

# Typography of Commercial Websites: The Effects of the Interline Spacing on Internet Users' Reactions

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## Abstract

As long as the text on commercial websites is omnipresent, managers are brought to make decisions concerning the typography in terms of typeface characteristics, spacing and layout. This research is particularly interested in the effect of text's interline spacing of commercial websites. The results of an experimental study, conducted on 122 buyers, show that Internet users who visited a site with a wide spacing experience felt a stronger sensation of well-being than those who visited it with narrowed spacing. The wide interline spacing also allows to arouse better perceived aesthetics of the website. However, the effect of interline spacing on behavioral intentions is not direct. These intentions depend, on the one hand, on the simple mediation of well-being and, on the other hand, on the multiple mediation of the perceived aesthetics and then on the perceived ease of use of the website.

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## 1. Introduction

Faced with the competitive intensification of online commerce and thus the need for differentiation that results from it, websites are increasingly relying on textual content to improve their search engine optimization (SEO) and enhance their online attractiveness (Canivet-Bourgau, 2017). However, while it is true that the presence of text offers a myriad of advantages in terms of site visibility and persuasion, the fact remains that its typography<sup>1</sup> is a top priority for managers in search of visual staging of the interfaces and continuous improvement of the browsing experience.

Many studies have focused on typography in several disciplines such as semiotics, linguistics, cognitive psychology, design or art history. In this vein, particular attention was paid to the typeface and the character size and much less to interline spacing, defined as "the existing distance between lines of text" (McCarthy and Mothersbaugh, 2002). However, everything suggests that it is a stimulus that can affect the reactions of individuals by guiding the reader in the treatment of information (Lemarié et al., 2008) and by inducing mental associations during visual exploration of the webpage (McCarthy and Mothersbaugh, 2002). Similarly, Lemoine and Zafri (2017) specify, in a preliminary qualitative study, that spacing is the typographic component that is most likely to generate emotional and behavioral reactions to the website.

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<sup>1</sup> Typography deals with the form, spacing, and layout of words and sentences. It is a function of three factors: 1- Typeface characteristics (style, size, x-height, weight, slant, stress, color and movement). 2- Spacing characteristics (distance between words, between letters within words, and between lines of text). 3- Layout characteristics (number of columns, length of the line of text, text justification, and contrast among text units) (McCarthy and Mothersbaugh, 2002).

Although earlier research, made in the context of human-machine interaction and psycholinguistics, shows that interline spacing can affect the readability of the text and the reading behavior of the individual (Bentley, 1921; Campbell, 1995, Chung, 2004, Van Overschelde and Healy, 2005, Bernard et al., 2007, Lee et al, 2011, Sergeev and Tarasov, 2013), it seems then useful to study, from a marketing point of view, the influence of this typographic factor on the reactions of Internet users in an online shopping context.

In digital marketing, interline spacing is an environmental component of the “ambient” dimension of the web atmosphere, as much as color, images and sound (Lemoine, 2008)<sup>2</sup>. In order to examine its influence on the responses of Internet users, we use the Stimulus-Organism-Response (SOR) model (Mehrabian and Russell, 1974, Eroglu et al., 2001) according to which atmospheric factors are likely to influence, as a first step, the internal reactions (emotions, cognitions) of the individual and then his behavior. In this logic, we made the choice to adopt this model, which is commonly used to report the effects of a website's atmosphere on the Internet users' reactions (Chang et al., 2014, Koo and Ju, 2010, Mummalaneni, 2005). At the emotional level, this article proposes to study the influence of the interline spacing on the well-being defined as “a pleasant emotional state, of weak activation which mixes sensations of calm and well-being”<sup>3</sup> (Lichtlé and Plichon, 2014). On the cognitive level, this research attempts to examine the impact of interline spacing, on the one hand, on the perceived aesthetics that refers to the evaluation of the site's beauty and seamliness (Yeh et al, 2015), and on the other hand, on the perception of its ease of use reflecting the degree to which a person believes that the use of the site would be without physical and mental efforts (Visinescu et al., 2015, Davis et al., 1989). At the conative level, this paper aims to test the direct effect of the interline spacing on the behavioral intentions of the user.

Through this research, we would like to enrich the literature in typography marketing, that has not, until now, been interested in the influence of interline spacing in an online sales context. From a managerial point of view, this research aims to inform the professionals on the type of spacing to privilege, given the emotional and behavioral responses they want to arouse in their customers. It also aims to make them more aware of the consequences of their choice in typographic matters, in particular by examining the impact of interline spacing on the well-being felt, the perceived ease of use of the site, the perceived aesthetics of the site and the behavioral intentions.

## **2. Research model and hypotheses**

The physiology of reading suggests that reduced interline spacing would lead to overlaps between successive lines (McCarthy and Mothersbaugh, 2002) which may be confusing for the reader and make recognition quite difficult because it requires longer and/or repeated fixations on the same letters and words (Pollatsek and Rayner, 1982, Rayner et al., 1998). However, even if the effects of very large spacing on the speed of reading are controversial, researchers agree that, given the interline scale used in general for the text of electronic interfaces, the increase in interlining level creates a feeling of ease, well-being and visual comfort when reading (Sergeev

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<sup>2</sup> The other two dimensions of the web atmosphere are design (navigability of the site, accessibility of the offer) and social factors (virtual assistants, forums, customer reviews) (Lemoine, 2008).

<sup>3</sup> Following an exploratory study conducted with 28 Internet users, it has been shown that the main emotions generated by the typography of commercial websites are: well-being (34% of citations), pleasure (23% of citations), constriction (18% of citations), nervousness (11% of citations), confusion (8% of citations) and finally relaxation (6% of citations) (Lemoine and Zafri, 2017).

and Tarasov 2013, Lee et al., 2011, Chung 2004). In line with these studies, we formulate hypothesis H1a according to which the well-being felt during the visit of the commercial sites will be higher when the spacing is wide than when it is narrowed. Moreover, in view of considering the well-known mediating effects of emotions on behavioral intentions in the literature on the web atmosphere (Eroglu et al., 2003, Mummalaneni, 2005), we hypothesize that well-being mediates the effects of interline spacing on behavioral intentions (H1b).

Previous research has shown that the perceptual fluency with which consumers can identify and process the information of an object significantly improves individuals' attitudes and gives the impression of an easier understanding and interaction with this object (Reber et al., 2004; Labroo et al., 2008; Hart et al., 2013). Based on the literature available in reading physiology, we can expect that a wider line will increase the perceptual fluency, the understanding of the information and will reduce the effort involved in the research. This can be inferred by an easier interaction with the site and a better perception of its ease of use. We therefore make the following hypothesis: the perceived ease of use of the site will be judged more favorably when the line spacing is wider than when it is narrowed (H2a). Several researches in human-machine interaction using the technology acceptance model have demonstrated the mediating effect of ease of use in explaining Internet users' behaviors (Davis et al., 1989; Visinescu et al., 2015). Based on this literature, we formulate Hypothesis H2b according to which the perceived ease of use of the site mediates the influence of interline spacing on behavioral intentions.

Interlining can also influence judgments about the aesthetics of the site by affecting the physical appearance of the web page. Studies in design and semiotics emphasize that wide spacing is often associated with simplicity and purity and de facto reduces the visual complexity of the page (McCarthy and Mothersbaugh, 2002). According to Pandir and Knight (2006) this would result in a better perception of aesthetics. In fact, several studies support the idea that the aesthetic judgments made by individuals are all the more favorable when the visual complexity is less important (Bauerly and Liu 2008, Pandir and Knight 2006). Thus, we hypothesize that the perceived aesthetics of the site will be more favorable when the interline spacing is wide than when it is narrowed (H3a).

Additionally, some studies have already established that the perception of aesthetics is an antecedent of intention to revisit by Internet users (Yoo and Donthu, 2001). Similarly, in design, some research has highlighted the determining role of aesthetics in consumer buying behavior (Celhay and Trinqucoste, 2015). We thus formulate the hypothesis according to which the perceived aesthetics of the site mediates the influence of the interline spacing on the behavioral intentions (H3b).

Furthermore, it seems useful to ask ourselves about the mediating role of the variables that could enrich the understanding of the relationship "interline spacing - behavioral intentions", including the perception of aesthetics of the site and that of its ease of use. Existing relationships between the aesthetics of systems and their ease of use are generating more and more studies (Hassenzahl, 2004; Tuch et al., 2012; Lee, 2013). Several studies have found a strong correlation between perception of aesthetics and perceived ease of use (Hartmann et al., 2008; Lavie and Tractinsky, 2004). Some authors believe that « what is usable is beautiful » (Ben-Bassat et al., 2006; Lee and Koubek, 2010). Others, instead, argue that "what is beautiful is usable" referring to the study by Tractinsky et al. (2000) whose evocative title was "what is beautiful is usable".

We propose to jointly analyze the effect of these two variables and present them in a multiple mediation relationship in series. Hence our hypothesis H4: the effect of interline spacing on behavioral intentions is mediated by the perceived aesthetics of the site and then by the perception of its ease of use.

Finally, in line with the studies on the atmosphere of websites that have identified direct links between atmospheric factors and behavioral intentions (Bonnardel et al, 2011, Cherif and Lemoine, 2019), we suggest to test the validity of the following hypothesis: the behavioral intentions will be more favorable on the site with a large interline spacing than on the site with a narrowed interline spacing (H5).

### **3. Research methodology**

#### **3.1. Experimental procedure**

In order to test the validity of our hypotheses, an inter-subject online experiment was conducted with 122 Internet users. Interline spacing was handled on two levels: narrowed and wide. To define more precisely and realistically the values of these two methods, we conducted a benchmark with 42 French commercial sites across all business sectors. The results of this benchmark established that the median line spacing is 127%. Using the median-split method, the values of 100% (narrowed) and 140% (wide) were selected. Two versions of a commercial website selling electric toothbrushes with fictitious brands were designed (see Appendix 1). Following a pre-test conducted with 96 respondents, the realism of the sites and their speed of download were considered satisfactory. The same is true for the perceived congruence between the typography of the site and the category of product. In addition, we have selected the electric toothbrush as a product category because it is a product that can be purchased via the Internet and by many individuals, regardless of age, income and gender. Moreover, it is a product that is both utilitarian and hedonic, which is appropriate for our study given the affective and cognitive nature of the variables of our model. Finally, given the diversity of web access tools used by the consumer, we limited our investigation to the case of the computer because it remains the device most used by Internet users to make a purchase on the Internet (79% sales) (FEVAD, 2018).

#### **3.2. Data collection, sample**

To compose our sample and administer our online questionnaire, we used the Cint (Sphinx Online) panel. The mood before visiting the site was measured as well as the involvement towards the product category and price perception. Each participant was randomly assigned to one of the two versions of the site to simulate an online shopping act. At the end of the visit, the Internet user was subjected to the scales of measurement of the variables studied. To be eligible for this study, the respondent must have already made at least one purchase on the Internet in the last 12 months and be connected via a computer when administering our survey. To participate in the study, it was also necessary that the Internet user did not set special preferences on his browser such as zoom and that he did not have a vision problem. A person who did not meet these criteria could not continue to respond to the survey. Control filter questions were therefore used from the beginning of the questionnaire. Similarly, we have implemented a strict database clean-up procedure, retaining only those participants who surfed at least three pages with reference to Bucklin and Sismeiro (2003), and discarding observations with extreme values on

several items. This collection allowed us to collect 122 valid responses (60 respondents for the narrowed line spacing version and 62 for the wide line version, see Appendix 2). These two samples were representative of the buyers of electric toothbrushes on the Internet.

### **3.3. Manipulation check and homogeneity of the samples**

The comparison of averages shows that there are statistically significant differences between the two experimental conditions ( $M_{\text{narrowed spacing perception}} = 3,04$  et  $M_{\text{wide spacing perception}} = 4,61$  ;  $t = -,827$  ;  $p = 0,000$ ). It is therefore possible to conclude that the two types of line spacing are perceived as different by the two groups of respondents. In addition, using the Chi-square test, it was verified that the two samples made were matched in terms of gender ( $\chi^2 = 0,036$ ;  $p = 0,849$ ), age ( $\chi^2 = 2,950$ ;  $p = 0,566$ ), and the frequency of purchase on the Internet ( $\chi^2 = 0,355$ ;  $p = 0,551$ ) (Appendix 2).

### **3.4. Measurement scales**

Well-being was measured via the Lichtle and Plichon scale (2014), the perceived ease of use and the perceived aesthetics of the site using the Bressolles scale (2006) and the behavioral intentions thanks to the Keeling et al. (2007) scale. For other control variables, product category involvement was measured with the Strazzieri scale (1994), mood before the site's visit with the Peterson and Sauber (1983) scale, and finally the price perception using the Gonzalez single-item scale (2005). All items were measured by 7-step Likert scales (see Appendix 3).

### **3.5. Data analysis method**

To test our research model, we favored the PLS structural equation modeling method because of its requirements in terms of sample size, multivariate normality and its ability to integrate any type of scale (nominal, ordinal or metric) (Hair et al., 2014). The reliability and convergent validity of the measurements were first studied and proved satisfactory following the exploratory and confirmatory factorial analyzes (Appendix 3). In the same way, the discriminant validity between the constructs has been established (Appendix 4).

## **4. Research results**

### **4.1. Preliminary analyzes**

Before testing the hypotheses, we made sure of the similarity of the people assigned to each of the experimental conditions. No significant difference was found for mood before site visit ( $p=0,443$ ), product involvement ( $p = 0,896$ ) and price perception ( $p = 0,701$ ) (see Appendix 5).

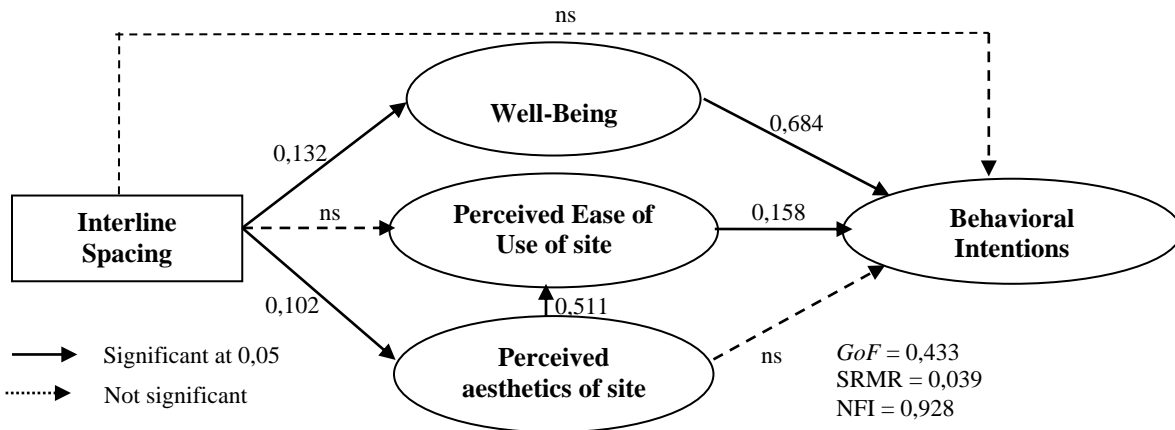
### **4.2. Direct effects**

The level of the interline spacing has been coded as follows: 1 = narrowed; 2 = wide. The model indicates a satisfactory GoF of 0,433 ( $> 0,36$ ). The direct effects of interline spacing on the well-being and perceived aesthetics of the site are significant (H1a and H3a supported). Wide line spacing leads to more favorable reactions than narrowed line spacing. On the other hand, no significant effect was found with regard to the direct influence of line spacing on ease of use (H2a not supported) and on behavioral intentions (H5 not supported) (Appendix 6).

### 4.3. Mediation effects

The tests associated with bootstrap ( $n = 5000$  samples) allow to directly examine mediation effects. The results show that well-being is an indirect mediator of the effect of line spacing on behavioral intentions [0,090 ; (0,029 ; 0,152)] (H1b supported). Regarding the simple mediating role of the perceived ease of use and perceived aesthetics of the site, the statistical analyzes revealed no significant indirect effects (H2b and H3b not supported). However, the study of multiple mediation in series corresponding to the effect of interline spacing on behavioral intentions, including perceived aesthetics and perception of ease of use of site is significant. [0,008 ; (0,004 ; 0,016)] (H4 supported). A favorable perception of the aesthetics of the site resulting from wide line spacing results in a positive perception of the ease of use of the site which, in turn, will positively influence behavioral intentions (see Appendix 7).

**Figure 1. The research model**



### 5. Contributions, limitations and future research

On the theoretical level, this research presents four main contributions. The first is to look at the effects of the interline spacing of a website in a market context. This study comes to enrich the literature in marketing and more particularly that dealing with the impact of environmental factors on the behavior of Internet users. The second contribution of this article is to confirm the relevance of using the S-O-R model to account for the effects of line spacing on the reactions of Internet users. This thus overcomes the limits of the existing literature by going beyond the vision based on the readability and the cognitive processing of the information to propose another more global approach taking into account the affects and the behaviors of approach during the typographical choices. The third contribution of this research lies in the study of theoretical links that have never been studied until now in a digital market context. Thus, this research has demonstrated the existence of links between the interline spacing of a website and the well-being, perceived aesthetics, perceived ease of use and behavioral intentions. The last contribution of this paper is the demonstration of simple mediation effects of well-being and multiple mediation in series of the perceived aesthetics of the site and the perceived ease of use in the relation: interline spacing - behavioral intentions.

At the managerial level, we would recommend professionals to favor a rather wide line spacing. By making this choice, managers can increase the well-being of users, generate better judgment on the aesthetics of the site and its ease of use. Moreover, when they rely on this type of interlining, they are able to indirectly influence the behavioral intentions towards the site even more. In other words, by its effects on the internal and behavioral state of the visitor, line spacing is presented as a mechanism by which a website can create an interesting differentiation in a context of high competitive intensity.

Our research has limitations that should be emphasized. It has reduced external validity given the particularities of the device used (computer) and the category of products selected. In the future, similar experiments on other devices should be undertaken to take into account the adaptive nature of the current design of the websites (responsive design) and on sites selling other categories of products. In addition, our work has been reduced to the study of the effects of the type of interlining. We did not take into account other typographic features such as font and character size. It would therefore be relevant to look at the interaction effects between the typographic components of the site. Finally, to better understand the effects of interline spacing, it seems desirable to enrich our model with some moderating variables such as the purpose of the visit and the need for cognition or other dependent variables measuring the actual behavior of Internet users like the length of visit, the number of pages consulted and the nature of the shopping cart.

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## Appendix 1. The stimuli used for the experiment

Screenshot of the experimental website: narrowed line spacing



Liphis HX6512/02 – Programme blancheur -Rechargeable  
102,05€  
Brossage : sonique  
Alimentation : rechargeable  
Pulsations : 31000/min  
Accessoires : 2 manches EasyClean et 2 brossettes

[Ajouter au panier](#)

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Liphis HX6711/02 – 2 modes de brossage – 31 000 pulsations/min  
102,12€  
Brossage : sonique  
Modes de brossage : standart et blancheur  
Alimentation : rechargeable  
Accessoires : 1 brossette

[Ajouter au panier](#)

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Liphis HX6713 – Programme blancheur – 3 brossettes – 31000/min  
99,99€  
Brossage : sonique en 2 modes Clean et Clean White  
Alimentation : rechargeable  
Pulsations : 31000/min  
Accessoires : 3 brossettes fournies

[Ajouter au panier](#)

## Screenshot of the experimental website: wide line spacing



Liphis HX6512/02 – Programme blancheur -Rechargeable

102,05€

Brossage : sonique

Alimentation : rechargeable

Pulsations : 31000/min

Accessoires : 2 manches EasyClean et 2 brossettes

Ajouter au panier



Liphis HX6711/02 – 2 modes de brossage – 31 000 pulsations/min

102,12€

Brossage : sonique

Modes de brossage : standart et blancheur

Alimentation : rechargeable

Accessoires : 1 brossette

Ajouter au panier



Liphis HX6713 – Programme blancheur – 3 brossettes – 31000/min

99,99€

Brossage : sonique en 2 modes Clean et Clean White

Alimentation : rechargeable

Pulsations : 31000/min

Accessoires : 3 brossettes fournies

Ajouter au panier

## Appendix 2. Sample characteristics

Sample		Version 1 (narrowed spacing) n = 60		Version 2 (wide spacing) n = 62		$\chi^2$ test
Variable	Modality	n	%	n	%	
Sex	Male	n	%	30	48%	$\chi^2 = 0,036$ ; ddl = 1 ; p = 0,849
	Female	28	47%	32	52%	
Age	18-24 years	32	53%	8	13%	$\chi^2 = 2,950$ ; ddl = 4 ; p = 0,566
	25-39 years	9	15%	20	32%	
	40-59 years	19	32%	17	27%	
	60-69 years	20	34%	14	23%	
	70 years and over	7	12%	3	5%	
Frequency of purchase on the Internet	(-)1time/month	5	7%	26	42%	$\chi^2 = 0,355$ ; ddl = 1 ; p = 0,551
	(+)1times/month	22	37%	36	58%	

### Appendix 3. The measures and their psychometric properties

Scales	Items	L	$\alpha$	CR	AVE
Well-being (Lichtlé and Plichon, 2014)	It's warm	,880	,935	,950	,792
	You feel a sense of harmony	,893			
	I get a nice feeling	,886			
	You feel Zen	,890			
	You feel chilled	,902			
Perceived Ease of Use (Bressolles, 2006)	The site is easy to use	,890	,954	,965	,845
	It is easy to move around and find what I am looking for on the site	,916			
	The organization and the layout of the site make information research easy	,939			
	The site is laid out in a clear and simple way	,931			
	It is easy to look for information on the site	,920			
Perceived aesthetics (Bressolles, 2006)	The site is visually attractive	,971	,967	,979	,939
	The site looks good	,970			
	The site is creative	,966			
Behavioral Intentions (Keeling <i>et al.</i> , 2007)	likely to buy	,890	,885	,929	,813
	likely to revisit	,920			
	likely to recommend	,895			
Product Involvement (Strazzieri, 1994)	I am particularly attracted by this product	,926	,967	,974	,860
	The simple fact of learning about this product is a pleasure	,938			
	I particularly like to talk about this product	,913			
	You can say that is a product that interests me	,933			
	It's a product that really matters to me	,944			
	It's a product to which I attach special importance	,908			
Mood before the site's visit (Peterson et Sauber, 1983)	Currently I am in a good mood	,837	,902	,931	,771
	As I answer these questions, I feel very cheerful	,904			
	For some reason, I am not very comfortable right now	,884			
	At this moment, I feel edgy or irritable	,886			
Price perception (Gonzalez, 2005)	Cheap / expensive	-	-	-	-

L = Loadings;  $\alpha$  = Cronbachs alpha; CR= Composite reliability; AVE = Average variance extracted.

### Appendix 4. Discriminant validity: Matrix of correlations between constructs

	(1)	(2)	(3)	(4)	(5)	(6)
Well-being (1)	<b>,890*</b>					
Ease of use (2)	,481	<b>,919*</b>				
Perceived aesthetics (3)	,813	,509	<b>,969*</b>			
Behavioral Intentions (4)	,761	,487	,637	<b>,902*</b>		
Involvement (5)	,621	,227	,545	,582	<b>,927*</b>	
Mood (6)	,223	,060	,167	,234	,190	<b>,878*</b>

\* Square root of the AVE

### Appendix 5. Homogeneity of control variables

	Means		Levene's test		Comparison of means <i>t</i> -test	
	Narrowed spacing	Wide spacing	F	Sig.	<i>t</i>	Sig.
Mood before the site's visit	4,645	4,528	2,418	0,123	0,770	0,443
Involvement	2,972	3,011	1,357	0,246	-0,131	0,896
Price perception	4,02	3,94	0,022	0,883	0,385	0,701

### Appendix 6. Results of the direct effects

		Path coefficient	<i>t</i>	<i>p</i>
H1a	Interline spacing -> Well-being	,132	2,999	,003
H2a	Interline spacing -> Ease of use	-,010	,245	,807
H3a	Interline spacing -> Perceived aesthetics	,102	2,281	,023
H5	Interline spacing -> Behavioral Intentions	,005	,179	,858
Other direct effects	Well-being -> Behavioral Intentions	,684	13,103	,000
	Ease of use -> Behavioral Intentions	,158	4,470	,000
	Perceived aesthetics -> Behavioral Intentions	-,001	,009	,993
	Perceived aesthetics -> Ease of use	,511	14,660	,000

### Appendix 7. Results of the mediating effects

		Indirect effect	<i>t</i>	<i>p</i>	Confidence interval
H1b	Interline spacing -> Well-being -> Behavioral Intentions	,090	2,892	,004	[0,029 ; 0,152]
H2b	Interline spacing -> Ease of use -> Behavioral Intentions	-,002	,237	,813	[-0,014 ; 0,011]
H3b	Interline spacing -> Perceived aesthetics -> Behavioral Intentions	-,001	,008	,994	[-0,013 ; 0,013]
H4	Interline spacing -> Perceived aesthetics -> Ease of use -> Behavioral Intentions	,008	1,982	,048	[0,004 ; 0,016]
Other mediating effect	Interline spacing -> Perceived aesthetics -> Ease of use	,052	2,225	,026	[0,007 ; 0,099]