The Antecedents of Advertisement Scepticism and Its Effects on the User Experience of Social Influence Features in the Context of Online Shopping

Makkonen, Markus; Sell, Anna; Walden, Pirkko; Frank, Lauri; Nevala, Emma

Published in:
Proceedings of the 57th Hawaii International Conference on System Sciences

Published: 01/01/2024

Document Version
Final published version

Document License
CC BY-NC-ND

The Antecedents of Advertisement Scepticism and Its Effects on the User Experience of Social Influence Features in the Context of Online Shopping

Markus Makkonen
University of Jyvaskyla
markus.v.makkonen@jyu.fi

Anna Sell and Pirkko Walden
Åbo Akademi University
anna.sell@abo.fi
pirkko.walden@abo.fi

Lauri Frank and Emma Nevala
University of Jyvaskyla
lauri.frank@jyu.fi
emma.jo.nevala@student.jyu.fi

Abstract

Modern online advertising often employs different kinds of social influence features, which are likely to be experienced differently by different users, such as individuals with different levels of advertisement (ad) scepticism. In this study, we focus on these differences by examining (1) how different kinds of personality and demographic traits affect ad scepticism, and (2) how ad scepticism, in turn, affects the user experience of four different kinds of social influence features. By using data from 628 online shoppers, we find ad scepticism to be affected by four out of the Big Five personality traits as well as age and education. We also find ad scepticism to negatively affect user experience, with a stronger effect in the case of social pressure than social proof features. These novel findings promote our understanding of the antecedents of ad scepticism and of the potential risks of employing social influence features in online advertising.

Keywords: online shopping, social influence features, advertisement scepticism, user experience, Big Five personality traits

1. Introduction

In 2023, worldwide online advertising spending has been forecasted to reach an all-time high of 681 billion USD (Statista, 2023), making online advertising an inseparable part of the everyday life of practically all consumers. The effectiveness of online advertising is often measured by its ability to persuade consumers to click through to an online store and make a purchase (Ha, 2008). To do this, online advertising employs different kinds of features that aim at influencing consumer behaviour, often exploiting the innately social character of humans. In online shopping, our behaviour is influenced even by the implied social presence or behaviour of other consumers (Messer et al., 2017), which is the rationale behind online advertising that employs different kinds of *social influence features*. Examples of these are highlighting products that are commonly purchased together or that are popular with other consumers. In prior research, advertisement (ad) scepticism has been shown to influence the effectiveness of, for example, native advertising (Yang et al., 2021). However, its role in the context of online advertising that employs different kinds of social influence features has received little to no attention in prior research. In addition, our overall understanding of the antecedents of ad scepticism itself remains limited (Chaudhary et al., 2019).

In this study, we aim to address these gaps in prior research by focusing on the role of ad scepticism as a mediator for the effects of personality and demographic traits on the user experience of different kinds of social influence features that are commonly used in online shopping. More specifically, we aim to answer the following two research questions: (1) *how do different kinds of personality and demographic traits affect ad scepticism*, and (2) *how does ad scepticism, in turn, affect the user experience of different kinds of social influence features*? To do this, we use data from 628 online shoppers, which was collected with an online survey between February and March 2023 and is analysed with structural equation modelling (SEM). Our findings contribute to a better understanding of the antecedents of ad scepticism and the potential risks of employing social influence features in online advertising, which both aid online retailers in making more informed decisions on the use of social influence features in their online stores.

After this introduction section, we present the theoretical background of the study as well as our research model and research hypotheses in Section 2. This is followed by the reporting of the research methodology in Section 3 and research results in Section 4. The research results are discussed in more detail in Section 5 before concluding the paper with a brief discussion of the limitations of the study and some potential paths for future research in Section 6.

URI: https://hdl.handle.net/10125/106526
978-0-9981331-7-1

2. Theoretical background and hypotheses

Consumer scepticism has been conceptualised and measured in various ways (Chaudhary et al., 2019). Ad scepticism is defined by Obermiller and Spangenberg (1998) as the tendency toward disbelief of ad claims. More specifically, Obermiller and Spangenberg (1998) see ad scepticism as a stable and generalisable marketplace belief that generalises across media within individuals, although the medium may exert a situational influence on scepticism toward a specific ad.

Obermiller and Spangenberg (1998) suggest that the main antecedents of ad scepticism are personality traits and marketplace experiences, of which the latter are influenced by demographic traits, such as age and education. Research on personality traits as antecedents of consumer and ad scepticism has focused mainly on cynicism, self-esteem, consumer effectiveness, and reactance (Chaudhary et al., 2019). The five-factor model of personality is an established approach for representing human personality. The "Big Five" personality traits of extraversion, agreeableness, conscientiousness, neuroticism (or emotional stability), and openness to experience have been validated in numerous studies and found to capture human personality comprehensively (McCrae & John, 1992; Roccas et al., 2002). However, they have scarcely been studied in relation to ad scepticism. Prior research has also produced rather mixed results on the role of demographic traits, such as gender, age, and education, as antecedents of consumer and ad scepticism, with age typically having a positive effect, but the effects of both gender and education varying between studies (Chaudhary et al., 2019).

Social influence is understood as how an individual is influenced by the behaviour of others (Li, 2013). Social influence theory has been applied to many contexts, such as studying how the technology adoption of an individual is affected by the opinions and behaviours of others (Wang et al., 2013). Social influence features refer to design patterns utilised by online retailers to improve customer onboarding (Roethke et al., 2020). They can rely on *social proof,* where customers are provided with information about the behaviour of other customers, or on *social pressure*, where customers are presented with information in a way that creates a sense of urgency or stress (Messer et al., 2017; Schneider et al., 2020). Examples of social proof features are ratings and reviews provided by other customers and product recommendations based on the purchases of other customers (Benlian et al., 2012). In turn, examples of social pressure features are product badges highlighting that a product is very popular or low in stock and activity messages informing that another customer has just added the product to their shopping cart. Social pressure features trigger the feelings of crowding, competition, and stress, and are typically experienced as more manipulative than social proof features (Messer et al., 2017).

In one of the few studies examining the Big Five personality traits in relation to social influence features, Oyibo and Vassileva (2019) focused on the relationship between the Big Five personality traits and consumer susceptibility to different social influence features. They found links between susceptibility to social proof and high neuroticism, low openness to experience, and low conscientiousness. Overall, there is evidence of the importance of personality traits in relation to advertising. For example, Hirsh et al. (2012) found that the ads tailored to appeal to specific personality traits were rated more positively, Orth et al. (2010) found that personality traits have an impact on the affective responses toward ads, and Uribe et al. (2022) studied the effectiveness of traditional and augmented reality ads, finding that personality traits partly moderated the reception of the ads. In the remainder of this section, we develop and present our research hypotheses, which are summarised in the research model illustrated in Figure 1.

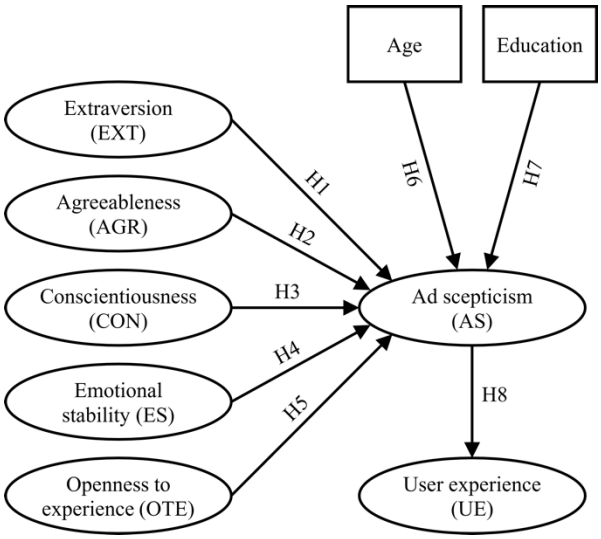


Figure 1. Research model.

Of the Big Five personality traits, *extraversion* is characterised by sociability, assertiveness, and positive emotionality (John et al., 2008), whereas a low level of extraversion is characterised by cautiousness and a tendency to be reserved (Roccas et al., 2002). While extraversion has not been previously studied in relation to ad scepticism, prior research has found extraversion to be negatively linked to consumer scepticism of corporate social responsibility (CSR) behaviours (Moscato & Hopp, 2019), thus suggesting an overall negative link between extraversion and scepticism in the consumer context. Based on this, we hypothesise as follows:

H1: Extraversion affects ad scepticism negatively.

Agreeableness is characterised by benevolence, trust, compliance, and the willingness to defer when in a situation of interpersonal conflict (Roccas et al., 2002; John et al., 2008; McCrae & Costa, 2008). At the opposite end of the continuum, antagonistic individuals tend to be suspicious and fault-finding (John et al., 2008; McCrae & Costa, 2008). Like extraversion, agreeableness has been found to be negatively linked to consumer scepticism of CSR behaviours (Moscato & Hopp, 2019). In addition, agreeableness has been found to be negatively linked to various dimensions of cynicism in the organisational context (Acaray & Yildirim, 2017), whereas less cynical individuals have been found to have lower levels of consumer and ad scepticism (Chaudhary et al., 2019; Obermiller & Spangenberg, 1998). Based on this, we hypothesise as follows:

H2: Agreeableness affects ad scepticism negatively.

Conscientious individuals tend to be responsible, careful, and scrupulous as well as have a tendency to make decisions carefully and avoid impulsive behaviour (Roccas et al., 2002). In prior research, conscientiousness has been found to be negatively linked to sharing paid ads on social media (Clark & Çallı, 2014), which suggests a positive link between conscientiousness and ad scepticism. In addition, consciousness has been found to be negatively linked to susceptibility to social influence (Oyibo & Vassileva, 2019), which would also seem to suggest a positive rather than negative link between conscientiousness and ad scepticism. Based on this, we hypothesise as follows:

H3: Conscientiousness affects ad scepticism positively.

Emotionally stable individuals tend to be calm, poised, and contented (Roccas et al., 2002; John et al., 2008). At the opposite end of the continuum, neuroticism is characterised by anxiousness, insecurity, anger, and pessimism (Roccas et al., 2002; John et al., 2008; McCrae & Costa, 2008). In prior research, emotional stability has been found to be linked to higher levels of self-esteem (Robins et al., 2001), whereas higher levels of self-esteem have been found to be linked to higher levels of consumer and ad scepticism (Chaudhary et al., 2019; Obermiller & Spangenberg, 1998). Based on this, we hypothesise as follows:

H4: Emotional stability affects ad scepticism positively.

Individuals with a high level of *openness to experience* tend to be intellectual, imaginative, and curious as well as have a tendency to the autonomy of thought and openness to new ideas (Roccas et al., 2002; John et al., 2008). McCrae and Costa (1997, p. 830) describe such individuals as "particularly reflective and thoughtful about the ideas they encounter". In prior research, openness to experience has been found to be negatively linked to the tendency of consumers to form positive attitudes toward ads (Lee et al., 2017), which suggests a positive link between openness to experience and ad scepticism. In addition, openness to experience has been found to be negatively linked to susceptibility to social influence (Oyibo & Vassileva, 2019), which would also seem to suggest a positive rather than negative link between openness to experience and ad scepticism. Based on this, we hypothesise as follows:

H5: Openness to experience affects ad scepticism positively.

In turn, in terms of demographic traits, Obermiller and Spangenberg (1998) hypothesise a positive link between age and ad scepticism as well as between education and ad scepticism, with the reasoning that older and more educated consumers are likely to have more marketplace experiences. These hypotheses have also received support in numerous other studies (e.g., Tan & Tan, 2007; Lee, 2015; McCreery & Krugman, 2017; Chaudhary et al., 2019). Based on this, we present the following two hypotheses:

H6: Age affects ad scepticism positively.

H7: Education affects ad scepticism positively.

Finally, the link between ad scepticism and user experience has not been studied in any prior research that we are aware of, but we hypothesise that individuals with higher levels of ad scepticism are likely to identify social influence features as ads more frequently and, thus, experience them more negatively. Based on Obermiller and Spangenberg (1998), the level of ad scepticism is also likely to be impacted by how the ad is structured and executed. Ads that utilise the more neutral social proof features are likely to invite less scepticism and result in less negative user experience than the ads that utilise the more manipulative social pressure features. Based on this, we present the following final hypothesis:

H8: Ad scepticism affects the user experience of social influence features negatively, with the effect being stronger for social pressure than social proof features.

3. Methodology

The data for this study was collected with an online survey between February and March 2023. The survey respondents were recruited by sharing the survey link in the SurveyCircle service, via the e-mail list of the students at the Faculty of Information Technology at the

University of Jyväskylä, and via social media. In the survey questionnaire, the respondents were first inquired about their basic demographic background information as well as about their Big Five personality traits and ad scepticism. After this, they were shown examples of four social influence features (cf. Appendix A) and inquired about their user experience related to them. The first two features – ratings and reviews (RR) as well as product recommendation systems (PRS) – exemplified the more neutral social proof features, whereas the two last two features – product badges (PB) and activity messages (AM) – exemplified the more manipulative social pressure features. At the end of the survey, the respondents also had the option to participate in a prize drawing of three Amazon gift cards worth 20 € each.

In the survey, both ad scepticism and user experience were measured reflectively with multiple items. Ad scepticism was measured with the nine items by Obermiller and Spangenberg (1998) that were rated by using a seven-point Likert scale, whereas user experience was measured with three items from the user experience questionnaire by Laugwitz et al. (2008) that were rated by using a five-point semantic differential scale and together covered both the utilitarian and the hedonic dimensions of user experience. In turn, the Big Five personality traits were measured with the ten items of the ten-item personality inventory (TIPI) by Gosling et al. (2003) that were each rated by using a seven-point Likert scale. As instructed in TIPI, the total score of each personality trait was then calculated by averaging the scores of the two items that were used to measure it. Wordings of all these items are reported in Appendix B. Finally, age and education were both measured with a single item each. In order to avoid forced responses, responding to all the items in the survey was voluntary, and not responding resulted in a missing value.

Before the actual analysis, the scores of all the items that were measuring ad scepticism were reversed so that higher scores represented higher levels of ad scepticism. The same was done for the five reversely worded items of TIPI so that higher scores represented higher levels of each personality trait. The actual analysis was conducted with covariance-based structural equation modelling (CB-SEM) by using the Mplus version 8.8 software (Muthén & Muthén, 2023) and following the guidelines by Gefen et al. (2011) for SEM in administrative and social science research. As the model estimator, we used the robust maximum likelihood (MLR) estimator due to its ability to handle also non-normal data. The potential missing values were handled by using the full information maximum likelihood (FIML) estimator, which uses all the available data in model estimation.

The collected data was analysed in three consecutive phases. In the first phase, we examined the reliability and validity of the used measures at both construct and indicator levels by estimating a generic model that contained all the constructs and their indicators but did not yet specify any causal relationships between the constructs. Here, the focus was especially on the reflectively measured ad scepticism and user experience constructs. Of the two latter phases, the second phase focused on testing H1–H7, whereas the third phase focused on testing H8. That is, in the second phase, we examined the antecedents of ad scepticism by estimating a model in which it was explained by the Big Five personality traits as well as age and education. In turn, in the third phase, we examined the potential differences in the effects of ad scepticism on user experience and in the mean scores of user experience between the four social influence features by using multiple group analysis (MGA) to estimate a model in which user experience was explained by ad scepticism and the responses concerning the user experience of each of the four social influence features constituted four equally sized groups. In other words, in each group for each respondent, the responses concerning the exogenous ad scepticism construct remained the same (because they were measured only once for each respondent), whereas the responses concerning the endogenous user experience construct varied between the groups (because they were measured separately for each of the four social influence features).

While conducting MGA, we also tested for measurement invariance by following the testing procedure proposed by Steenkamp and Baumgartner (1998). In it, increasingly strict constraints on parameter equality are added across the groups and the fit of the resulting constrained model is compared to the fit of the unconstrained model. If the constraints result in no statistically significant deterioration in model fit, then the hypothesis on a specific type of measurement invariance is supported. If it is not supported, then the hypothesis on a specific type of partial instead of full measurement invariance may be tested by relaxing the added constraints one by one based on the modification indices of the model until the deterioration in model fit becomes statistically not significant. Configural invariance is tested by estimating the model separately in each group while constraining only the simple structure of the model as equal across the groups, whereas metric and scalar invariance are tested by additionally constraining the indicator loadings and indicator intercepts as equal across the groups. After this, the differences in the model constructs can be tested by examining their estimated mean scores in each group. In addition, the differences in the effects or paths between the model constructs can be tested by constraining the estimated path coefficients as equal across the groups. As a statistical test for examining the potential deteriorations in model fit, we used the χ^2 test of difference, in which the value of the test statistic was corrected with the Satorra-Bentler (2001) scaling

correction factor (SCF) due to the use of MLR as the model estimator. However, because the χ^2 test of difference is known to suffer from a similar sensitivity to sample size as the χ^2 test of model fit, we also considered the potential changes in the model fit indices as suggested by Steenkamp and Baumgartner (1998).

4. Results

In total, we received 628 valid responses. The descriptive statistics of this sample in terms of the gender, age, education, and nationality of the respondents as well as the timing of their previous online purchase are reported in Table 1. As can be seen, most of the respondents were relatively young Finns with at least some university degree. The age of the respondents ranged from 15 to 67 years, with a mean of 29.6 years and a standard deviation of 7.5 years. The gender distribution of the respondents was slightly skewed toward men. All the respondents also seemed to be relatively active online shoppers, with 85.9% of them having made a purchase online during the past month.

Table 1. Descriptive sample statistics (N = 628).

	N	%
Gender		
Man	389	61.9
Woman	222	35.4
Other	17	2.7
Age		
15–24 years	156	24.8
25–34 years	348	55.4
35 years or over	123	19.6
No response	1	0.2
Education		
No degree	168	26.8
Bachelor's degree	267	42.5
Master's degree	161	25.6
Licentiate or doctorate	30	4.8
No response	2	0.3
Nationality		
Finnish	519	82.6
USA	70	11.1
Other	39	6.2
Previous online purchase		
During the past week	271	43.2
During the past month	268	42.7
During the past year	79	12.6
Over a year ago	10	1.6

4.1. Construct reliability and validity

Construct reliability of the reflectively measured ad scepticism and user experience constructs was evaluated from the perspective of internal consistency by using the composite reliability (CR) of the constructs (Fornell & Larcker, 1981), which is commonly expected to be at least 0.7 (Nunnally & Bernstein, 1994). The CR of each construct is reported in the first column of Table 2, showing that they all met this criterion. The first column of Table 2 also reports the Cronbach's alpha (CA) of each Big Five personality trait construct, which were found to be in line with those reported for TIPI in the study by Gosling et al. (2003), who deem the scale as a valid measure of the Big Five personality traits despite its seemingly low internal consistency in terms of CA.

Table 2. Construct statistics.

Construct	CR / CA	AVE	Construct intercorrelations				
			AS	UE of RR	UE of PRS	UE of PB	UE of AM
AS	0.938	0.628	0.793				
UE of RR	0.847	0.652	-0.200	0.808			
UE of PRS	0.863	0.682	-0.333	0.208	0.826		
UE of PB	0.855	0.670	-0.512	0.180	0.369	0.819	
UE of AM	0.920	0.794	-0.645	0.143	0.351	0.626	0.891
EXT	0.654	–	-0.242	-0.010	0.069	0.150	0.158
AGR	0.248	–	-0.056	0.088	0.055	0.003	0.036
CON	0.494	–	0.035	0.010	0.011	-0.005	-0.069
ES	0.585	–	0.083	-0.042	-0.031	-0.062	-0.075
OTE	0.218	–	0.210	-0.027	0.005	-0.171	-0.193
Age	–	–	0.120	-0.198	-0.054	0.039	-0.002
Education	–	–	-0.161	0.018	0.072	0.137	0.168

In turn, construct validity of the reflectively measured ad scepticism and user experience constructs was evaluated from the perspectives of convergent and discriminant validity by using the two criteria by Fornell and Larcker (1981). They are both based on the average variance extracted (AVE) of the constructs, which is the average proportion of variance that a construct explains in its indicators. The first criterion concerning convergent validity expects each construct to have an AVE of at least 0.5. This means that, on average, each construct should explain at least half of the variance in its indicators. The AVE of each construct is reported in the second column of Table 2, showing that they all met this criterion. In turn, the second criterion concerning discriminant validity expects each construct to have a square root of AVE that is at least equal to its absolute correlations with the other constructs in the model. This means that, on average, each construct should share at least an equal proportion of variance with its indicators compared to what it shares with the other constructs in the model. The square root of AVE of each construct (on-diagonal) and the correlations between the constructs (off-diagonal) are reported in the remaining columns of Table 2, showing that this criterion was also met by all the constructs. Finally, we also evaluated and found no

signs of common method bias, with the Harman's single factor test (Podsakoff et al., 2003) suggesting a very bad fit with the data ($\chi^2(350) = 3{,}698.194$, $p < 0.001$, CFI = 0.572, TLI = 0.538, RMSEA = 0.123, SRMR = 0.101).

4.2. Indicator reliability and validity

Indicator reliability and validity of the reflectively measured ad scepticism and user experience constructs were evaluated by using the standardised loadings of their indicators, which are reported in Table 3. In addition, Table 3 reports the means and standard deviations (SD) of the indicator scores as well as the percentages of missing values of all the indicators.

Table 3. Indicator statistics (* = p < 0.001).**

Indicator	Mean	SD	Missing	Loading
AS1	5.319	1.449	0.6%	0.765***
AS2	5.222	1.628	0.2%	0.779***
AS3	4.880	1.477	0.3%	0.811***
AS4	4.792	1.443	0.3%	0.734***
AS5	5.604	1.502	0.3%	0.839***
AS6	5.607	1.432	1.6%	0.814***
AS7	5.214	1.423	0.3%	0.779***
AS8	5.204	1.508	0.2%	0.840***
AS9	4.816	1.562	0.3%	0.765***
UE1 of RR	3.347	1.013	0.3%	0.850***
UE2 of RR	3.282	0.976	0.5%	0.889***
UE3 of RR	3.564	1.213	0.3%	0.666***
UE1 of PRS	2.891	1.129	0.3%	0.874***
UE2 of PRS	2.918	1.081	0.5%	0.916***
UE3 of PRS	3.293	1.175	0.2%	0.665***
UE1 of PB	2.109	1.162	0.5%	0.895***
UE2 of PB	2.144	1.099	0.8%	0.928***
UE3 of PB	2.859	1.281	0.6%	0.590***
UE1 of AM	1.668	1.128	0.6%	0.893***
UE2 of AM	1.725	1.103	1.0%	0.958***
UE3 of AM	1.817	1.148	0.8%	0.817***
EXT1	3.486	1.722	0.3%	–
EXT2	3.190	1.585	0.3%	–
AGR1	3.802	1.482	1.0%	–
AGR2	5.022	1.361	0.6%	–
CON1	4.887	1.329	1.0%	–
CON2	4.243	1.633	0.5%	–
ES1	4.054	1.732	0.5%	–
ES2	4.860	1.399	0.8%	–
OTE1	4.826	1.303	0.5%	–
OTE2	4.442	1.600	1.3%	–

In the typical case of each indicator loading on only one construct, the standardised loading of each indicator is commonly expected to be statistically significant and at least 0.707 (Fornell & Larcker, 1981). This is equivalent to the standardised residual of each indicator being at least 0.5, meaning that at least half of the variance in each indicator is explained by the construct on which it loads. As can be seen, this criterion was met by all the indicators except for the third indicator of the user experience construct in the case of ratings and reviews (UE3 of RR), product recommendation systems (UE3 of PRS), and product badges (UE3 of PB). However, because the slightly lower loadings of these three indicators were not found to compromise the reliability or validity of any of the user experience constructs (cf. Section 4.1), we decided to retain them in the model.

4.3. Antecedents of ad scepticism

As for the antecedents of ad scepticism, the results of model estimation in terms of the standardised effect sizes and their statistical significance, the proportion of explained variance (R^2) in ad scepticism, and model fit are reported in Figure 2. Model fit was evaluated by using the χ^2 test of model fit and four model fit indices recommended by Hu and Bentler (1999): the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardised root mean square residual (SRMR). Of these, the χ^2 test of model fit rejected the null hypothesis of the model fitting the data, which is common in the case of large samples (Bentler & Bonett, 1980), whereas three out of the four model fit indices met the cut-off criteria recommended by Hu and Bentler (1999): CFI ≥ 0.95, TLI ≥ 0.95, RMSEA ≤ 0.06, and SRMR ≤ 0.08, with value of TLI also being very close. Thus, we consider the overall fit of the model acceptable. We also found no signs of multicollinearity, with the variance inflation factor (VIF) values calculated from the factor scores all being clearly less than three (Hair et al., 2018).

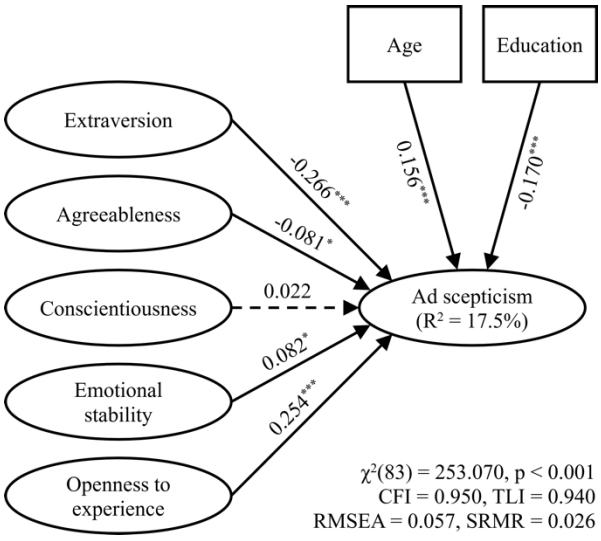


Figure 2. Model estimates and model fit (* = p < 0.001, ** = p < 0.01, * = p < 0.05).**

Of the Big Five personality traits, extraversion and openness to experience were found to have the strongest and statistically significant effects on ad scepticism, with the effect of extraversion being negative (-0.266^{***}) and the effect of openness to experience being positive (0.254^{***}). In addition, agreeableness and emotional stability were found to have statistically significant, although weaker, effects on ad scepticism, with the effect of agreeableness being negative (-0.081^{***}) and the effect of emotional stability being positive (0.082^{***}). In contrast, the effect of conscientiousness on ad scepticism was found to be statistically not significant (0.022). In turn, of the demographic variables, both age and education were found to have statistically significant and approximately equally strong effects on ad scepticism, with the effect of age being positive (0.156^{***}) and the effect of education being negative (-0.170^{***}). Together, the seven antecedents were found to explain 17.5% of the variance in ad scepticism.

4.4. Effects of ad scepticism on user experience

As for the effects of ad scepticism on user experience, we began the examination of the potential differences in these effects and in the mean scores of user experience by testing measurement invariance, the results of which are reported in Table 4. As shown, the χ^2 test of difference supported the hypothesis on full metric invariance ($\Delta\chi^2(30) = 16.663$, $p = 0.976$). In contrast, it did not support the hypothesis on full scalar invariance ($\Delta\chi^2(30) = 185.252$, $p < 0.001$) but only on partial scalar invariance ($\Delta\chi^2(29) = 38.207$, $p = 0.118$) in which the intercept of UE3 was allowed vary in the case of activity messages. However, this still enabled the comparison of the mean scores of user experience across the groups because the user experience construct was measured by at least one indicator other than the marker indicator that had an invariant loading and intercept across all the groups (Steenkamp & Baumgartner, 1998).

Table 4. Results of invariance testing.

Invariance	χ^2	df	SCF	CFI	TLI	RMSEA	SRMR
Full configural	801.102	212	1.371	0.958	0.948	0.067	0.035
Full metric	843.042	242	1.322	0.957	0.953	0.063	0.038
Full scalar	1,011.101	272	1.288	0.947	0.949	0.066	0.051
Partial scalar (UE3 in AM)	894.628	271	1.289	0.956	0.957	0.061	0.041
Full path	977.606	274	1.285	0.950	0.952	0.064	0.083
Partial path (AS → UE in AM)	927.753	273	1.287	0.953	0.955	0.062	0.059
Partial path (AS → UE in PB)	900.951	272	1.288	0.955	0.956	0.061	0.044

The differences in the mean score of user experience across the groups are reported in Table 5, showing that the mean score was found to be highest in the case of ratings and reviews, second highest in the case of product recommendation systems, second lowest in the case of product badges, and lowest in the case of activity messages. All the found differences were statistically significant. In addition, Table 5 reports for each group the effect of ad scepticism on user experience and the proportion of explained variance (R^2) in user experience by ad scepticism. All the effects were found to be negative and statistically significant, and the effect was weakest in the case of ratings and reviews, second weakest in the case of product recommendation systems, second strongest in the case of product badges, and strongest in the case of activity messages. When testing for the statistical significance of the differences in the effects, the χ^2 test of difference supported the hypotheses on neither full path invariance ($\Delta\chi^2(3) = 114.644$, $p < 0.001$) nor partial path invariance in which the effect was allowed to vary in the case of activity messages ($\Delta\chi^2(2) = 41.601$, $p < 0.001$) or both activity messages and product badges ($\Delta\chi^2(1) = 7.233$, $p = 0.007$). Thus, we can conclude that the differences in the effects are statistically significant across all the four groups.

Table 5. Group differences (*** = p < 0.001).

Group	AS → UE	R^2 in UE	Differences in the mean scores of UE			
			vs. RR	vs. PRS	vs. PB	vs. AM
RR	-0.201^{***}	4.0%	–			
PRS	-0.333^{***}	11.1%	-0.398^{***}	–		
PB	-0.512^{***}	26.2%	-1.163^{***}	-0.765^{***}	–	
AM	-0.644^{***}	41.5%	-1.607^{***}	-1.209^{***}	-0.444^{***}	–

5. Discussion and conclusion

The results of the conducted hypothesis testing are summarised in Table 6, showing that six out of the eight research hypotheses in our research model were supported by the data. As hypothesised, extraversion and agreeableness were both found to have a negative effect on ad scepticism, whereas emotional stability, openness to experience, and age were found to have a positive effect on ad scepticism. In turn, ad scepticism was found to have a negative effect on the user experience of social influence features, with the effect being stronger for the more manipulative social pressure features than for the more neutral social proof features. Among our respondents with relatively high levels of ad scepticism (cf. the indicator scores in Table 3), these stronger negative effects also contributed to the user experience of social pressure features being much more negative than that of social proof features. However, contrary to what we hypothesised, we found conscientiousness to have no statistically significant effect on ad scepticism and the effect of education on ad scepticism to be negative. Obermiller and Spangenberg (1998) hypothesised this latter

effect to be positive based on the reasoning that higher education results in more marketplace experiences. However, higher education is also likely to aid consumers in understanding how online advertising works, which might, in turn, reduce their scepticism toward it.

Table 6. Results of hypothesis testing.

Hypothesis	Supported?
H1: EXT affects AS negatively.	Yes
H2: AGR affects AS negatively.	Yes
H3: CON affects AS positively.	No (no effect)
H4: ES affects AS positively.	Yes
H5: OTE affects AS positively.	Yes
H6: Age affects AS positively.	Yes
H7: Education affects AS positively.	No (negative effect)
H8: AS affects UE negatively, with the effect being stronger for social pressure than social proof features.	Yes

In terms of the Big Five personality traits, especially extraversion and openness to experience were found to have strong effects on ad scepticism. Extraverts are externally focused, with an orientation toward action rather than thought (Watson & Clark, 1997). Individuals who are open to experience also actively seek out experiences, but in contrast to extraverts, they are prone to intellectualising and characterised by the depth and intensity of their consciousness and thoughts (McCrae & Costa, 1997). The outward orientation of both these traits might explain their strong effects, while the difference in the depth of thought is logically reflected in the negative effect of extraversion and the positive effect of openness to experience on ad scepticism. The Big Five personality traits can also be further organised into two themes: *agency*, which comprises extraversion and openness to experience, and *communion*, which comprises agreeableness, conscientiousness, and emotional stability (Digman, 1997; Karwowski & Lebuda, 2016). Agency is characterised by dominance and self-interest, whereas communion is characterised by co-operation and caring for others (Abele & Wojciszke, 2007; Entringer et al., 2022). The tendency of communion toward assimilation versus the tendency of agency toward differentiation might further elucidate, on one hand, the strong effects of extraversion and openness as well as, on the other hand, the statistically not significant effect of conscientiousness on ad scepticism.

From a theoretical perspective, the study makes considerable contributions to both marketing and information systems (IS) research. In terms of marketing research, its findings promote the understanding of especially the role of the Big Five personality traits as antecedents of ad scepticism, which has not been comprehensively and rigorously studied in prior research. In turn, in terms of IS research, its findings promote the understanding of the effects of ad scepticism on the user experience of social influence features, which have also been omitted in prior research. From a practical perspective, the main contribution of the study concerns the potential risks of employing social influence features in online advertising in terms of resulting in more negative user experience. These risks are likely to be most serious in the case of consumers with high levels of ad scepticism and social influence features that utilise the more manipulative social pressure features, such as product badges and activity messages, instead of the more neutral social proof features, such as ratings and reviews as well as product recommendation systems. Thus, these former features should be used with caution by online retailers in their online stores.

6. Limitations and future research

We see this study to have three main limitations. First, its sample was skewed toward male, younger, and more highly educated consumers and consisted mainly of Finnish consumers, which poses limitations for the generalisability of its findings. In addition, due to the way the respondents were recruited, many of them were assumingly students, although this was not specifically inquired in the survey, and we also do not see the potential student status of some of the respondents to result in any notable bias in the findings. Second, the study focused only on four examples of social influence features that are commonly used in online shopping, which also poses additional limitations for the generalisability of its findings. Third, the study examined social influence features only in the case of low-involvement hair care products (i.e., shampoos), which were selected as the examined product category due to their assumed relevancy to most of the respondents and their better suitability for the study setting in comparison to more high-involvement products, in the case of which social influence and social cues typically play a less important part in consumer decision-making. Future research should address all these limitations by replicating the study with more balanced and varied samples as well as more varied study settings in terms of both the examined social influence features and product categories. In addition, future research could also extend the research model of this study with other personality and demographic traits that may act as potential antecedents of ad scepticism, such as cynicism and self-esteem (Obermiller & Spangenberg, 1998) as well as gender.

7. References

Abele, A. E., & Wojciszke, B. (2007). Agency and communion from the perspective of self versus others. *Journal of Personality and Social Psychology*, *93*(5), 751–763.

Acaray, A., & Yildirim, S. (2017). The impact of personality traits on organizational cynicism in the education sector. *World Journal of Entrepreneurship, Management and Sustainable Development*, *13*(1), 65–76.

Benlian, A., Titah, R., & Hess, T. (2012). Differential effects of provider recommendations and consumer reviews in e-commerce transactions: An experimental study. *Journal of Management Information Systems*, *29*(1), 237–272.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*(3), 588–606.

Chaudhary, V., Sharma, D., & Kalro, A. D. (2019). Consumer scepticism: A systematic review of literature. *Marketing Review*, *19*(3–4), 189–212.

Clark, L., & Çallı, L. (2014). Personality types and Facebook advertising: An exploratory study. *Journal of Direct, Data and Digital Marketing Practice*, *15*(4), 327–336.

Digman, J. M. (1997). Higher-order factors of the Big Five. *Journal of Personality and Social Psychology*, *73*(6), 1246–1256.

Entringer, T. M., Gebauer, J. E., & Paulhus, D. L. (2022). Extracting agency and communion from the Big Five: A four-way competition. *Assessment*, *29*(6), 1216–1235.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50.

Gefen, D., Rigdon, E. E., & Straub, D. (2011). Editor's comments: An update and extension to SEM guidelines for administrative and social science research. *MIS Quarterly*, *35*(2), iii–xiv.

Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, *37*(6), 504–528.

Ha, L. (2008). Online advertising research in advertising journals: A review. *Journal of Current Issues & Research in Advertising*, *30*(1), 31–48.

Hair, J. F., Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate data analysis* (8th ed.). Cengage.

Hirsh, J. B., Kang, S. K., & Bodenhausen, G. V. (2012). Personalized persuasion: Tailoring persuasive appeals to recipients' personality traits. *Psychological Science*, *23*(6), 578–581.

Hu, L.-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55.

John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 114–158). Guilford Press.

Karwowski, M., & Lebuda, I. (2016). The Big Five, the Huge Two, and creative self-beliefs: A meta-analysis. *Psychology of Aesthetics, Creativity, and the Arts*, *10*(2), 214–232.

Laugwitz, B., Held, T., & Schrepp, M. (2008). Construction and evaluation of a user experience questionnaire. In A. Holzinger (Ed.), *Proceedings of the 4th Symposium of the Workgroup Human-Computer Interaction and Usability Engineering of the Austrian Computer Society on HCI and Usability for Education and Work* (pp. 63–76). Springer.

Lee, J. (2015). User response to app install advertising: The role of ad skepticism. In *Proceedings of the 15th International Conference on Electronic Business* (pp. 497–500). Association for Information Systems.

Lee, J. K., Lee, S.-Y., & Hansen, S. S. (2017). Source credibility in consumer-generated advertising in YouTube: The moderating role of personality. *Current Psychology*, *36*(4), 849–860.

Li, C.-Y. (2013). Persuasive messages on information system acceptance: A theoretical extension of elaboration likelihood model and social influence theory. *Computers in Human Behavior*, *29*(1), 264–275.

McCrae, R. R., & Costa, P. T., Jr. (1997). Conceptions and correlates of openness to experience. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 825–847). Academic Press.

McCrae, R. R., & Costa, P. T., Jr. (2008). The five-factor theory of personality. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 159–181). Guilford Press.

McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, *60*(2), 175–215.

McCreery, S., & Krugman, D. M. (2017). Tablets and TV advertising: Understanding the viewing experience. *Journal of Current Issues & Research in Advertising*, *38*(2), 197–211.

Messer, U., Leischnig, A., & Distler, E. (2017). Proof or pressure? How visitor traffic disclosure impacts online shopper behavior. In *Proceedings of the 38th International Conference on Information Systems*. Association for Information Systems.

Moscato, D., & Hopp, T. (2019). Natural born cynics? The role of personality characteristics in consumer skepticism of corporate social responsibility behaviors. *Corporate Reputation Review, 22*(1), 26–37.

Muthén, L. K., & Muthén, B. O. (2023). *Mplus home page*. https://www.statmodel.com

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

Obermiller, C., & Spangenberg, E. R. (1998). Development of a scale to measure consumer skepticism toward advertising. *Journal of Consumer Psychology*, *7*(2), 159–186.

Orth, U. R., Malkewitz, K., & Bee, C. (2010). Gender and personality drivers of consumer mixed emotional response to advertising. *Journal of Current Issues & Research in Advertising*, *32*(1), 69–80.

Oyibo, K., & Vassileva, J. (2019). The relationship between personality traits and susceptibility to social influence. *Computers in Human Behavior*, *98*, 174–188.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903.

Robins, R. W., Tracy, J. L., Trzesniewski, K., Potter, J., & Gosling, S. D. (2001). Personality correlates of self-esteem. *Journal of Research in Personality*, *35*(4), 463–482.

Roccas, S., Sagiv, L., Schwartz, S. H., & Knafo, A. (2002). The Big Five personality factors and personal values. *Personality and Social Psychology Bulletin*, *28*(6), 789–801.

Roethke, K., Klumpe, J., Adam, M., & Benlian, A. (2020). Social influence tactics in e-commerce onboarding: The role of social proof and reciprocity in affecting user registrations. *Decision Support Systems*, *131*, 113268.

Satorra, A., & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika*, *66*(4), 507–514.

Schneider, D., Klumpe, J., Adam, M., & Benlian, A. (2020). Nudging users into digital service solutions. *Electronic Markets*, *30*(4), 863–881.

Statista. (2023). *Digital advertising worldwide – statistics & facts*. https://www.statista.com/topics/7666/internet-advertising-worldwide/

Steenkamp, J.-B. E. M., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research*, *25*(1), 78–90.

Tan, S.-J., & Tan, K.-L. (2007). Antecedents and consequences of skepticism toward health claims: An empirical investigation of Singaporean consumers. *Journal of Marketing Communications*, *13*(1), 59–82.

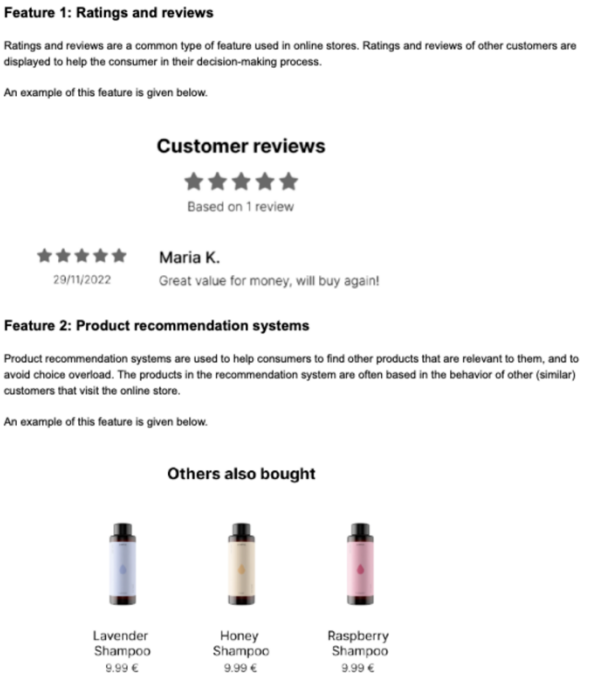
Uribe, R., Labra, R., & Manzur, E. (2022). Modeling and evaluating the effectiveness of AR advertising and the moderating role of personality traits. *International Journal of Advertising*, *41*(4), 703–730.

Wang, Y., Meister, D. B., & Gray, P. H. (2013). Social influence and knowledge management systems use: Evidence from panel data. *MIS Quarterly*, *37*(1), 299–313.

Watson, D., & Clark, L. A. (1997). Extraversion and its positive emotional core. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 767–793). Academic Press.

Yang, J., Jiang, M., & Wu, L. (2021). Native advertising in WeChat official accounts: How do ad–content congruence and ad skepticism influence advertising value and effectiveness? *Journal of Interactive Advertising*, *21*(1), 17–33.

Appendix A: Social influence features



Appendix B: Item wordings

Item	Wording
AS1*	We can depend on getting the truth in most advertising.
AS2*	Advertising's aim is to inform the consumer.
AS3*	I believe advertising is informative.
AS4*	Advertising is generally truthful.
AS5*	Advertising is a reliable source of information about the quality and performance of products.
AS6*	Advertising is truth well told.
AS7*	In general, advertising presents a true picture of the product being advertised.
AS8*	I feel I have been accurately informed after viewing most advertisements.
AS9*	Most advertising provides consumers with essential information.
UE1	I found this feature annoying vs. enjoyable.
UE2	I found this feature unlikable vs. pleasing.
UE3	I found this feature impractical vs. practical.
EXT1	I see myself as extraverted, enthusiastic.
EXT2*	I see myself as reserved, quiet.
AGR1*	I see myself as critical, quarrelsome.
AGR2	I see myself as sympathetic, warm.
CON1	I see myself as dependable, self-disciplined.
CON2*	I see myself as disorganised, careless.
ES1*	I see myself as anxious, easily upset.
ES2	I see myself as calm, emotionally stable.
OTE1	I see myself as open to new experiences, complex.
OTE2*	I see myself as conventional, uncreative.

* = reverse-worded item