be able to establish the influence of these concepts on the final decision by users to talk with library staff. The results may help service designers transmit the messages and concepts that users want and so improve perceived service quality.

3. Literature review

3.1 Service quality assessment

The term quality could be defined as superiority or excellence. Thus, perceived quality could be defined as the consumer's judgement about the superiority or excellence of a product or service. Steenkamp (1989, p.100) defined service quality as "an overall judgment that is based on the perception of the object (or product) on the quality attributes". The relevance of such quality attributes varies between different types of products and services. Thus, experts try to group quality attributes into more abstract and broad dimensions to deal with quality in a more general way. For instance, Garvin (1988) determined quality in eight dimensions (performance, features, reliability, conformability, durability, serviceability, aesthetics and perceived quality), and Brucks (1985) used six dimensions (ease of use, functionality, performance, durability,

serviceability, and prestige). Experts on service marketing agree that customers mostly base their judgments about quality on two dimensions: technical and functional (Grönroos, 1984). The former refers to what a customer actually receives from the service (the outcome), and the later refers to the way a service is delivered to a customer or the customer's perception of the interaction during a service (process). Recently published studies have evaluated both dimensions (Chen and Cheng, 2012; Tam, 2012), but the majority of works focus on the functional dimension (Giovanis et al., 2014). Addressing the functional dimension, Parasuraman et al. (1985) found five dimensions of perceived quality across four consumer service industries: reliability; empathy; assurance; responsiveness; and tangibles. The authors developed SERVQUAL as a tool to measure the gap in the five aforementioned dimensions for user expectations and user perceptions of the service provided (Parasuraman et al., 1988).

Many researchers who use SERVQUAL usually customize the original 22-item Likert scale survey according to their own objectives and service typologies, leading to derived standards such as: DINESERV (Stevens et al., 1995) for restaurants; SERVQHOS (Mira et al., 2009) for hospitals; E-S-QUAL (Gefen, 2002) for electronic service; and LibQUAL (Natesan and Aerts, 2016) for libraries, etc.

It is worth stating that in most SERVQUAL adaptations, the original dimension for evaluating the tangible elements of service has been simplified or completely removed. However, it is clear that the tangible elements present in service environments have an influence on in-store behavior, decision processes, approach or avoidance behavior, and user emotions and satisfaction (Babin et al., 2004; Ladhari et al., 2011; Michon et al., 2005; Heung and Gu, 2012). Therefore, in many services, as in the case of libraries, taking into account this tangible dimension can be crucial for improving the quality of service delivered.

3.2. Emotional engineering and service design

Emotional engineering tries to relate the attributes of products or services to the emotions they trigger in users (Nagamachi, 1995). It is important to note that there are two fundamental types of emotions: basic and secondary. Basic emotions consist of a fixed set of discrete categories generic to all human beings (Ortony and Turner, 1990). Examples of basic emotions could be happiness, sadness, anger, fear, disgust and surprise. Secondary emotions, which may come from more complex processes of

thinking than basic emotions, are domain-specific and individual-dependent emotions derived from primary emotions (Gaunt et al., 2002). Secondary emotions enable approaching emotional design in a multi-dimensional way by means of semantic spaces. Semantic space determination using the DS method has been successfully consolidated in the kansei engineering methodology (KE) (Nagamachi, 1995). KE has been mainly used for the emotional design of products, but in recent years it has been increasingly applied to services (Chen et al., 2015; Hsiao et al, 2016). However, the relationship between services and emotions has been analyzed more intensively in terms of basic emotions (positive and negative) in hedonic services (such as tourism, leisure, entertainment, and luxury services) in which users seek fun, satisfaction, distraction, or pleasure. The influence of a service environment in the basic emotions of shoppers has become a significant stream of research since Kotler (1973) coined the term "atmospherics" to describe the discipline of designing commercial spaces to produce specific emotional effects in consumers. By contrast, the role of emotions has been the object of fewer studies in utilitarian services (healthcare, banking, and dental services), where user consumption is more functional, instrumental, and goal-oriented. However, the work of Ladhari et al. (2017) and Rychalski and Hudson (2017) confirms the significant role played by emotions in utilitarian service settings.

Library services have usually been analyzed from a utilitarian perspective, as library services are intended to be used in the traditional instrumental sense of an information service (Buckland, 1986). Despite some exceptions (see Julien et al., 2005), library and information science (LIS) still pays little attention to the influence of emotions on the delivery of its services (Lopatovska and Arapakis, 2011). However, emotions are crucial in social interactions and in every decision-making process – and influence the customer service experience and customer behavior in both hedonic and utilitarian settings (Babin et al., 1994; Chan et al., 2015).

This paper aims at defining the emotional space of library information desks to establish the user perceived quality of its tangible elements and its influence on the eventual approach-avoidance user behavior.

4. Methods

The work was carried out in three phases:

1. Identification of the information desk semantic space (IDSS).

- 2. Influence of the IDSS dimensions on willingness to interact at information desks.
- 3. Semantic profile representation comparing perception differences between the most and least desirable information desks.

4.1 Identification of the IDSS

The objective was to identify the cognitive and affective dimensions that constitute the IDSS. This would let designers know the main concepts that users considered when performing the aesthetic, semantic, symbolic, and emotional appraisal of this spatial arrangement in a library.

4.1.1. Word selections: from the initial semantic universe (ISU) to a reduced semantic universe (RSU) of information desks.

The definition of the IDSS was performed according to guidelines given by Alcántara et al. (2005) when applying DS. The first step in obtaining the semantic concepts was to gather all the adjectives and expressions used by people to express their perception of information desks, thereby obtaining the ISU. To do this, 23 users (aged between 12 and 65 and balanced in genre) were interviewed, and interior design publications and the main information desk manufacturer websites were consulted. Only Spanish words were compiled. Interviewees were asked to consider information desks in any environment or entity where they find them (banks, shopping malls, airports, libraries, etc.) and provide adjectives to express whatever they see or feel when evaluating such spaces.

Three experts in product semantics reduced the collected words and expressions to a smaller set (RSU) to avoid loss of reliability due to subject tiredness during the evaluation phase. It is common for semantic evaluation to use between 40 to 100 words (Tanoue et al., 1997). The goal for this work was established as between 30 and 50 words. The selection criteria were to keep the most common adjectives and expressions, but discard synonyms and antonyms, as well as adjectives related to materials, specialized terms, and expressions indicating purpose or aim (Jindo et al, 1995). Only adjectives evaluating the information desk as a place were considered.

4.1.2. Images of information desks evaluated with RSU

To establish the perception triggered by a sample of information desks we used pictures of real information desks as stimuli. Some 84 images were obtained from various sources – including pictures taken in public libraries in the city of Valencia, and pictures from design and architecture webs showing information desks from various environments and entities. Finally, 28 pictures were selected showing various information desk arrangements. The pictures show library information desks as well as reception desks from other places to expand and enrich the sample stimuli and concept conveyance. All of the pictures were taken from the same angle, were well-lit, and did not show people queuing.

4.1.3. Survey procedure

Perception analysis was conducted in four group sessions lasting approximately 45 minutes. Fifty-three users (26 men and 27 women aged between 20 and 65) took part in the study. The users were given the standard instructions for DS questionnaires (Osgood et al., 1957) and were allowed up to two minutes per image to make evaluations. The subjects sat in a room where pictures of the information desks were projected on a large screen. The individuals evaluated the information desks following a completely arbitrary order. The terms selected were arranged in the form of statements (e.g. "This information desk is *functional*") and people answered on a five point-Likert scale as they agreed or otherwise with the statements. The questionnaire also included an item about the willingness to interact with staff at the information desk ("Would you like to interact at this information desk?"), with "yes" or "no" being the possible answers. Users were given one of 53 different versions of the self-report questionnaire to prevent an ordering effect of statements. The participants were allowed to rest if needed to avoid tiredness influencing the results.

The 1484 self-questionnaires (28 information desks x 53 subjects) each consisting of 33 statements, were coded according to the assigned numbers (2 = completely agree; 1 = agree, 0 = indifferent; -1 = disagree; -2 = completely disagree).

Data obtained was submitted to a principal component analysis (PCA) with varimax rotation to group the adjectives by dimensions. The criteria used to select the PCA solution were: the Kaiser-Meyer-Olkin test (KMO) was greater than 0.8; the components obtained were easy to interpret; that they accounted for a high global variance (>60%); and yielded eigenvalues greater than 1 after rotation; and that the communality of each variable presented values above 0.6 (Artacho et al., 2008).

The score of each variable for each axis was obtained by regression and to check the reliability and consistency of the axes, Cronbach's alpha coefficient was calculated.

4.2. Influence of the semantic concepts in the willingness to interact at the information desks.

The dimensions of the IDSS identified in Section 4.1 were assessed by analyzing their influence on user answers about their intention to interact with staff at information desks.

Binary logistic regression analysis was made – with user willingness to interact as a dependent variable and factor scores of IDSS dimensions as independent variables. The forward Wald procedure, as well as the Hosmer-Lemeshow test, and the R^2 of Nagelkerke were used to assess goodness-of-fit and percentage of variance. Finally, the equation for the probability of having an intention to be assisted was obtained.

Ten per cent of cases were randomly selected for a validation test of the predictability of the model produced by the analysis.

4.3. Semantic profile representation to compare concept conveyance between the most and the least desirable information desks.

Using the equation obtained in section 4.2 and the mean perception achieved by every information desk with IDSS dimensions, we calculated the probability of the willingness to interact at each information desk. The perceptional differences between the most and the least desirable information desks were then analyzed using the compared semantic profile (CSP). CSP is a graphical representation of the mean subject perception of the two information desks for each IDSS dimension, together with percentiles 5 and 95 of the subject perception means of the sample used to identify the IDSS. In addition, this chart presents the results of an ANOVA for each concept using information desk as a factor. Differences were considered statistically significant for p<0.05. The chart shows the least significant difference (LSD test) intervals of confidence for the mean of each alternative for each axis to reveal significant differences. Statistically significant differences exist when intervals do not overlap.

5. Findings

5.1. Identification of the IDSS.

Some 109 adjectives compiled from various sources were collected for the ISU, see Annex 1. They were reduced to 33 to constitute the RSU (Table 1).

Accessible	Accesible	Elegant	Elegante	Showy	Llamativo
------------	-----------	---------	----------	-------	-----------

Advanced	Vanguardista	Exclusive	Exclusivo	Simple	Sencillo
Attractive	Atractivo	Functional	Funcional	Sober	Sobrio
Boring	Soso	Good quality	De calidad	Technological	Tecnológico
Clean	Limpio	Modern	Moderno	Tidy	Ordenado
Clear	Diáfano	Obsolete	Anticuado	Updated	Actualizado
Close	Cercano	Original	Original	Visible	Visible
Cold	Frío	Overloaded	Recargado	Welcoming	Acogedor
Colorful	Colorido	Pleasant	Agradable	Well signposted	Bien señalizado
Comfortable	Cómodo	Pleasing	Vistoso	Well-appointed	Bien equipado
Dynamic	Dinámico	Professional	Profesional	With personality	Con personalidad

Table 1. RSU for information desks (original Spanish words in bold).

After PCA analysis, five principal components were selected that accounted for more than 61.5% of total variance. The KMO value was 0.958. Table 2 shows each semantic dimension, the main variables that integrate them with the correlation coefficient between each variable and the dimension in brackets, the percentage of the total variance explained for each, and Cronbach's alpha coefficient.

	Variables (correlation)	% of variance explained	Cronbach's alpha
D1	Advanced (0.882), Original (0.872), Modern (0.848), Exclusive (0.820), Showy (0.799), Attractive (0.794), Obsolete (-0.785), Updated (0.779), Technological (0.767)	36.711	0.765
D2	Welcoming (0.764), Pleasant (0.718), Close (0.616), Cold (-0.590)	8.088	0.741
D3	Well-signposted(0.774),Well-appointed(0.657),Professional (0.592),Comfortable (0.591),Visible (0.463)	6.748	0.815
D4	Simple (0.582), Sober (0.578), Overloaded (-0.446), Tidy (0.418)	5.019	0.863
D5	Clear (0.545), Functional (0.458), Accessible (0.423)	4.534	0.758

Table 2. Semantic dimensions; variance explained for each dimension and Cronbach's alpha coefficient.

Each semantic dimension that integrates the structure is explained below:

- D1 *Modern*: refers to the perception of modernity, originality, attractiveness, and uniqueness and is negatively correlated with an obsolete impression.

- D2 Welcoming: refers to how welcoming and friendly the information desk is perceived.
- D3 *Professional:* refers to the transmission of professionalism, considering how well the information desks ae equipped and signposted.
- D4 *Simple*: refers to the sober, simple, and neat image that an information desk gives.
- D5 *Accessible:* is the functional axis referring to the accessibility and openness offered by the information desk space.
- 5.2. Influence of the semantic concepts in the willingness to interact at information desks.

Binary logistic regression analysis produced a model in which, excluding *Simple*, all dimensions are statistically significant. Table 3 shows the coefficients (B) as well as the odds ratio (Exp. B) for the significant dimensions. The odds ratio is the constant effect of one dimension on the likelihood that a willingness to interact will occur (holding other independent dimensions constant). Nagelkerke's R² is 0.58 and the Hosmer-Lemeshow test is not statistically significant (showing a good fit of the model).

Concept	В	Exp(B)
Modern	1.25	3.502
Welcoming	1.10	3.007
Professional	1.17	3.229
Accessible	0.41	1.509

Table 3. Logistic regression coefficients (B) and odds ratio (Exp (B)).

Results can be seen in Equation (1):

Prob. of willingness to interact= $1/(1+e^{(-0.98-1.25 \text{ x modern}-1.10 \text{ x welcoming}-1.17 \text{ x professional}-0.41 \text{ x accessible})$ (1)

The classification test showed an average predictability of 83.1% in the analysis and 75.6% for the validation cases.

5.3. Semantic profile representation comparing the dimensional differences between the most and the least desirable information desks.

The results of the perception comparison between information desks 10 and 14 (see Figure 1) are depicted in Figure 2. There were significant differences in the perception of information desks in all but one dimension: *accessible*.



Figure 1. ID 1.0 (left) and ID 14 (right)

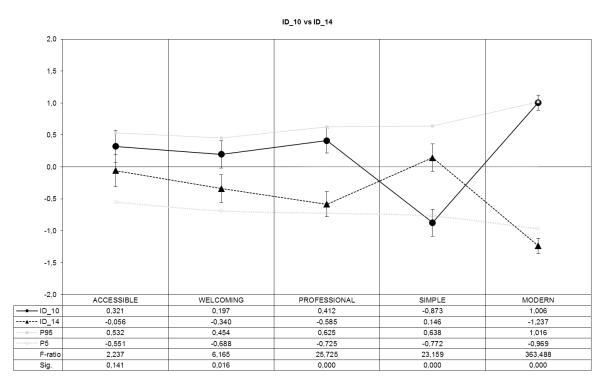


Figure. 2. Compared semantic profile between information desks 10 and 14.

6. Discussion

The results of this work presents DS as a useful method to discover the key affective dimensions that users keep in mind when they evaluate library information desks. Many researchers (Zeithaml, 1988) have underlined the importance of improving perceived quality of service attributes by going beyond the views of managers (who are mainly focused on objective quality dimensions – such as specifications and performance) and considering user views and perceptions. Moreover, an analysis of affective user responses in multiple dimensions without reducing the responses to a single factor (i.e. "overall satisfaction") leads to a better understanding of user intentions and reactions (Kim and Park, 2016).

It is important to stress that the obtained dimensions measure the cognitive answers (aesthetic, semantic, and symbolic evaluation) and the affective answer in terms of secondary emotions (Gaunt et al., 2002). This fact makes these dimensions appropriate for measuring quality – as they embrace this abstract and multi-dimensional concept from the analysis of tangible attributes to the "emotional payoff" through previous considerations of functional and practical benefits (Young and Feigin, 1975). The dimensions are also in line with the Lutz (1986) conception of quality in two pillars: "affective quality" (related to the overall evaluation after an experience) and "cognitive quality" (related to the assessment of service tangible attributes as the simplest level of abstraction).

Most studies of service quality measurement dismiss tangible elements; and when considered, only a few of the general dimensions established by researchers are used. Cleanliness, comfort, and security are generally among the most common tangible elements considered in service settings (Morton et al., 2016; Tosun et al., 2015; Pantouvakis and Renzi, 2016). Other attributes frequently used could be easy to find and up-to-date equipment (Bezerra and Gomes, 2016; Choi et al., 2004). In a recent study of user perceptions of academic library service quality, the LibQUAL model was applied limiting tangible elements to cleanliness and comfort of the library, along with clearness of directional signs (Dahan et al., 2016). However, a more in-depth analysis seems necessary to deal with tangible service attributes, as they convey messages that can elicit emotional responses from users and determine final acceptance.

This study shows that five specific dimensions can describe the cognitive and emotional appraisal of information desks in libraries. These dimensions go further than the general attributes commonly measured. Modern is a concept broader than simply considering up-to-date equipment, as it includes spatial arrangement and décor evaluations. Welcoming goes beyond basic demands of comfort or cleanliness, and is related to positive sensations and emotions that the information desk could elicit in users at first glance. Professional is a symbolic concept that helps give a desirable image of the library. Simple and accessible could be related to the Gibson semantic concept of "affordances" (Gibson 1977), in which a product or arrangement communicates to users the functions it performs and how they should be interacted with. Moreover, the accessible dimension evaluates space layout while considering the possibilities of interacting with people with the widest range of abilities.

The validity of the five-dimension IDSS was supported by the accomplishment of requirements set in section 4.1.3. In addition, in the analysis of internal consistency for each factor using Cronbach's alpha coefficient, all the dimensions obtained reliability values above 0.7 (the lowest threshold considered as acceptable that assures the dimensions used are reliable and satisfactory (Nunnally1978)).

These five dimensions have been used to discover their influence in the final approach or user avoidance behavior. The results of binary logistic regression were used to produce an equation to estimate the probability of obtaining 'Yes' as an answer to the question 'Would you like to interact at this information desk?'. The factors that positively influenced in the willingness to interact were (in descending order): modern, professional, welcoming, and accessible. The factor simple did not have any significant influence on user behaviors, probably because most of the information desks in the selected sample were simple and tidy when they were photographed. Libraries managers can use this equation to assess and improve attractiveness for interactions. Once managers know the value obtained by their libraries in each dimension (rating from -2 to 2), and the resulting probability of user willingness to interact using equation 1, they can strategically establish which dimensions should be changed to improve the probability.

The most and the least desirable information desks were identified using equation 1. The comparative semantic profile graphically reveals the perception results. Despite not showing statistically significant differences for accessible, desk 10 reached highly positive values in all significant dimensions (near to P95 values for all dimensions). In contrast, desk 14 was perceived negatively in all significant dimensions, being the least modern desk in the sample, with a value under P5. Interestingly, desk 14 reached higher values for simple than desk 10, but as said before, simple has no significant influence on the regression model for willingness to interact.

The methods and techniques used in this present study have enabled an analysis of the cognitive and emotional appraisal of library information desks by users, as well as the intentions of users. However, previously mentioned methods suffer from some limitations. The application of DS requires time and some statistical expertise, and provides results that must be reviewed over time, especially if tangible elements can be influenced by fashion. Another issue to consider is that DS provides information about how the service setting is perceived, but tells us nothing about why it is perceived in this way. Further research should be undertaken to investigate the influence on the emotions triggered in users of the chosen tangible elements and the way they are arranged. Moreover, it is worth stating that we have only considered the spatial layout and facilities aesthetic of information desks. However, ambient factors (such as scent, lighting, temperature, music, etc.) and employee factors and rules of behavior are also linked with user emotions and behavior (Heung and Gu, 2012). Further research – including the analysis of all these factors together – seems necessary to gain insights into the influence of service atmosphere on user emotions and behaviors.

7. Conclusion

Differential Semantics has proven a useful method to evaluate the tangible elements of services in a multi-dimensional approach and from the user point of view. Differential Semantics results enable designers to discover the key cognitive and emotional dimensions used to evaluate the perceived quality of service environments. There were five dimensions for library information desks: modern, welcoming, professional, simple, and accessible. Excluding simple, all the dimensions have significant influence on the obtained equation that predicts user intentions to interact at information desks. This equation enables library managers to know which dimensional perceptions need to be modified to improve user image impression and the willingness to interact. Finally, the comparison of semantic profiles has proven to be a useful tool to graphically see the results produced by the Differential Semantic method.

References

- Alcántara, E., Artacho, M. A., Gonzalez, J. C. & Garcia, A. C. (2005). Application of product semantics to footwear design. Part I—identification of footwear semantic space applying differential semantics. *International Journal of Industrial Ergonomics*, 35, 713-725.
- Artacho-Ramírez, M. A., Diego-Mas, J. A. & Alcaide-Marzal, J. (2008). Influence of the mode of graphical representation on the perception of product aesthetic and emotional features: An exploratory study. *International Journal of Industrial Ergonomics*, 38, 942-952.
- Babin, B. J., Chebat, J. C. & Michon, R. (2004). Perceived appropriateness and its effect on quality, affect and behavior. *Journal of Retailing and Consumer Services*, 11(5), 287-298.
- Babin, B. J., Darden, W. R. & Griffin, M. (1994). Work and / or fun? Measuring hedonic and utilitarian shopping. Journal of Consumer Research, 20(4), 644-656.
- Bezerra, G. C. L., & Gomes, C. F. (2016). Measuring airport service quality: A multidimensional approach. Journal of Air Transport Management, 53, 85-93.
- Brucks, M. (1985). The Effects of Product Class. Knowledge on Information Search Behavior. *Journal of Consumer Research*, 12(1), 1-16.
- Buckland, M. K. (1986). Library Services in Theory and Context. Oxford: Pergamon press.
- Chan, W. Y., To, C. K. & Chu, W. C. (2015). Materialistic consumers who seek unique products: how does their need for status and their affective response facilitate the repurchase intention of luxury goods? *Journal of Retailing and Consumer Services*, 27, 1-10.
- Chen, C. F., & Cheng, L. T. (2012). A study on mobile phone service loyalty in Taiwan. Total Quality Management and Business Excellence 23, 807-819.
- Chen, M. C., Hsu, C. L., Chang, K. C. & Chou, M. C. (2015). Applying Kansei engineering to design logistics services: A case of home delivery service. *International Journal of Industrial Ergonomics*, 48, 46-59.
- Choi, K. S., Cho, W. H., Lee, S., Lee, H. & Kim, C. (2004). The relationships among quality, value, satisfaction and behavioral intention in health care provider choice: A South Korean study. *Journal of Business Research*, 57(8), 913-921.
- Dahan, S. M., Taib, M. Y., Zainudin, N. M. & Ismail, F. (2016). Surveying Users' Perception of Academic Library Services Quality: A Case Study in Universiti Malaysia Pahang (UMP) Library. *The Journal of Academic Librarianship*, 42(1), 38-43.
- Damasio, A. R. (1994). Descartes error: Emotion, reason, and the human brain. New York: Putnam/Grosset Press.
- Garvin, D.A. (1988). Managing Quality: The Strategic and Competitive Edge. New York: The Free Press.
- Gaunt, R., Leyens, J. & Demoulin, S. (2002). Intergroup relations and the attribution of emotions: control over memory for secondary emotions associated with the ingroup and outgroup. *Journal of Experimental Social Psychology*, 38, 508-514.
- Gaur, S. S., Herjanto, H. Makkar, M. (2014). Review of emotions research in marketing, 2002-2013. Journal of Retailing and Consumer Services, 21(6), 917-923.
- Gefen, D. (2002). Customer Loyalty in E-Commerce. Journal of the Association for Information Systems, 3, 27-51.
- Gibson, J. J. (1977). The theory of affordances. In R.E. Shaw & J. Bransford (Eds.), *Perceiving, Acting, and Knowing: Toward an Ecological Psychology* (pp. 67-82). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Giovanis, Apostolos N., Zondiros, D. & Tomaras, P. (2014). The antecedents of customer loyalty for broadband services: The role of service quality, emotional satisfaction and corporate image. *Procedia Social and Behavioral Sciences*, 148, 236-244.

- Gracia, E., Bakker, A. B. & Grau, R. M. (2011). Positive emotions: the connection between customer quality evaluations and loyalty. *Cornell Hospitality Quartely*, 52(4), 458-465.
- Grönroos, C. (1984). A service quality model and its marketing implications. *European Journal of Marketing*, 18, 36-44.
- Heung, V. C. S., & Gu, T. (2012). Influence of restaurant atmospheric on patron satisfaction and behavioral intentions. *International Journal of Hospitality Management*, 31, 1167-1177.
- Hsiao, Y. H., Chen, M. C. & Liao, W. C. (2016). Logistics service design for cross-border E-commerce using Kansei engineering with text-mining-based online content analysis. *Telematics and Informatics* [In press].
- Jindo, T., Hirasago, K. & Nagamachi, M. (1995). Development of a design support system for office chairs using 3-D graphics. *International Journal of Industrial Ergonomics*, 15, 49-62.
- Julien, H., McKechnie, L. E. F. & Hart, S. (2005). Affective issues in library and information science systems work: A content analysis. *Library & Information Science Research*, 27(4), 453-466.
- Kim, N. Y., & Park. J. W. (2016). A study on the impact of airline service delays on emotional reactions and customer behaviour. *Journal of Air Transport Management*, 57, 19-25.
- Kim, S., Park, G., Lee, Y. & Choi, S. (2016). Customer emotions and their triggers in luxury retail: understanding the effects of customer emotions before and after entering a luxury shop. *Journal Of Business Research*, http://dx.doi.org/10.1016/j.jbusres.2016.04.178, [In press].
- Kotler, P. (1973). Atmospherics as a Marketing Tool. Journal of Retailing, 49(4), 48-64.
- Ladhari, R. Souiden, N. Ladhari, I. (2011). Determinants of loyalty and recommendation: The role of perceived service quality, emotional satisfaction and image. Journal of Financial Services Marketing. 16(2), 111-124.
- Ladhari, R., Souiden, N. & Dufour, B. (2017) The role of emotions in utilitarian service settings: The effects of emotional satisfaction on product perception and behavioral intentions. *Journal of Retailing and Consumer Services*, 34, 10-18.
- Lopatovska, I., & Arapakis, I. (2011). Theories, methods and current research on emotions in library and information science, information retrieval and human-computer interaction. *Information Processing and Management*, 47, 575-592.
- Lutz, R. (1986), Quality is as Quality Does: An Attitudinal Perspective on Consumer Quality Judgments, presentation to the Marketing Science Institute Trustees' Meeting, Cambridge, MA.
- Michon, R., Chebat, J. C. & Turley, L. W. (2005). Mall atmospheric: the interaction effects of the mall environment on shopping behavior. *Journal Of Business Research*, 58(5), 576-583.
- Mira, J. J., Tomas, O., Virtudes-Perez, M., Nebot, C. & Rodriguez-Marin, J. (2009). Predictors of patient satisfaction in surgery. Surgery, 145(5), 536-541.
- Morton, C., Caulfield, B. & Anable, J. (2016). Customer perceptions of quality of service in public transport: Evidence for bus transit in Scotland. *Case Studies on Transport Policy*, 4, 199-207.
- Nagamachi, M. (1995). Kansei Engineering: a new ergonomic consumer-oriented technology for product development. *International Journal of Industrial Ergonomics*, 15, 3-11.
- Natesan, P. & Aerts, X. (2016). Can library users distinguish between minimum, perceived, and desired levels of service quality? Validating LibQUAL using multitrait multimethod analysis. *Library & Information Science Research*, 38(1), 30-38.
- Nelson, E. C., Rust, R. T., Zahorik, A., Rose, R. L., Batalden, P. & Siemanski, B. A. (2004) Do patient perceptions of quality relate to hospital financial performance? *Journal of Health Care Marketing*, *12*(4), 6-13.
- Ng, S. & Russell-Bennett, R. (2015). The role of affect in consumer evaluation of health care services. Health Marketing Quarterly, *32*(1), 31-47.

Nunnally, J.C. (1978). Psychometric Theory. New York: McGraw-Hill.

- Ortony, A., & Turner, T. J. (1990). What's Basic About Basic Emotions? Psychological Review, 97(3), 315-331.
- Osgood, C. E., Suci, C. J. & Tannenbaum, P. H. (1957). *The Measurement of Meaning*. Urbana: University of Illinois Press, 76-124.
- Pantouvakis, A., & Renzi, M. F. (2016). Exploring different nationality perceptions of airport service quality. Journal of Air Transport Management, 52, 90-98.
- Parasuraman, A., Zeithaml, V. A. & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49, 41 - 50.
- Parasuraman, A., Zeithaml, V. A. & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64, 12-40.
- Rychalski, A., & Hudson, S. (2017). Asymmetric effects of customer emotions on satisfaction and loyalty in a utilitarian service context. *Journal of Business Research*, 71, 84-91.
- Steenkamp, J. B. E. M., (1989). Product Quality: an Investigation into the Concept and How It Is Perceived by Consumers. Assen/Maastricht, Holland: Van Gorcum.
- Stevens, P., Knutson, B. & Patton, M. (1995) DINESERV: A tool for measuring service quality in restaurants. The Cornell Hotel and Restaurant Administration Quarterly, 36(2), 56-60.
- Su, L., Swanson, S. R. & Chen, X. (2016). The effects of perceived service quality on repurchase intentions and subjective well-being of Chinese tourists: The mediating role of relationship quality. *Tourism Management*, 52, 82-95.
- Suziyana Mat Dahan, S., Yusof Taib, Mohd, Mohd Zainudin, Nuzhaizan & Ismail, Fadzida. (2016). Surveying Users' Perception of Academic Library Services Quality: A Case Study in Universiti Malaysia Pahang (UMP) Library. *The Journal of Academic Librarianship*, 42(1), 38-43.
- Tam, J. L. M. (2012). The moderating role of perceived risk in loyalty intentions: an investigation in a service context. *Marketing Intelligence & Planning*, 30, 33-52.
- Tanoue, C., Ishizaka, K. & Nagamachi, M., (1997). Kansei engineering: a study on perception of vehicle interior image. *International Journal of Industrial Ergonomics*, 19, 115-128.
- Tosun, C., Bora Dedeoğlu, B. & Fyall, A. (2015). Destination service quality, affective image and revisit intention: The moderating role of past experience. *Journal of Destination Marketing & Management*, 4(4), 222-234.
- Young, S., & Feigin, B. (1975). Using the Benefit Chain for Improved Strategy Formulation. *Journal of Marketing*, 39, 72-74.
- Zeithaml, V. A. (1988). Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence. *Journal of Marketing*, 52, 2-22.

Accessible	Accesible	Funny	Divertido	Resistant	Resistente
Adaptable	Adaptable	Futuristic	Futurista	Safe	Seguro
Adapted	Adaptado	Glazed	Acristalado	Serious	Serio
Advanced	Vanguardista	Good quality	De calidad	Showy	Llamativo
Attractive	Atractivo	Нарру	Alegre	Simple	Sencillo
Austere	Austero	Harmonic	Armónico	Sober	Sobrio
Balanced	Equilibrado	In organic form	De forma orgánica	Sophisticated	Sofisticado
Bold	Rompedor	In simple ways	De formas simples	Spectacular	Aparatoso
Boring	Soso	Innovative	Innovador	Strong	Robusto
Bright	Luminoso	Integrated	Integrado	Technical	Técnico
Bright colors	De colores vivos	Interactive	Interactivo	Technological	Tecnológico
Careless	Desenfadado	Interesting	De interés	Tidy	Ordenado
Clean	Limpio	Large	Amplio	Timeless	Atemporal
Clear	Diáfano	Luxurious	Lujoso	Updated	Actualizado
Close	Cercano	Minimalist	Minimalista	User-friendly	De uso intuitivo
Closed	Cerrado	Modern	Moderno	Ventilated	Ventilado
Cold	Frío	Modular	Modular	Versatile	Versátil
Colorful	Colorido	Narrow	Estrecho	Visible	Visible
Comfortable	Cómodo	Natural	Natural	Welcoming	Acogedor
Common	Vulgar	Neat	Aseado	Well decorated	Bien decorado
Compact	Compacto	Neutral colors	De colores neutros	Well distributed	Bien distribuido
Complex	Complejo	Nice	Coqueto	Well finished	Bien acabado
Conventional	Convencional	Obsolete	Anticuado	Well lit	Bien iluminado
Cool	Guay	Of careful aesthetics	De estetica cuidada	Well located	Bien ubicado
Cosmopolitan	Cosmopolita	Of nice touch	De tacto agradable	Well organized	Bien organizado
Cute	Mono	Of noble materials	De materiales nobles	Well signposted	Bien señalizado
Different	Diferente	Open	Abierto	Well-appointed	Bien equipado
Discreet	Discreto	Ordinary	Ordinario	Width	Ancho
Durable	Duradero	Original	Original	With cold colors	De colores fríos
Dynamic	Dinámico	Out of style	Desfasado	With curved shapes	De formas curvas
Elegant	Elegante	Overloaded	Recargado	With personality	Con personalidad
Ergonomic	Ergonómico	Pleasant	Agradable	With straight shapes	De formas rectas
Exclusive	Exclusivo	Pleasing	Vistoso	With style	Con estilo
Feminine	Femenino	Practical	Práctico	With warm colors	De colores cálidos
Formal	Formal	Professional	Profesional	Youthful	Juvenil
Fresh	Fresco	Rational	Racional		
Functional	Funcional	Refined	Pulido		

APPENDIX. Initial semantic universe of information desks (original Spanish words in bold).