

Visual complexity versus visual simplicity: The effect of product presentation strategies on consumer meta cognitive experiences and purchase intentions

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Abstract

Brands adopt varying strategies to present their products online. Some use simple images, displaying products on a plain background, while others use complex images with contextual backgrounds. Recently, some brands have used incongruent contextual backgrounds. This paper examines the effectiveness of these strategies and the mediating effects of fluency. Three experiments demonstrate that simple images are more fluent than complex images (Study 1). Complex congruent (vs incongruent) images lead to higher (lower) levels of conceptual fluency and imagery fluency (Study 2), affecting purchase intentions mediated through fluency (Study 3). The paper makes several theoretical contributions and offers important managerial recommendations.

Keywords: *product presentation, fluency, purchase intentions*

1. Introduction

Brands use different visual stimuli to advertise their products and to enhance consumer purchase intentions. Some brands present their products on a plain background (e.g., Burberry), others adopt complex images displaying their products in a contextual background (e.g., Christian Louboutin) or complex incongruent images (e.g., Gucci), where the products are placed in an unfitting scene. However, which of these strategies influence consumers decisions remains a question unanswered. Thus, this paper aims to examine the effectiveness of different visual presentations (simple versus complex) on purchase intentions. It further examines the moderating influence of congruity on this relationship (complex congruent versus complex incongruent visual presentation).

To understand the mechanism through which visual presentation lead to purchase behaviour, it is worth noting that there are a number of cognitive and metacognitive processes taking place in consumers' mind prior behavioural intentions (Schwarz, 2021), and one of them is fluency. The way people process visual stimuli determine their purchase behaviour (Bhatia et al. 2022). People process visual stimuli first at a perceptual level, hence, crucial for visual information processing is perceptual fluency (the ease of perceiving the physical characteristics of the stimuli, Lee and Labroo, 2004). Individuals also tend to process the semantic meaning of the stimuli (i.e., conceptual fluency, Whittlesea, 1993) and engage in mental imagery (i.e., imagery fluency, Mandel, Petrova and Cialdini, 2006) of different stimuli. Employing a lens of fluency theory (Reber et al., 1994), this article also examines the the mediating role of varying fluency mechanisms (perceptual, conceptual and imagery fluency) that influence the relationship between visual presentation and purchase intentions.

2. Literature Review

2.1.1 Visual Complexity and Fluency

Fluency represents the “ease or difficulty with which new, external information can be processed” (Schwarz, 2004, p. 338). It is a metacognitive experience that accompanies every cognitive process (Alter and Oppenheimer, 2009). There are different types of fluency, however the main focus of this article will be on perceptual fluency, conceptual fluency and imagery fluency, as they are closely related to visual presentation.

Visual complexity depends on a number of perceptual dimensions, such as the quantity (Snodgrass and Vanderwart, 1980) and the variety (Heylighen, 1997) of objects, their symmetry and the picture arrangement (Reber, Schwarz and Winkielman, 2004; Mayer and Landwehr, 2014), the colours and the contrast between them (Leder and Carbon, 2005), familiarity with the scene, and the existing knowledge of the objects inside the scene (Oliva et al., 2004). Based on that, when a product is presented on a plain background, it should be considered as simple image, while when the same product appears within a contextual background, it should be considered as complex image. Both images (simple and complex) are processed differently and affect fluency in different ways.

Visual stimuli are processed first at a perceptual level. Perceptual fluency refers to the ease with which people process perceptual information (Lee and Labroo, 2004). Extant research informs that visual complexity (in comparison to simplicity) leads to decreased levels of perceptual fluency, due to the increased amount of information, which requires more time and cognitive effort for individuals to perceive and capture the presented information (Maier and Dost, 2018; Reber et al., 1998, 2004).

Visual processing also involves semantical understanding. Conceptual fluency represents the ease of processing the meaning and message of the presented stimulus (Whittlesea, 1993). Past literature suggests that when a stimulus is presented with a

contextual information, conceptual fluency increases, as the additional information enhances the understanding of the semantic meaning (Shapiro, 1999; Whittlesea, 1993). On the other hand, psychology research claims that when people are exposed to a complex scene, a number of schemas activate (Quillian, 1968; Collins and Loftus, 1975), which results in a number of possible interpretations (Gay, 1986); hence, understanding the semantic meaning and finding the “correct” one might be challenging when people are exposed to complex visual presentation. As processing fluency is characterised as effortless and error-free processing (Orth and Witz, 2014), it could be concluded that complex images would lead to decreased levels of conceptual fluency, in comparison to simple images.

Imagery fluency represents the ease with which people generate mental imageries, (Mandel, Petrova and Cialdini, 2006). Imagery fluency has received limited attention in terms of visual complexity, however Chang (2013) and Maier and Dost (2018), documented that complex images are more imagery fluent in comparison to simple images. On the other hand, past research has already established that complex stimuli require more cognitive effort for perceptual and semantic processing (Larsen et al., 2004, Reber et al., 2004). According to Alter and Oppenheimer (2009) all dimensions of fluency generate “...remarkably uniform judgements across a range of domains” (p., 220), therefore, we suggest that visual complexity would decrease imagery fluency. Also, visual complexity suggests the presence of a number of elements within the contextual background, which would influence a number of schemas related to different associations, experiences and memories (Mander, 1982, Barlett, 1932). They could lead to a “narrative transportation” (Green and Brock, 2000), that require a lot of cognitive effort. Based on the above-mentioned claims and past research findings, we propose that simple visual stimuli would increase the levels of imagery fluency.

Visual Congruity and Fluency

Visual congruity affects the way people process stimuli. It is concerned with the match between two or more elements (Rokeach and Rothman, 1965). Schema-congruity theory (Mandler, 1982) suggests that people encode schemas when they process a stimulus for a first time; and that individual’s memory consists of multiple schemas related to objects, people, knowledge, events, experiences, etc. These schemas enhance the ability of people to process information (Dickinson, 2011). In particular, if the presented information is consistent with those schemas, people are able to process it easier (more fluent), while if it is inconsistent, the processing is harder as it requires more cognitive effort. According to the fluency theory, if more cognitive effort is required, then the levels of fluency decreases. Based on that we propose that complex congruent images would be more perceptually fluent in comparison to complex incongruent images.

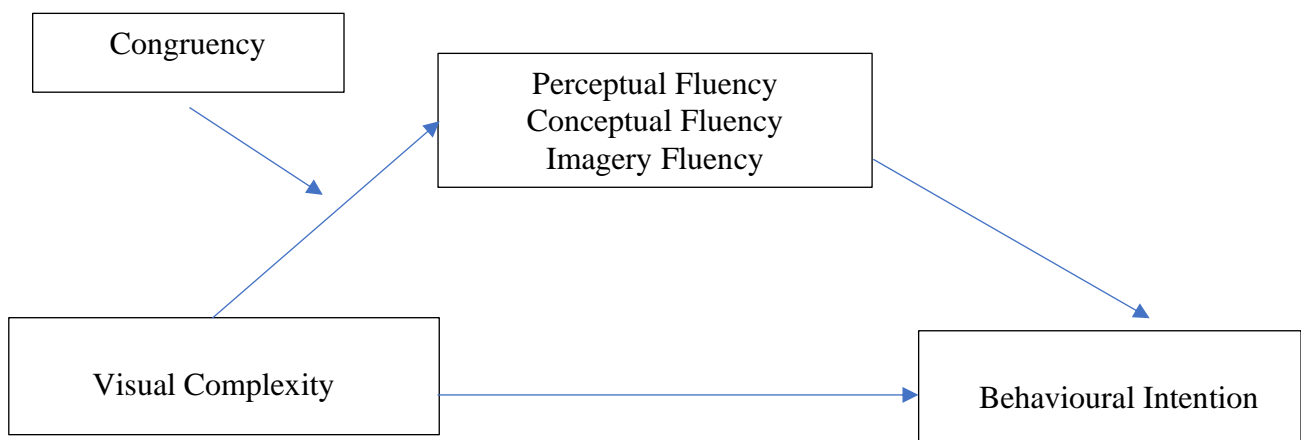
With regards to the effects of visual congruity on conceptual fluency, extant research confirms that congruity positively affects conceptual fluency in different contexts, such as character- product congruency (De Droog et al., 2012), banners congruency (Kao and Wang, 2013, Shen and Chen, 2007), picture-text congruency (Peracchio and Meyers-Levy, 2005), hotel banners congruency (van Rompay et al., 2010). Drawing upon the Schema-Congruity Theory (Mandler, 1982) and the previous research findings, we posit that complex congruent images would be more conceptually fluent in comparison to complex incongruent images.

The Schema-Congruity theory (Mandler, 1982) suggests that people store schemas, form expectations of where an object would appear and what a scene would portray. Hence, when exposed to a congruent scene, matching the expectations of where an object would appear, it would be easier for people to create mental imagery (Zhao et al., 2014). Therefore, we posit that complex congruent images would lead to higher levels of imagery fluency than complex incongruent images.

Visual Complexity, fluency and Purchase intentions

Scholars debate on the effects of visual stimuli on purchase intentions, where some claim that simple (Bigoin-Gagnan and Lacoste-Badie, 2018, Pelet, Durrieu and Lick, 2020), others that complex images (Yoo and Kim, 2014, Lee, Hur and Watkins, 2018 Pieters, Wedel and Batra, 2010) influence consumer purchase intentions. Drawing upon the above-mentioned hypotheses and on the previous research, suggesting the positive effects of processing fluency (Song and Schwarz, 2008, Storme et al., 2015) as well as imagery fluency (Levav and Fitzsimons, 2006, Petrova and Cialdini, 2005; Zhao, Hoeffler and Dahl, 2007) on purchase intentions, we posit that simple images will influence higher levels of perceptual, conceptual and imagery fluency, which in turn would lead to higher levels of purchase intentions.

Figure 1: Conceptual framework



3. Method

The study employs an experimental research design to investigate the effects of visual complexity (simple *versus* complex) and congruity (complex congruent *versus* complex incongruent) on fluency and consumer purchase intention. Study 1 tests the relationship between visual complexity and fluency. In that study the visual complexity was manipulated: some participants were exposed to the simple, others to the complex visual stimulus. Study 2 investigates, the moderating effects of congruity on the relationship between visual complexity and fluency. Visual complexity and congruity were manipulated, where some participants were exposed to a simple, others to a complex congruent (product placed in a matching contextual background), and the rest to a complex incongruent image (product placed in an unfitting contextual background). Study 3 investigates the effects of visual complexity on consumer purchase intentions as well as the mediating effect of fluency, where visual complexity was manipulated similarly to Study 1.

Each experiment follows the same procedure: participants were approached in public and asked to take part in a study investigating consumer behavior on social media. The survey begins with some socio-economic questions as well as some questions regarding their social media behavior. Then, they were exposed a random image (simple vs complex; complex congruent vs complex incongruent) and asked to rate the level of perceptual fluency on a 7-point bipolar using the following factors “cluttered-uncluttered”, “messy-neat”; “crowded-spacious”; “hard to view-easy to view” and “hard to perceive-easy to perceive” (Monstrell, Donthu and Eroglu, 2014). After that participants were asked to rate the levels

conceptual fluency, using the Wu et al. (2016) scale, where they had to rate on a 1-7 semantic differential scale the following statements: “The meaning of the image was easy to understand”, “The message of the image was easy to understand”, “The idea of the image was easy to understand”. They were also asked to rate the levels of imagery fluency on a 7-point Likert scale the following options “I had difficulty imagining the depicted image in my head”, “I quickly generated images of what was depicted in the image”, “I found it easy to imagine the depicted image” (Bone and Ellen, 1992). For study 3 only, the participants were asked to rate on a bipolar scale the possibility to purchase the displayed product in the future based on the following criteria “Unlikely - Likely”, “Impossible - Possible” and “Improbable – Probable” (Smith et al., 2007). At the end of each survey, the participants were debriefed with regards to the aim of the experiment.

3.1 Study 1

Study 1 aims to research the relationship between visual complexity (simple *versus* complex images) on fluency. ANOVA demonstrates that the simple images are significantly easier to process perceptually in comparison to complex images ($M_{\text{simple}}=5.48$; $SD=1.51$; $M_{\text{complex}}=4.23$; $SD=1.56$; $F(1, 103)=15.604$, $p=0.00$). The results confirm past research findings suggesting that visual complexity leads to decreased levels of perceptual fluency (Maier and Dost, 2018; Reber et al., 1998, 2004).

ANOVA also shows that simple images influence higher levels of conceptual fluency than complex images ($M_{\text{simple}}=4.89$; $SD=1.57$; $M_{\text{complex}}=3.95$; $SD=1.49$; $F(1, 103)=9$, $p>0.005$). In this way, the study contradicts the claim that due to the added information, complex stimuli are easier to understand semantically (Shapiro, 1999, Whittlesea, 1992). Therefore, the study adds to the fluency literature by providing an important information with regards to the relationship between visual complexity and conceptual fluency.

Finally, ANOVA confirms that simple images are more imagery fluent than complex images ($M_{\text{simple}}=5.22$; $SD=1.15$; $M_{\text{complex}}=4.47$; $SD=1.29$, $F(1, 103)=8.718$, $p>0.001$). The current study extends the knowledge on imagery fluency, by demonstrating that simple visual stimuli are easier to imagine, than complex visual stimuli. In this way the findings contradict Chang’s (2013) and Maier and Dost’s (2018) claim that visual complexity increase imagery fluency.

3.2 Study 2

Study 2 aims to investigate the moderating role of visual congruity on the effects of visual complexity and fluency. One-way ANOVA reconfirmed the results from Study 1 specifically that the simple images are significantly more perceptually ($M_{\text{simple}}=5.87$; $SD=1.43$; $M_{\text{complex}}=3.60$; $SD=1.61$, $F(1, 225)=109.758$, $p=0.00$), conceptually ($M_{\text{simple}}=5.12$; $SD=1.39$; $M_{\text{complex}}=3.59$; $SD=1.81$; $F(1, 225)=43.363$, $p=0.00$) and imagery fluent ($M_{\text{simple}}=5.11$; $SD=1.39$; $M_{\text{complex}}=4.48$; $SD=1.43$; $F(1, 225)=10.217$, $p=0.05$) than complex images.

In terms of congruity, ANOVA documents that the complex congruent image is more conceptually fluency than complex incongruent image ($M_{\text{congruent}}=4.39$, $SD=1.69$; $M_{\text{incongruent}}=2.84$, $SD=1.58$; $F(1, 147)=33.493$, $p<0.001$). The results confirmed the past literature findings illustrating that congruity increases conceptual fluency (Droog et al., 2012, Kao and Wang, 2013, Shen and Chen, 2007, Peracchio and Meyers-Levy, 2005, van Rompay et al., 2010).

The ANOVA results illustrate that complex congruent image influences higher levels of imagery fluency in comparison to complex incongruent image ($M_{\text{congruent}}=4.91$, $SD=1.43$; $M_{\text{incongruent}}=4.07$, $SD=1.31$; $F(1, 147)=13.925$, $p=.000$). This is an important contribution to the fluency literature. As mentioned previously, the research on imagery fluency is very

limited, hence the results on the study shed light on the effects of congruity on imagery fluency.

On the other hand, ANOVA shows that there is no significant difference between the levels of perceptual fluency for the complex congruent and complex incongruent images ($M_{\text{congruent}}=3.84$; $SD=1.67$; $M_{\text{incongruent}}=3.37$, $SD=1.53$) $F(1, 147)=3.178$, $p=.077$). It is important to note that both images are complex, therefore they would require more cognitive effort for processing, which explains the results.

3.3 Study 3

Study 3 aims to explore the relationship between visual complexity and purchase intentions as well as the mediating role of fluency. The ANOVA results reconfirm that simple images are more perceptual ($M_{\text{simple}}=6.19$, $SD=1.34$; $M_{\text{complex}}=4.29$; $SD=1.45$, $F(1, 196)=80.464$, $p>0.001$), conceptual ($M_{\text{simple}}=4.96$; $SD=1.48$; $M_{\text{simple}}=3.32$, $SD=1.64$; $F(1, 196)=47.41$, $p>0.001$) and imagery fluent ($M_{\text{simple}}=5.40$, $SD=1.09$; $M_{\text{complex}}=4.19$, $SD=1.48$; $F(1, 196)=35.690$, $p<.001$) than complex image.

Furthermore, Process Model 7 demonstrates that the effects of visual complexity on purchase intentions are not direct (effect = -0.07 , $SE=0.14$, $t=-0.55$, $p>0.05$; 95% CI, = $[-0.34$ to $0.19]$) but mediated by perceptual fluency [95% CI, $-.42$ to $-.12$], conceptual fluency [95% CI, $-.41$ to $-.15$] and imagery fluency [95% CI, $-.36$ to $-.13$]. Taken together, the results of Study 3 show that fluency mediates the effects of visual complexity on purchase intentions. Also, the findings confirm the positive link between processing fluency and behaviour intentions (Song and Schwarz, 2008, Storme et al., 2015) as well as imagery fluency on behavioural intention (Petrova and Cialdini, 2005; Zhao, Hoeffler and Dahl, 2007).

4. Discussion

The article examines the interactive effects of visual stimuli with varying levels of complexity and congruity on fluency and purchase intentions. The results revealed that simple images are more perceptually, conceptually and imagery fluent compared to complex images. In this way the study confirms the past research suggesting that visual complexity reduces perceptual fluency (Reber, et. al., 1998, 2004, Maier and Dost, 2018). Furthermore, this finding extends the past research, as the current topic explores the presence versus the absence of a contextual background (instead of focusing on a particular perceptual dimension).

The study contradicts past research claim that the contextual background enhances the understanding of the meaning of the visual stimuli (Shapiro, 1999, Whittlesea, 1992). The findings show that visual complexity reduces conceptual fluency. The study also demonstrates that simple images are more imagery fluent than complex images, which contradicts past research (Chang, 2013, Maier and Dost, 2018). In so doing, the current study extends the knowledge on imagery fluency by focusing on pictures presenting fashion products, unlike past research focusing on sketches of typical fashion products (Chang et al., 2018), or on experiential or augmented products (Maier and Dost, 2018).

Secondly, the study made a novel contribution to the literature by illustrating the moderating role of congruity on the relationship between visual complexity and different fluency types. Specifically, that simple images are still perceived as significantly more perceptual, conceptual and imagery fluent than complex images. On the other hand, the study shows that complex congruent images are more conceptual and imagery fluent than complex incongruent images. As the research on imagery fluency is very limited, this finding extended the knowledge on the effects of congruity on different dimensions of fluency. Also, the study confirmed that congruity positively affects conceptual fluency, and in this way

extends the past research focusing on different dimensions of congruity such as: character-product congruency (De Droog et al., 2012), banners congruency (Kao and Wang, 2013, Shen and Chen, 2007), picture-text congruency (Peracchio and Meyers-Levy, 2005), hotel banners congruency (van Rompay et al., 2010), by using a typical product (a fashion item) on a contextual background.

It is important to highlight, that the claim that different dimensions of fluency influence similar results (Alter and Oppenheimer, 2009) is not valid for the perceptual fluency and conceptual fluency and their interconnection to congruity. Therefore, those two types of fluency must be examined separately, not as “processing fluency”. This is an important contribution to the fluency literature as the majority of papers on fluency explore the ease of perceptual and semantical processing together.

Finally, the study deepens the knowledge on the effects of visual complexity on purchase intentions by demonstrating that perceptual, conceptual and imagery fluency mediate that relationship. These results also reconfirm the positive link between processing fluency and behaviour intentions (Song and Schwarz, 2008, Storme et al., 2015) by illustrating the individual effects of conceptual as well as perceptual fluency. Furthermore, the results confirmed that the imagery fluency positively influence purchase intention (Petrova and Cialdini, 2005; Zhao, Hoeffler and Dahl, 2007).

The study also offers several practical implications. To increase consumer purchase intentions, we recommend managers to utilize simple images, as they are easier to process perceptually, semantically and imagery. In the cases where this is not possible, then their communication should be based on complex congruent images as it is easier for consumers to semantically process and imagine the picture that is congruent to their stored schemas.

References

- Alter, A. L. & Oppenheimer, D.M. (2009). Uniting the tribes of fluency to form a metacognitive nation. *Personality and Social Psychology Review*, 13 (3), 219-235.
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge, UK: Cambridge University Press.
- Bigoin-Gagnan, A., & Lacoste-Badie, S. (2018). Symmetry influences packaging aesthetic evaluation and purchase intention. *International Journal of Retail and Distribution Management*, 46(11–12), 1026–1040.
- Bone, P. F. & Ellen, P. S. (1992). The generation and consequences of communication-evoked imagery. *Journal of Consumer Research*, 19(1), 93–104.
- Chang, C. (2013). Imagery Fluency and Narrative Advertising Effects. *Journal of Advertising*, 42(1), 54-68.
- Gay, G. (1986). Interaction of learner control and prior understanding in computer- assisted video instruction. *Journal of Educational Psychology*, 78 (3), 225.
- Green, M. C. & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology*, 79(5), 701–721.
- Heylighen F. (1999). “The Growth of Structural and Functional Complexity during Evolution”, in: F. Heylighen, J. Bollen & A. Riegler (eds.) *The Evolution of Complexity* (Kluwer Academic, Dordrecht), 17-44.
- Kao, C.-T., Wang, M.-Y. (2013). The right level of complexity in a banner ad: roles of construal level and fluency. In: Yamamoto, S. (Ed.), *Human Interface and the Management of Information. Information and Interaction Design Vol. 8016*. Springer, Berlin Heidelberg, 604–613.
- Larsen, V., Luna, D. and Peracchio, L.A. (2004). Point of view and pieces of time: a taxonomy of image attributes. *Journal of Consumer Research*, 32(1), 102-110.
- Leder, H. & Carbon, C. Ch. (2005). Dimensions of Appreciation of Car Interior Design. *Applied Cognitive Psychology*, 19 (5), 603-18.

- Lee, A. Y. and Labroo, A. (2004). Effects of conceptual and perceptual fluency on affective judgment. *Journal of Marketing Research*, 41 (2), 151-165.
- Lee, J. E., Hur, S., & Watkins, B. (2018). Visual communication of luxury fashion brands on social media: effects of visual complexity and brand familiarity. *Journal of Brand Management*, 25(5), 449 -462.
- Levav, J. & Fitzsimons, G. J. (2006). When Questions Change Behavior: The Role of Ease of Representation. *Psychological Science*, 17(3), 207–213.
- Mandel, N., Petrova, P. K. & Cialdini, R. B. (2006). Images of Success and the Preference for Luxury Brands. *Journal of Consumer Psychology*, 16(1), 57–69.
- Mandler, G. (1982). “The structure of value: Accounting for taste,” in *Affect and Cognition: The 17th Annual Carnegie Symposium*, eds. Margaret S. Clark and Susan T. Fiske, Hillsdale, NJ: Lawrence Erlbaum Associates, 3-36.
- Maier, E., and F. Dost (2018a). Fluent contextual image backgrounds enhance mental imagery and evaluations of experience products. *Journal of Retailing and Consumer Services*, 45, 207–20.
- Maier, E., and F. Dost. (2018b). The positive effect of contextual image backgrounds on fluency and liking. *Journal of Retailing and Consumer Services*, 40, 109–16.
- Mosteller, J., Donthu, N., & Eroglu, S. (2014). The fluent online shopping experience. *Journal of Business Research*, 67 (11), 2486–2493.
- Mayer, S. & Landwehr, J.R. (2014). When complexity is symmetric: the interplay of two core determinants of visual aesthetics. *Advances in Consumer Research*, 42, 608–609.
- Oliva, A., Mack, M. L., Shrestha, M., & Peeper, A. (2004). Identifying the perceptual dimensions of visual complexity of scene. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 26, 1041–1046.
- Orth, U.R. and Wirtz, J. (2014). Consumer processing of interior service environments: the interplay among visual complexity, processing fluency, and attractiveness. *Journal of Service Research*, 17(3), 1–14.
- Pelet, J. E., Durrieu, F. and Lick, E. (2020). Label design of wine sold online: Effects of perceived authenticity on purchase intentions. *Journal of Retailing and Consumer Services*, 55.
- Peracchio, L. A. and Meyers-Levy, J. (2005). Using Stylistic Properties of Ad Pictures to Communicate with Consumers. *Journal of Consumer Research*, 32 (1), 29-40.
- Petrova, P. K. & Cialdini, R. B. (2005). Fluency of consumption imagery and the backfire effects of imagery appeals. *Journal of Consumer Research*, 32(3), 442–452.
- Pieters, R., Wedel, M. and Batra, R. (2010). The stopping power of advertising: measures and effects of visual complexity. *Journal of Marketing*, 74, 48–60.
- Reber, R., Winkielman, P., & Schwarz, N. (1998). Effects of perceptual fluency on affective judgments. *Psychological Science*, 9 (1), 45-48.
- Reber, R., Schwarz, N. & Winkielman, P. (2004). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience?. *Personality and Social Psychology Review*, 8, 364–382.
- Rokeach, M. and Rothman, G. (1965). The principle of belief congruence and the congruity principle as models of cognitive interaction. *Psychological Review*, 72 (2), 128-142.
- Shapiro, S. (1999). When an Ad's Influence is beyond our Conscious Control: Perceptual and Conceptual Fluency Effects Caused by Incidental Ad Exposure. *Journal of Consumer Research*, 26 (1), 16-36.
- Smith, R.E, MacKenzie, S.B., Yang, X., Buchholz, L.M. and Darley, W.K. (2007). Modeling the Determinants and Effects of Creativity in Advertising. *Marketing Science*, 26(6), 819-833.
- Snodgrass, J. G. & Vanderwart, M. (1980). A standardized set of 260 pictures: norms for name agreement, image agreement, familiarity and visual complexity. *Journal of experimental psychology: Human Learning and memory*, 6(2), 174.
- Song, H. and Schwarz, N. (2008). If it's hard to read, it's hard to do: Processing fluency affects effort prediction and motivation. *Psychological Science*, 19 (10), 986-988.
- Storme, M., Myszkowski, N., Davila, A., & Bournois, F. (2015). How subjective processing fluency theory predicts attitudes toward visual advertisements and purchase intention. *The Journal of Consumer Marketing*, 32(6), 432-440.

- Van Rompay, T.J., de Vries, P.W. & van Venrooij, X.G.(2010). More than words: on the importance of picture–text congruence in the online environment. *Journal of Interacting Marketing*, 24 (1), pp. 22–30.
- Whittlesea, B.W.A. (1993). Illusions of familiarity. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 19 (6), 1235-1253.
- Yoo, J. and Kim, M. (2014). The effects of online product presentation on consumer responses: A mental imagery perspective. *Journal of Business Research*, 67, 2464-2472.
- Zhao, M., Hoeffler, S. & Dahl, D. (2007). Visualization and new product evaluation: The role of memory-and imagination-focused visualization. *Advances in consumer research*: Gavan J Fitzsimons and Vicki G. Morwitz, forthcoming.