Identifying Instagram user segments based on privacy perceptions and attitudes towards online behavioral advertising

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Abstract

The evolution of the digital advertising and the effectiveness of personalised marketing are creating new challenges for advertisers, especially in the areas of privacy concerns and the need for relevant content. The aim of this research is to explore how Instagram users' attitudes towards personalised advertising and privacy perceptions differ from each other. The following six segments were identified through a cluster analysis: non-targeted skeptics, knowledgeable data providers, concerned data protectionists, resigned accepters, over-targeted haters, and non-utilitarian ad supporters. The research highlights that the effectiveness of data-driven advertising depends not only on the technical implementation, but also on the perception and control of users over data use. Precise targeting is not enough for the success of future digital marketing: it is important to ensure user satisfaction through authentic communication and real choices.

Keywords: online behavioral advertising, privacy, cluster analysis

Track: marketing communication (including digital) and branding

1. Introduction

With the rapid development of data-driven marketing and technologies that make data collection and use more efficient, users' online activity can now be monitored to a significant extent. While this has led to more precise ad targeting and allowing users to interact with more relevant marketing communications (Somosi, Hajdú, and Molnár, 2023), there is a downside to the significant use of data. Part of the users have been raising more questions about data security, especially regarding social media advertising on Facebook and Instagram (Boerman, Kruikermeier, and Borgesius, 2017). The so-called personalization-privacy paradox thus describes the demand for personalized ads due to relevant content and in parallel negative attitudes towards excessive data use (Gironda & Korgaonkar, 2018). This contradiction between relevancy and privacy concern is most often observed in the case of online behavioral advertising due to its high level of data requirement as it is *"the practice of monitoring people's online behavior and using the collected information to show people individually targeted advertisements"* (Boerman et al., 2017, p. 364).

Although several studies refer to the personalization-privacy paradox, most of them aims to measure the relationships between different ad and privacy related variables and thus try to model the paradox (Kokolakis, 2017). On the other hand, the current literature has not revealed studies yet that would identify and examine the different user segments based on their privacy related features which would help to deeper understand the phenomena of the paradox. The current study aims to fill in this gap by answering the question: What user segments can be identified based on their privacy perceptions and attitudes towards online behavioral advertising in the context of Instagram?

2. Theoretical Background

Based on recent publications, the most frequently used variables to examine the personalization-privacy paradox in the context of online behavioral advertising are perceived personalization and intrusiveness, privacy concern, information control and attitudes towards advertising (Sikó, 2023). It indicates that these variables might serve as a reliable base for the segmentation of the users as well.

2.1 Perceived personalization

Although online advertising can be personalized in several ways on the practical side (Somosi et al., 2023), from a scientific point of view, the starting point is to examine whether users perceive targeting at all and, if so, to what extent (Odoom, 2022). Perceived personalization thus refers to the extent to which the users feel that the advertisement displayed to them matches their own personality, preferences, or even online activities (De Groot, 2022), which may of course differ from the actual degree of personalization. Odoom (2022) examined that the perceived level of personalization in display advertising increases online purchase intentions. In addition, positive changes have been identified in general attitudes towards advertising with an increase in perceived personalization (De Groot, 2022).

2.2 Perceived intrusiveness

Perceived intrusiveness is one of the most frequently researched cognitive responses to personalized ads (Morimoto, 2021). Perceived intrusiveness of an online advertisement typically refers to the extent to which the advertisement has interrupted the users in their current digital activities (Gironda & Korgaonkar, 2018) or the cognitive process that is currently taking place (Odoom, 2022). Research has shown that such a sequence of events can lead to negative feelings in users, as an encounter with an ad based on personal data can trigger several thoughts or even concerns in consumers. However, perceived intrusiveness is not only influenced by the level of personalization in a positive way but can also have a negative impact on purchase (Odoom, 2022) or click-through intentions (Gironda & Korgaonkar, 2018).

2.3 Privacy concern

Privacy concern is understood as the concern of users that their privacy may be violated due to the data collection practices of websites and social media platforms (Morimoto, 2021). The main reason for this is that data collection and use often becomes opaque and untraceable, creating a sense of anxiety (Mpinganjira & Maduku, 2019). Research has shown that higher levels of perceived personalization in display advertising increase privacy concerns (Odoom, 2022). These concerns may also have a positive effect on the perceived intrusiveness of ads (Mpinganjira & Maduku, 2019; Morimoto, 2021).

2.4 Information control

Information or privacy control is a characteristic of users representing the feeling of having an influence on the use of their personal data (Gironda & Korgaonkar, 2018). Since a

person's information control can be considered a personality trait or even a cognitive state, it is characterized by strong context dependence (Mpinganjira & Maduku, 2019). Stronger information control of a user is proofed to increase the sense of intrusiveness induced by advertisements. In addition, research has also pointed out that privacy concerns are in turn negatively affected by information control (Gironda & Korgaonkar, 2018; Mpinganjira & Maduku, 2019; Morimoto, 2021).

2.5 Attitude towards advertising

The outcome of variables related to online behavioral advertising are typically examined as either general attitudes towards advertising or behavioral intention (e.g. click or purchase intention). In the present study, general attitudes towards advertising are considered as it allows for more precise inferences to be drawn for a deeper understanding of privacy aspects (Morimoto, 2021).

3. Methodology and Sample

The aim of the study was to identify different user segments amongst the Instagram users based on their privacy perceptions and attitudes towards online behavioral advertising. A questionnaire based on 7-point validated scales of the above discussed variables was used to formulate the segments. The sample consisted of a total of 134 Instagram users, of which 76.87% were female. Based on the number of variables (28), this sample size is sufficient for cluster analysis. 72.39% of the respondents were aged between 20-29 years, which fits well with the typical user base of Instagram. 63.43% of the respondents have a higher education degree, followed by high school graduates (26.12%).

For the measurement of perceived personalization, a 6-item scale was used based on Odoom (2022). In the case of perceived intrusiveness, a 7-item scale was applied (Mpinganjira & Maduku, 2019; Odoom, 2022). For privacy concerns, the scale based on the work of Odoom (2022) and Morimoto (2021) was used. In the case of information control, a validated scale with four items was used (Mpinganjira & Maduku, 2019; Gironda & Korgaonkar, 2018). Finally, in the case of attitude towards advertising, a 6-item semantic differential scale was applied (Morimoto, 2021).

Prior to the cluster analysis, a confirmatory factor analysis based on principal component analysis was performed to explore the data structure and to evaluate the aggregability of variables into factors. Before the analysis, the suitability of the variables was

checked using the Bartlett's sphericity test and the Kaiser-Meyer-Olkin (KMO) index. The result of the Bartlett's test was significant (sig<0.001), while the KMO indicator was found to have a value of 0.817, which is considered excellent for the suitability (Mulaik, 2009).

During the factor analysis, two variables were excluded due to low information retention. After cleaning, the communality value for all remaining variables exceeded the threshold of 0.4 indicating adequate information content preservation. Based on the total variance explained, six components were formed using the Kaiser criterion (Mulaik, 2009) which together explained 72.51% of the variance of the original variables. Based on the literature and the content of the items, they were named as privacy concern, perceived intrusiveness, perceived ad personalization, information control, ad attitude and perceived usefulness. The latter factor was differentiated from the items of the ad attitude scale, indicating that the perception of the usefulness of advertisements can be interpreted as a standalone psychological dimension (Table 1).

Table 1. Rotated factor weight matrix

Questions involved in the study (variables)	Factors					
	privacy concern	perceived intrusive-ness	perceived ad persona-lization	information control	ad attitude	perceived usefulness
When I see personalized Instagram ads based on my previous online activities, I am concerned about my privacy.	0,897					
When I see personalized Instagram ads based on my previous online activities, I am concerned that business have too much information about me.	0,855					
When I see personalized Instagram ads based on my previous online activities, I am concerned about misuse of personal information.	0,832					
When I see personalized Instagram ads based on my previous online activities, I am sensitive about giving my information.	0,831					
When I see personalized Instagram ads based on my previous online activities, I feel information is shared without permission.	0,788					
I think Instagram advertisements that are based on my previous online activities are disturbing.	0,517					
I think Instagram advertisements that are based on my previous online activities are invasive.		0,865				
I think Instagram advertisements that are based on my previous online activities are intrusive.		0,820				
I think Instagram advertisements that are based on my previous online activities are interfering.		0,815				
I think Instagram advertisements that are based on my previous online activities are forced.		0,764				
I think Instagram advertisements that are based on my previous online activities are obtrusive.		0,581				
The Instagram ads I see are tailored to my shopping situation.			0,836			
The Instagram ads I see seem to reflect my needs.			0,825			
The Instagram ads I see target me as a unique individual.			0,780			
The Instagram ads I see seem to be designed specifically for me.			0,739			
The Instagram ads I see online seem personal to me.			0,718			
I believe I have control over which of my personal information is accessible to the websites that I visit.				0,892		
I believe I can use privacy controls to control the personal information that websites obtain from the online activities that I perform.				0,855		

I think I have control over how my personal information is used by websites that obtain information from the online activities that I perform.				0,808		
I believe that I have control over who can track the online activities I perform.				0,774		
I think personalized Instagram advertising based on my previous online activities is pleasant/unpleasant.					0,719	
I think advertisements that are based on my previous online activities are distracting.					0,683	
I think personalized Instagram advertising based on my previous online activities is good/bad.					0,636	
I think personalized Instagram advertising based on my previous online activities is favorable/unfavorable.					0,547	
I think personalized Instagram advertising based on my previous online activities is informative/uninformative.						0,794
I think personalized Instagram advertising based on my previous online activities is interesting/boring.						0,721

Relying on the six dimensions identified, a cluster analysis was conducted to segment the respondents. The Ward hierarchical clustering procedure was used which aims to minimise the increase in variance between clusters and is widely used in marketing research (Jain, Murty, and Flynn, 1999). Based on the agglomeration schedule and the dendrogram, the six-cluster solution was found to be optimal. The resulting clusters were named based on the mean values calculated along each factor.

4. Results

After performing cluster analysis with the latent variables, an additional cross-tabulation analysis was also run with variables not involved in the cluster analysis. The Phi values showed that there are strong relationships between cluster membership and Instagram usage frequency (0,544), perceived frequency of encountering an ad on Instagram (0,324), age (0,519) and highest level of education (0,387) and a moderate relationship between cluster membership and gender (0,213). Based on these two analyses, the six clusters can be characterized as follows (Table 2).

Table 2. Mean values of factors in each cluster and cross-tabulation results

		Non-targeted skeptics	**Knowledgeable data providers**	**Concerned data protectionists**	**Resigned accepters**	**Over-targeted haters**	**Non-utilitarian ad supporters**
	N	29	32	24	12	19	18
Variables involved in cluster analysis	Privacy concern	-0.03 ~	0.01 ~	1.05 ++	-1.06 --	-0.04 ~	-0.63 not int.
	Perceived intrusiveness	-0.25 not int.	0.02 ~	-0.49 -	-0.13 not int.	0.24 not int.	0.86 +
	Perceived ad personalization	-1.2 --	0.15 +	0.42 +	0.77 +	0.93 +	-0.38 -
	Information control	-0.41 -	0.73 +	-0.38 -	-1.21 --	0.35 +	0.3 not int.

	Ad attitude	-0.39 -	0.52 +	0.56 +	0.01 ~	-1.51 --	0.53 +
	Perceived usefulness	0.35 not int.	0.6 +	-0.2 -	-0.1 -	-0.13 -	-1.16 --
Variables not involved in cluster analysis	Instagram usage frequency (82.1% serveral times a day)	72.4% -	93.8% +	79.2% -	58.3% -	58.3% +	94.4% +
	Perceived frequency of encountering an ad on Instagram (41.0% always)	51.7% +	31.3% -	33.3% -	41.7% ~	31.6% -	61.1% +
	Gender (76.9% woman)	86.2% +	75.0% -	75.0% -	58.3% -	68.4% -	88.9% +
	Age (44.0% 20-24 years)	48.3% +	40.6% -	33.3% -	33.3% -	57.9% +	50.0% +
	Highest level of education (63.4% higher education degree)	51.7% -	62.5% -	66.7% +	75.0% +	63.2% ~	72.2% +

Note: ~: averagely typical, +: more typical than average, -: less typical than average; not int.: not interpretable due to high standard deviation

Segment 1: Non-targeted skeptics. This group (N=29) shows an average level of privacy sensitivity, but at the same time strongly states that they do not receive personalized advertising. They have a negative attitude towards targeted advertising, suggesting that their rejection is rather based on the resiliance towards irrelevant ads than conscious privacy considerations. Although the sense of information control is low, it does not give rise to serious concerns, which is consistent with low data protection sensitivity. The members of this segment typically spend less time on Instagram and states that they see more ads compared to the whole sample. In this segment women and 20-24 years old responders are overpresented while higher education degree is the least typical compared to the sample.

Segment 2: Knowledgeable data providers. This cluster (N=32) has the most balanced and conscious attitude towards targeted advertising. Members show an average level of privacy concern, but the highest sense of information control, indicating that they are the most conscious of their personal data. Their attitudes towards advertising are characterised by moderate positivity, accepting personalized advertising as they perceive it as relevant and helpful rather than distracting. This segment seems to be the only one sensing more than average usefulness. They are users who make a conscious trade-off between advertising and the use of their data. Probably due to the above, the members of this segment spend more time on Instagram and perceive a smaller amount of advertisement. Typically, the members of this segment is a bit older but considering gender and education level the distribution is close to the sample average.

Segment 3: Concerned data protectionists. This group (N=24) shows the strongest sensitivity to data protection in the form of privacy concern. They do not typically find advertising intrusive and sense a moderate level of targeting. Still, they consider targeted

advertising rather positive which may indicate that they might enjoy the (most probably entertainment) benefits of targeted ads if it does not undermine privacy rights. The sense of control over information is low, confirming that the group is concerned about the lack of autonomy over their data. The usefulness of advertising is rated moderately negatively, consistent with their distrust of advertising. Compared to the whole sample, this group spends less time on Instagram and meets a lower number of ads during this time. The members tend to be older and more educated compared to the sample.

Segment 4: Resigned accepters. This group (N=12) has the lowest privacy concern, but they also feel the lowest level of control over their personal data, while they are exposed to almost the highest level of targeted advertising. The very low sense of control over information suggests that they tolerate the presence of targeted online advertising, while their attitudes towards advertising are neither positive nor hostile. The usefulness of advertising is also not rated highly but is not rejected. This cluster tolerates rather than actively shapes. Out of all segments, this group spends generally the smallest time on Instagram but still is exposed to nearly as many ads as the whole sample generally. This segment represents the lowest ratio of women and the highest with higher education degree.

Segment 5: Over-targeted haters. Members of this cluster (N=19) show average privacy concern but perceive to be exposed to the highest level of targeting. The sense of information control is moderate, but this does not dampen the strong rejection and negative attitude towards targeted advertising that is the lowest of all segments. The usefulness of advertising is rated negatively, which is consistent with a negative attitude system. This segment typically spends more time on Instagram but faces a smaller number of ads. This cluster contains the most 20-24 years olds and less women compared to the whole sample.

Segment 6: Non-utilitarian ad supporters. This cluster (N=18) has a positive view of advertising, even if they sense a lower level of personalization and it seems to be the least useful to them compared to the other segments. It implies that their positive attitude is not based on utility but rather on aesthetic, emotional or other subjective factors. The distraction of advertising is the highest, but this does not diminish their overall support. The contradictions are what make this cluster truly interesting as useless and intrusive non-targeted ads still result in positive ad attitude. This group spends the most time on Instagram and meets the most ads as well. It also represents the most women and second to most responders with higher education degree.

5. Conclusion

The results of the cluster and cross-tabulation analysis show that Instagram users' attitudes towards advertising and privacy are organised in a complex way. The six segments identified represent essentially different privacy views and advertising interpretations. It is noteworthy that the attitude towards targeted advertising is not necessarily driven by privacy concerns. For example, non-targeted skeptics and over-targeted haters are also dismissive, but for different reasons: the former perceive irrelevance, the latter over-targeting. This suggests that targeting is not a value in itself, but that its accuracy and fit with the user experience is more of a decisive factor. Thus, positive advertising attitude does not automatically follow from personalization - indeed, the example of non-utilitarian ad supporters shows that subjective, even aesthetic or emotional, considerations might override a rational sense of utility. A similar dichotomy can be observed among concerned data protectionists, who, although highly concerned about their data security, are able to find positives in targeted advertising. The segment of knowledgeable data providers is an important target group, as they are the ones who understand data-driven operations and are willing to accept relevant content in return, provided they feel in control of their own data. Conversely, the low sense of control and passivity of resigned accepters raises questions about the extent to which their consent can be considered informed, or whether it is more a case of acquiescence based on acceptance of the digital environment.

Demographic differences, especially along age, gender and educational level, also suggest that reactions to targeted advertising are not universal but culturally and socially embedded. Overall, the research confirms that the effectiveness of data-driven advertising depends not only on the technical implementation, but also on how users perceive their own role and control in the process of data use. For future digital marketing, it will be crucial to not only target accurately, but also to communicate authentically and offer users real choices.

The main limitation of the research is the size and composition of the sample, which limits the generalisability of the results. In addition, the range of variables included in the study also limits the number and characteristics of the resulting segments, so it is possible that certain types of users were not identified. In future research, it would be worthwhile to repeat the study with a larger and more diversified sample and to gain a deeper and more accurate picture of segments among Instagram users by including additional relevant variables.

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