

CONSUMER UNDERSTANDING IN THE AGE OF ENTREPRENEURSHIP

USING EXPERIMENTAL PSYCHOLOGY AND ONLINE TESTING TO MASSIFY RESEARCH

Alejandro Salgado-Montejo • Carlos Velasco • Carolina Maya • Andy T. Woods • Charles Spence

ESOMAR

ESOMAR Office:

Atlas Arena, Azië Gebouw

Hoogoorddreef 5

1101 BA Amsterdam

Phone: +31 20 664 21 41

Fax: +31 20 664 29 22

Email: customerservice@esomar.org

Website: www.esomar.org

Publication Date: April 2016

ESOMAR Publication Series Volume S373 Latin America 2016

ISBN 92-831-0287-8

COPYRIGHT

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system of any nature, or transmitted or made available in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of ESOMAR. ESOMAR will pursue copyright infringements.

In spite of careful preparation and editing, this publication may contain errors and imperfections. Authors, editors and ESOMAR do not accept any responsibility for the consequences that may arise as a result thereof. The views expressed by the authors in this publication do not necessarily represent the views of ESOMAR.

By the mere offering of any material to ESOMAR in order to be published, the author thereby guarantees:

- that the author - in line with the ICC/ESOMAR International Code of Marketing and Social Research- has obtained permission from clients and/ or third parties to present and publish the information contained in the material offered to ESOMAR;
- that the material offered to ESOMAR does not infringe on any right of any third party; and
- that the author shall defend ESOMAR and hold ESOMAR harmless from any claim of any third party based upon the publication by ESOMAR of the offered material.

Published by ESOMAR, Amsterdam,
The Netherlands
Edited by: Deborah S. Fellow

ABOUT ESOMAR

ESOMAR is the essential organisation for encouraging, advancing and elevating market research worldwide.

With more than 4,900 members from over 130 countries, ESOMAR's aim is to promote the value of market and opinion research in illuminating real issues and bringing about effective decision-making.

To facilitate this ongoing dialogue, ESOMAR creates and manages a comprehensive programme of industry specific and thematic events, publications and communications, as well as actively advocating self-regulation and the worldwide code of practice.

ESOMAR was founded in 1948.

ABOUT ESOMAR MEMBERSHIP

ESOMAR is open to everyone, all over the world, who believes that high quality research improves the way businesses make decisions. Our members are active in a wide range of industries and come from a variety of professional backgrounds, including research, marketing, advertising and media.

Membership benefits include the right to be listed in the ESOMAR Directories of Research Organisations and to use the ESOMAR Membership mark, plus access to a range of publications (either free of charge or with discount) and registration to all standard events, including the Annual Congress, at preferential Members' rates.

Members have the opportunity to attend and speak at conferences or take part in workshops. At all events the emphasis is on exchanging ideas, learning about latest developments and best practice and networking with other professionals in marketing, advertising and research. CONGRESS is our flagship event, attracting over 1,000 people, with a full programme of original papers and keynote speakers, plus a highly successful trade exhibition. Full details on latest membership are available online at www.esomar.org.

CONTACT US

ESOMAR

ESOMAR Office:
Atlas Arena, Azië Gebouw
Hoogoorddreef 5
1101 BA Amsterdam
The Netherlands
Tel.: +31 20 589 7800

Email: customerservice@esomar.org
Website: www.esomar.org

CONSUMER UNDERSTANDING IN THE AGE OF ENTREPRENEURSHIP

USING EXPERIMENTAL PSYCHOLOGY AND ONLINE TESTING TO MASSIFY RESEARCH

Alejandro Salgado-Montejo • Carlos Velasco • Carolina Maya • Andy T. Woods • Charles Spence

INTRODUCTION

Consumer research (CR) is a premium product offering which often represents an unaffordable luxury for small companies. At first glance, the notion that CR is expensive may sound ridiculous; but taking into account that by far the greatest consumers of CR are large companies, it is perhaps unsurprising then that CR focuses largely on the needs, interests, and intentions of large companies. Small businesses, entrepreneurs, and start-ups are generally not able to afford CR agencies. This is unfortunate, given that the process of understanding consumer behaviour in relation to a given product or service is fundamental to the success of small companies which in turn are vital for reducing inequality and strengthening economic prosperity, innovation, and competitiveness (Acs, 2006; Acs and Amorós, 2008; Acs, Desai, and Hessels, 2008; Acs and Zeb, 2007; Galor and Michalopoulos, 2006; Wennekers and Thurik, 1999, see also Salgado-Montejo, Maya, and Isaza, 2013, for an analysis of entrepreneurship in Colombia).

History has taught us that great products can and often do come from small companies, where there does not need to be such an intensive and large investment of resources to generate true innovation. Take for example Skype, WhatsApp, Nest, Spider.io, Redwood Robotics, Meebo; all of the aforementioned companies were bought by bigger companies as a strategic move to acquire innovative developments. Still, the question remains as to how much better start-ups and small businesses could perform and compete in the marketplace if they had access to rapid, reliable, and inexpensive CR methodologies. With the latter in mind, it is fundamental to democratize the access of CR and one of the best ways to do so is via online research.

We identify three key issues that need to be addressed in order to be able to offer a mass-consumer online research service. First, it is necessary to develop standardized methodologies that can be implemented within, or better, across industries and categories. Second, there is a need to reduce the time required to plan, execute, and deliver meaningful (actionable) results. Third, there is a key need to find a way to cut down costs (while still maintaining quality) and offer a price that is accessible to entrepreneurs and small businesses. Our approach to tackling these three issues is, on the one hand, to utilize cutting-edge methods and paradigms from the field of experimental psychology which are, in general, more cost-effective than cognitive neuroscience methods (i.e., eye tracking, electroencephalography, and functional magnetic resonance imaging); these have been validated and used a wide range of contexts, can follow the scientific method, produce reliable results, and are easy to adapt to different interfaces. Doing so lets us utilise online technologies to minimize costs related to participant recruitment, travel expenses, infrastructure, logistics, and field work.

Furthermore, online testing also grants an immense power to small businesses and entrepreneurs; no matter the kind of company or their location they can access CR solutions and frame their product in a local and/or global context. Online research also offers increased automation of processes reducing time and costs as well as providing results at an unprecedented speed. This, of course, does not mean that offline research will become obsolete or irrelevant, but it does offer a whole segment of the economy the opportunity to test, evaluate, and plan the future of their business using evidence-based decision making.

BENEFITS AND DRAWBACKS OF ONLINE RESEARCH

The current state of affairs is that online research is in many ways on a par with that done traditionally offline (see Woods et al, 2015, for a tutorial review). For example, sensory research often requires millisecond accuracy, and this is now achievable via the internet (Crump, McDonnell, and Gureckis, 2013). Although the amount of *sensory* research that is being conducted online is still growing, a whole variety of cognitive/behavioural research has already been undertaken; indeed, much past research has been replicated online (e.g. Chetverikov and Upraviteley, in press; Crump, McDonnell, and Gureckis, 2013; Germine, Nakayama, Duchaine, Chabris, Chatterjee, and Wilmer, 2012).

There are also some advantages of online over traditional in-lab research. The first is that data collection is very rapid (as demonstrated in one of the case studies reported later on); the experiment design, data collection, and result delivery may all happen within a week. Second, whilst in-lab participants are typically from Western, Educated, Industrialized, Rich, and Democratic societies (or WEIRD, see Henrich, Heine, and Norenzayan, 2010) and do not represent humanity at large, online participants come from all walks of life (*The Economist*, 2012) and tend to fill a much wider age spectrum (e.g., Ipeirotis, 2010). Third, online data collection tends to cost less than field or on-site research. Participants are typically paid \$1.50 for a ten-minute study, which makes online research incredibly economical and allows us to collect large datasets inexpensively. Indeed, the recent uprising of different disciplines against small sample sizes in traditional offline research (see Bakker, van Dijk, and Wicherts, 2012; Button et al, 2013; Open Science Collaboration, 2015, for some examples) could readily be quashed by moving to research online. Fourth, another benefit of online research is the ease with which cross-cultural studies can be conducted. Whilst these are only some of the benefits, it is already possible to imagine the potential of online research for entrepreneurs. It can provide quick, reliable, inexpensive, and multi-target research for decision-making concerning brands, products, and services.

There are a number of potential caveats for conducting research online though. One concern is that online participants cannot be monitored in the same way as lab-based research and may try to 'scam the system'. Proper checks can help here. These include asking participants engaging questions to weed-out scammers, and to ensure the participants truly understand the task at hand (Crump et al, 2012; Germine et al, 2012), as well as checking whether any of the participants completed the study in an impossibly short time frame. Another effective solution, however, is to simply collect more data (Simcox and Fiez, 2014); note though that there is growing evidence that online participants perform just as well on traditional psychology studies compared to those doing the same studies off-line (Crump et al, 2012; Germine et al, 2012; Klein et al, 2014).

The major hurdle when it comes to conducting research online, at least as far as the sensory-related topics are concerned, is when the experimental design requires the participant to have the hardware in order to run the study (as is the case in many psychophysics experiments). However, good research can in many cases bypass this barrier and ensure that relevant questions are asked in the best way available. For instance, sophisticated hardware is not really much of a barrier for visual and sound based research as all computers come equipped with means of presenting such stimuli. However, such stimuli often need to be very consistent over participants, which is hard to achieve with, for example, different monitor sizes. Here is where a good experimental design is key to ensure that online research can indeed have the same reliability as offline study. For the particular case of monitor size, a way to deal with this issue is to adjust stimuli size according to the location of your participant's ocular blind spots — by knowing the average separation between people's eyes (64.7 mm for men), you can work out how many radians a given stimulus will occupy on the screen. In terms of audition, one could determine a participant's threshold for detecting auditory stimuli and use this 'mark' as a minimum volume for stimuli.

Unfortunately, although great strides are being made regarding hardware to stimulate an ever-increasing number of senses, there are some sensory modalities which remain too expensive to probe en-masse (at least for now). For example, there is a custom drinks dispensing machine that can be used for online studies and dispenses different tastes, which costs upwards of \$100.

Another way to get around such issues is to understand that expectations, both sensory and hedonic, play an important role in determining the experiences we have (Piqueras-Fiszman & Spence, 2015). Hence it is possible to utilise expectations (which are easy to assess online) in order to predict consumers' responses towards different products and product attributes, for example by using descriptions of sensory events rather than the event itself. This is not as farfetched as it seems! We have already conducted a number of studies on taste and flavour expectations as a function of different product packaging attributes which reliably shown similar results both offline and online (Velasco et al., 2014a, b; 2015a, b).

HUMAN-COMPUTER INTERFACES WILL CHANGE RESEARCH (AND THEY WILL DO IT FASTER THAN YOU THINK!)

The range of senses that can be stimulated by technology can be vastly increased by using smartphones. In a review, Miller (2012) stated, "*The question is not whether smartphones will revolutionize psychology but how, when, and where the revolution will happen.*" A list of sensors and stimulators available for research purposes (extended upon the list compiled by Miller) include, ambient light detection, touch screen, proximity sensors, GPS, compass, 3-axis accelerometers, 3-axis gyroscopes, barometers, even eye tracking in the latest Samsung handset (not to mention virtual reality).

We are only now starting to use smartphones in research and so far the main focus has been in understanding cognition and behaviour. For example Killingsworth (2012) reported a custom iPhone app that was developed to ask 5,000 people at random times during the day their current thoughts, feelings and actions and found an interesting positive association between mind wandering and unhappiness (see the Ted talk: Killingsworth, 2012). As with computers though, variations between devices can sometimes be problematic for research. Screen resolutions, screen-sizes and number of colours that can be presented all vary over handsets (unless of course you restrict your study, say, to one type of device such as the latest generation iPad). Ren, Woods, McKenzie, Ru, and Levitan (2012) fell afoul of this issue, with a study run on Android and iPod devices in various global locations to explore the colours participants associated with different odours. They found, in a control study, that participants using an iPod assigned colours to vegetable and plastic odours differently than participants using the Android device. Note that it is possible to control for such issues with a good experimental design and in some situations with statistics – the authors included 'handset' as a covariate. Indeed, finding an effect despite there being such differences in itself would be a more robust finding. Future developments (e.g., multisensory interfaces, virtual reality, augmented reality, and wearable technology) may, however, tackle some of the challenges we currently face when conducting studies online (Nijholt, 2014).

Taking into account the aforementioned points, it is possible to conclude that online research has much to offer to both existing and developing business. Below, we present a case study on packaging design with a new beer brand in Colombia, namely, *Malagüero*. For that purpose, we first introduce the literature on product packaging design and product expectations, and then move on to present the study we conducted with them in which different beer designs were tested before launching the product.

WHAT HAVE EXPERIMENTS TAUGHT US ABOUT BRANDING AND PRODUCT DESIGN?

UNDERSTANDING PACKAGING AESTHETIC FEATURES AND PRODUCT EXPECTATIONS

Packaging can be thought of as part of the identity of a brand. The impact of packaging on purchase intent, positioning, product identification, and even on the sensory properties of the product has been widely documented (e.g. Rundh, 2009). Packaging, then, is a key element in the success of many products and requires careful research in order to guarantee that it conveys the required marketing information and that it can engage the consumer. The challenge of designing packaging becomes even greater when the brand is faced with the launch of a new product. In the case of start-ups, it could be their first product and hence fundamental to their survival (or to secure the next round of investment).

One of the biggest challenges in packaging design is to ensure that the packaging conveys attributes that are congruent with the sensory properties and conceptual categories of the product (Spence, 2016; Velasco et al, 2014). If the expectations set by the packaging and the actual product differ greatly it is possible that consumers might feel dissatisfied or choose a different product since it does not meet their needs or expectations (Velasco et al, in press, though mismatched expectations, under certain circumstance and at least for well-known brands, may lead to positive experiences).

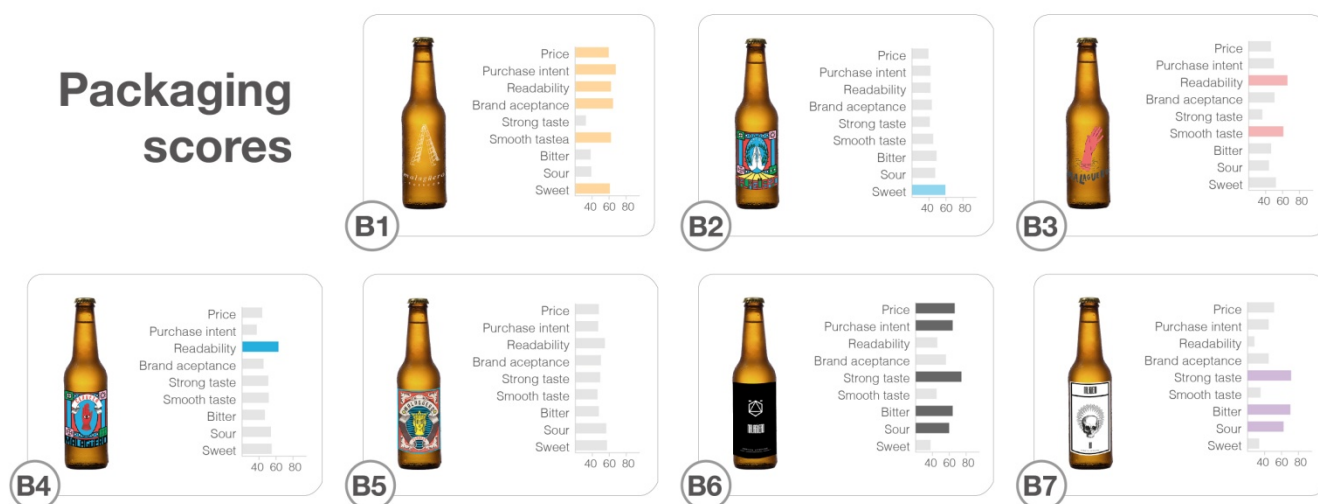
Using online research to evaluate beer packaging

In this particular case, we explored the expectations evoked by beer packaging of the Colombian brand *Malagüero*, which is launching its bottled beer in 2016. Specifically we evaluated the influence of the product packaging on the perceived price, purchase intent, readability of the design, and brand acceptance. These questions were included as their corresponding dimensions were critical to the product's attributes. We wanted to combine multisensory research and online testing to provide them with insights as to which packaging design would better convey their brand and product characteristics. Note that only a short summary of the results is presented here.

We evaluated the expectations of, and associations with, the product as a function of different packaging designs, based on 74 Spanish-speaking participants (female = 19, mean age = 25.6 years, STD: 6.6, range = 18-48). The experiment was programmed in Xperiment software which we developed at Flying Fish Research (<http://www.xperiment.mobi/>) and the participants were recruited using the Mechanical Turk online database. The participants were asked to review five different product packages (see figure 1B) and rate them in terms how cheap/expensive, whether they would buy the product, how easy it was to read the label, how much they liked the name of the brand, and how sweet, sour, bitter, soft, and strong they expected the product to be. The participants were presented with horizontal visual analogue (VA) scales ranging from 0 to 100 and anchor with 'not at all' on the left and 'very much' on the right.

Overall the packages that had the highest scores a greater number of categories were the bottle that presents a ladder above the brand (.B1) and the bottle displaying a hexagon that is circumscribing a triangle (B6); see figure 1.

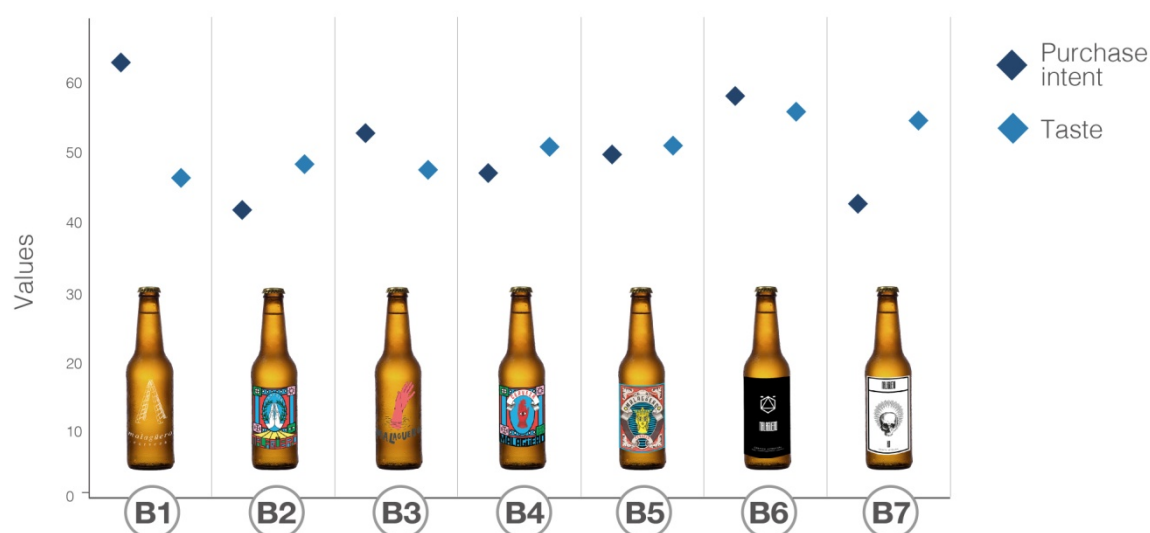
FIGURE 1. THE SCORES FOR EACH PACKAGING AND THE OVERALL RESULTS ON WHICH EACH ONE DID BETTER



The VAS scores suggest that features such as colour, composition (and balance), as well as the shapes present in the label can influence the expected taste of the beer. Less crowded designs displayed the highest scores for the price and purchase intent scales. Brand acceptance was an important attribute for the client given that the name of the product 'Malagüero' (bad omen) can have negative connotations. We found that, in general, the design with lighter/less saturated colours had the highest acceptance. Simpler visual designs appeared to positively influence brand acceptance. Regarding readability, it would seem that placing the brand name at the bottom and using high contrast colours (with respect to the background) yielded the best results (see figure 1).

A principal component analysis revealed that the dimensions measured (i.e., price, purchase intent, readability, brand acceptance, strong taste, smooth taste, bitter, sour, and sweetness) could be reduced to two main components, which we named 'Purchase intent' and 'Taste'. We collapsed the scores as a function of their correlation with each of the components. An average of these two categories revealed that B1 had the best performance in terms of purchase intent whereas B6 yielded favourable scores in both purchase intent and taste (see figure 2).

FIGURE 2. THE MEAN SCORES FOR EACH BEER IN TERMS OF PURCHASE INTENT AND TASTE (THE TWO CATEGORIES REVEALED AFTER CONDUCTING A PRINCIPAL COMPONENT ANALYSIS)



Based on the results presented here, Malagüero had the opportunity to choose the packaging that best fitted their pricing strategy, the flavour of their beer, and the image they want to convey for their brand. One of Malagüero's options was to choose one of the existing packages with minor or no modifications. Another option was to design a new packaging that

incorporates different attributes of the existing packages. It is never an easy task to modify or choose the best option, however, experimental research facilitates its articulation with previous findings. It is possible to use existing research to enhance the decision-making process at little or no cost. We would like to conclude with some simple guidelines (many of them derived from online research and all using experimental methods) that could be useful to entrepreneurs, marketers, and designers alike when thinking about product design (see figure 3).

FIGURE 3. EXAMPLES OF VISUAL FEATURES, THEIR EFFECTS AND PERCEIVED ASSOCIATIONS, AND SOME CORRESPONDING SCIENTIFIC EVIDENCE

Visual feature	Most commonly reported associations	Evidence
 Roundness	- Sweetness - Positive valence - Safety	Bar and Neta, 2006 Salgado-Montejo et al., 2014 Gómez-Puerto, Munar, and Nadal, 2015 Silvia and Barona, 2008 Vartanian et al., 2013 Velasco et al., 2014 Westerman et al., 2012
 Angularity	- Sourness - Negative valence - Danger	Velasco et al., 2015 Salgado-Montejo et al., 2015
 Symmetry	- Positive valence - Sweetness - Status - Higher price - Higher resources	Reber, Schwarz, and Winkielman, 2004 Salgado-Montejo, Velasco et al., 2015 Salgado-Montejo et al., forthcoming
 Asymmetry	- Sourness - Negative valence - Lower price	Salgado-Montejo, Velasco et al., 2015 Salgado-Montejo et al., forthcoming
 Complexity	- Sourness - Negative valence	Salgado-Montejo, Velasco et al., 2015
 Balance	- Positive valence	Berlyne, 1960 Salgado-Montejo, Tapia et al., 2015

There are many features that can influence the expectations about a product or brand. Aesthetics, art, and design have done an excellent job at harnessing this knowledge and applying it; currently, science supports many of the previous empirical findings and has provided clear guidelines. It is important to note, however, that no single feature is superior or “better” than another, rather the context together with specific combinations of features can influence in different ways how consumers perceive brands and their products. For example, in a particular context angularity and asymmetry may be associated with sourness and could be potentially misleading if the product is sweet and soft. In contrast, in the context of car design, angularity can convey power and aggressiveness (e.g., Lamborghini) which can actually be appealing to the consumer (cf. Carbon, 2010). Science cannot replace design but it can certainly work hand-in-and with, and aid, the process of product and service design.

CONCLUDING REMARKS

The way in which we perceive products and brands is at least in part determined by basic systems in the brain that are sensitive to patterns that in the past have played a key role in the survival of our species. Aesthetic appreciation and preference, then, might be the result (we might call it a beautiful accident) of our need to seek out patterns that increase our chances of survival. This remarkable ability to sort-out patterns evolved to be adaptive and flexible, facilitating its use even in situations, or contexts, that initially did not exist (e.g., walking around a supermarket, looking at a designer dress, or at an automobile). For example, we can, with similar skill, judge the beauty of a piece of art, a perfume bottle, or a human face (see Chatterjee, 2015, for a summary of the literature on aesthetics and the brain). Consumer preferences and judgments about products, then, are governed by this ancient system that never goes out of style. Behind our preferences and judgments about products lies a need to optimize, to seek-out the best possible option. All-in-all, aesthetics is not only about beauty but about value and vantage. In the context of consumer behaviour value and vantage are closely tied to price, pleasure, and status.

Since we are using old systems to uncover new patterns we can rely on the research of the last hundred years to understand how visual features influence how consumers might judge products. (See Batra, Seifert, and Brei, 2015 for a review on the influence on the psychology of design in the context of consumer behaviour, see also Palmer, Schloss, and Sammartino, 2013, for a review on visual aesthetics). Indeed it is possible to utilise experimental methods to understand and successfully predict the reactions that consumers may have towards products and brands. The short study we presented earlier underscores how a good experimental procedure, together with simple and flexible methodologies in an online setting, can provide useful and powerful insights that feed the design process and can increase the chances of survival of a product in a given market. What is more, online research may be one of the best tools not only to democratize consumer understanding but also to create a cost-effective and efficient method for cross-cultural research.

REFERENCES

- Acs, Z. (2006). How is entrepreneurship good for economic growth? *Innovations*, 1, 97-107.
- Acs, Z. J., and Amorós, J. E. (2008). Entrepreneurship and competitiveness dynamics in Latin America. *Small Business Economics*, 31, 305-322.
- Acs, Z. J., Desai, S., Hessels, J. (2008). Entrepreneurship, economic development and institutions. *Small Business Economics*, 31, 219-234.
- Acs, Z., and Szerb, L. (2007). Entrepreneurship, economic growth and public policy. *Small Business Economics*, 28, 109-122.
- Bakker, M., van Dijk, A., & Wicherts, J. M. (2012). The rules of the game called psychological science. *Perspectives on Psychological Science*, 7, 543-554.
- Bar, M., and Neta, M. (2006). Humans prefer curved visual objects. *Psychological Science*, 17, 645-648.
- Batra, R., Seifert, C., and Brei, D. (Eds.). (2015). *The psychology of design: Creating consumer appeal*. Abingdon, UK: Routledge.
- Button, K. S., Ioannidis, J. P.A., Mokrysz, C., Nosek, B.A., Flint, J., Robinson, E. S. J., & Munafò, M. R. (2013). Power failure: why small sample size undermines the reliability of neuroscience. *Nature Reviews. Neuroscience*, 14, 365-376.
- Bruno, N., Bertamini, M., and Protti, F. (2015). Selfie and the city: A world-wide, large, and ecologically valid database reveals a two-pronged side bias in naïve self-portraits. *PLoS ONE*, 10, e0124999.
- Carbon, C. C. (2010). The cycle of preference: Long-term dynamics of aesthetic appreciation. *Acta Psychologica*, 134, 233-244.
- Chatterjee, A. (2015). *The aesthetic brain: How we evolved to desire beauty and enjoy art*. New York, NY: Oxford University Press.
- Chetverikov, A., and Upravitelev, P. (in press). Online versus offline: The Web as a medium for response time data collection. *Behavior Research Methods*.
- Crump, J. C., McDonnell, J. V., and Gureckis, T. M. (2013). Evaluating Amazon's Mechanical Turk as a tool for experimental behavioural research. *PLoS One*, 8, e57410.
- Economist (2012). *Crowdsourcing is transforming the science of psychology*. <http://www.economist.com/node/21555876>
- Galor, O., and Michalopoulos, S. (2006). *The evolution of entrepreneurial spirit and the process of development*. CEPR Discussion Paper no. 6022. London, UK: Centre for Economic Policy Research.
- Germine, L., Nakayama, K., Duchaine, B. C., Chabris, C. F., Chatterjee, G., and Wilmer, J. B. (2012). Is the web as good as the lab? Comparable performance from Web and lab in cognitive/perceptual experiments. *Psychonomic Bulletin and Review*, 19, 847-857.
- Gómez-Puerto, G., Munar, E., and Nadal, M. (2015). Preference for curvature: A historical and conceptual framework. *Frontiers in Human Neuroscience*, 9:712.
- Henrich, J., Heine, S. J., and Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, 33, 61-135.
- Ipeirotis, P. (2010). *Demographics of Mechanical Turk*. <http://archive.nyu.edu/bitstream/2451/29585/2/CeDER-10-01.pdf>
- Killingsworth, M.A. (2012). *Want to be happier? Stay in the moment*. http://www.ted.com/talks/matt_killingsworth_want_to_be_happier_stay_in_the_moment.html

- Miller, G. (2012). The smartphone psychology manifesto. *Perspectives on Psychological Science*, 7, 221-237.
- Nijholt, A. (2014). Breaking fresh ground in human-media interaction research. *Frontiers in ICT*, 1:4.
- Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, 349, 4716-4716.
- Piqueras-Fiszman, B., and Spence, C. (2015). Sensory expectations based on product-extrinsic food cues: An interdisciplinary review of the empirical evidence and theoretical accounts. *Food Quality & Preference*, 40, 165-179.
- Reber, R., Schwarz, N., and Winkielman, P. (2004). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review*, 8, 364-382.
- Ren, J., Woods, A., McKenzie, K., Ru, L. X., and Levitan, C. A. (2012). Cross-cultural colour-odour associations. *Appetite*, 59, 634.
- Rundh, B. (2009). Packaging design: Creating competitive advantage with product packaging. *British Food Journal*, 111, 988-1002.
- Salgado-Montejo, A., Alvarado, J. A., Velasco, C., Salgado, C. J., Hasse, K., and Spence, C. (2015). The sweetest thing: The influence of angularity, symmetry, and the number of elements on shape-taste matches. *Frontiers in Psychology*, 6:1382.
- Salgado-Montejo, A., Hasse, K., Velasco, C., Mass, F., Salgado, C. J., and Spence, C. (in preparation). The allure of symmetry: How packaging shape influences the expected properties of perfumes.
- Salgado-Montejo, A., Maya, C., and Isaza, A. (2013). *Entrepreneurship as a key to innovation and sustainability in Colombia: Challenges, actors, impact*. Working paper, Bogotá: Fundación Bavaria (SABMiller). (Available in English and Spanish). Retrieved from <http://es.scribd.com/doc/189292476/Emprendimiento-E-Innovacion-F-Bavaria-2013>, 4/01/2016.
- Salgado-Montejo, A., Tapia Leon, I., Elliot, A. J., Salgado, C. J., and Spence, C. (2015). Smiles over frowns: When curved lines influence product preference. *Psychology and Marketing*, 32, 771-781.
- Salgado-Montejo, A., Velasco, C., Olier, J. S., Alvarado, J., and Spence, C. (2014). Love for logos: Evaluating the congruency between brand symbols and typefaces and their relation to emotional words. *Journal of Brand Management*, 21, 635-649.
- Silvia, P. J., and Barona, C. M. (2008). Do people prefer curved objects? Angularity, expertise, and aesthetic preference. *Empirical Studies of the Arts*, 27, 25-42.
- Spence, C. (2016). Multisensory packaging design: Colour, shape, texture, sound, and smell. In M. Chen & P. Burgess (Eds.), *Integrating the packaging and product experience: A route to consumer satisfaction*. Oxford, UK: Elsevier.
- Tomasello, M., Hare, B., Lehmann, H., and Call, J. (2007). Reliance on head versus eyes in the gaze following of great apes and human infants: The cooperative eye hypothesis. *Journal of Human Evolution*, 52, 314-320.
- Vartanian, O., Navarrete, G., Chatterjee, A., Fich, L. B., Leder, H., Modroño, C., Nadal, M., Rostrup, N., and Skov, M. (2013). Impact of contour on aesthetic judgments and approach-avoidance decisions in architecture. *Proceedings of the National Academy of Sciences of the United States of America*, 110, 10446-10453.
- Velasco, C., Michel, C., Youssef, J., Gomez, X., Cheok, A. D., and Spence, C. (in press). Colour-taste correspondences: Design food experiences to meet expectations or surprise. *International Journal of Food Design*.
- Velasco, C., Salgado-Montejo, A., Marmolejo-Ramos, F., and Spence, C. (2014a). Predictive packaging design: Tasting shapes, typographies, names, and sounds. *Food Quality and Preference*, 34, 88-95.
- Velasco, C., Wan, C., Knoeferle, K., Zhou, X., Salgado-Montejo, A., and Spence, C. (2015a). Searching for flavor labels in food products: The influence of color-flavor congruence and association strength. *Frontiers in Psychology*, 6:301.
- Velasco, C., Wan, X., Salgado-Montejo, A., Woods, A., Onate, G., Mi, B., and Spence, C. (2014b). The context of colour-flavour associations in crisps packaging: A cross-cultural study comparing Chinese, Colombian, and British consumers. *Food Quality and Preference*, 38, 49-57.
- Velasco, C., Woods, A., Deroy, O., and Spence, C. (2015b). Hedonic mediation of the crossmodal correspondence between taste and shape. *Food Quality and Preference*, 41, 151-158.
- Vishniakou, S., Lewis, B. W., Niu, X., Kargar, A., Sun, K., Kalajian, M., Park, N., Yang, M., Jing, Y., Brochu, P., Sun, Z., Li, C., Nguyen, T., Pei, Q., and Wang, D. (2013). Tactile feedback display with spatial and temporal resolutions. *Scientific Reports*, 3:2521.
- Wennekers, S., and Thurik, R. (1999). Linking entrepreneurship and economic growth. *Small Business Economics*, 13, 27-55.
- Westerman, S. J., Gardner, P. H., Sutherland, E. J., White, T., Jordan, K., Watts, D., and Wells, S. (2012). Product design: Preference for rounded versus angular design elements. *Psychology and Marketing*, 29, 595-605.
- Woods, A.T., Velasco, C., Levitan, C. A., Wan, X., and Spence, C. (2015). Conducting perception research over the internet: A tutorial review. *PeerJ*, 3:e1058.

THE AUTHORS

Alejandro Salgado-Montejo is founding member of Neurosketch and of Flying Fish Research and DPhil student at the Crossmodal Research Laboratory, University of Oxford, United Kingdom.

Carlos Velasco is founding member of Neurosketch and of Flying Fish Research and member of the Crossmodal Research Laboratory, University of Oxford, United Kingdom.

Carolina Maya is CEO of Neurosketch, United Kingdom.

Andy Woods is Founding member of Flying Fish Research and Head of Online Research at the Crossmodal Research Laboratory, University of Oxford, United Kingdom.

Charles Spence is Founding member of Flying Fish Research and Director of the Crossmodal Research Laboratory, University of Oxford, United Kingdom.