Too Much Information?

The Impact of Personalized Instagram Ads on Gen Z's Privacy Attitudes and Data Sharing Behaviors

Student Name: Zoe Bandell
Student Number: 740863

Supervisor: Dr. Freya De Keyzer

MA Media & Business
Erasmus School of History, Culture and Communication
Erasmus University Rotterdam

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ABSTRACT

This paper examines the extent to which the level of personalization within advertisements on Instagram affects the privacy concerns of Gen Z users. The study also explores the mediating roles of perceived creepiness and perceived relevance on the relationship between personalization privacy concerns. This study employs a survey experiment method, utilizing a three-level between-subjects experimental design. Here, three conditions were presented to participants as fictitious ads and scenarios, attempting to mimic personalized Instagram ads. These ads were then split into three groups: high, moderate, and non-personalized ads. These levels were constructed using three distinct elements of personalization: interests, location, and age. Where the highly personalized condition portrayed all three elements, the moderate only made use of the middle element, location, and the non-personalized one did not include any. Participants of this survey were asked about their privacy concerns, data sharing behaviors, their perceived creepiness, and perceived relevance after viewing the given scenario and ad. Additionally, they were questioned on some potential confounding variables as well, including their general online privacy concerns, Instagram (brand) trust, and sustainability efforts, as well as certain sociodemographics. To test the relationships between these variables, ANOVA, regression, and PROCESS macro mediation (Model 4) analyses were employed. The study found a positive association between personalization and privacy concerns, with increasing levels of personalization leading to greater privacy concerns. Only high levels of personalization significantly influenced perceived creepiness, which was also positively linked to privacy concerns. The mediating effect of perceived creepiness was partial, present only through indirect effects. Perceived relevance showed partial significance, with only high personalization presenting significant results, while low vs moderate levels did not. Interestingly, perceived relevance did not reduce privacy concerns; instead, it appeared to increase them after participants viewed the ads, suggesting the opposite of what was expected. Following these findings, heightened privacy concerns notably influenced participants' reluctance to share their data. The results indicated a clear tipping point between moderate and high personalization, as most of the differences between these levels were significant, and not between moderate and low levels. Theoretical and societal implications are discussed, along with the study's limitations and future recommendations.

KEYWORDS: *Personalization, Privacy Concerns, Reluctance to Data Sharing, Perceived Creepiness, Perceived Relevance*

TABLE OF CONTENTS

1. Introduction

Alongside the technological evolution of the Internet, the rise of social media has become a significant part of people's daily lives (De Keyzer et al., 2022, p. 39). As of April 2025, it was calculated that 5.31 billion people use social media, representing more than half of the global population (DataReportal, 2025). As defined by Singh and Diamond (2020, p. 8), the phenomenon of social media is characterized by the content created and shared by individuals through accessible technologies, such as social networking platforms. Some of the most popular platforms in today's day and age are Facebook, YouTube, Instagram, WhatsApp, and TikTok, in this order (Statista, 2025), with Instagram being the most commonly used social media platform among Gen Z users (Statista, 2024). Although Instagram was created for users to share and edit photos, like one another's posts, and, in general, create a social network to interact with, it has also developed into a powerful marketing tool (Evans, 2018). Since its exponential growth, businesses have begun making use of the social media landscape, "allocating greater portions of their media budgets to social media" as it has become instrumental in helping market products to a vast online audience (Knoll, 2016, p. 266). Online brand communication manifests itself in numerous types of social media marketing, for example, brand or business accounts or the use of influencers. Nevertheless, the most notable practice among these is the use of personalized advertisements. As explained by Boerman et al. (2021, p.2), the personalization of advertisements "involves incorporating elements in a message that refer to each recipient and are based on the recipient's characteristics and information." In other words, advertisements are created for specific individuals using their personal data which are then deliberately targeted at these users. Businesses most commonly format these social media adverts in the shape of standard display ads wherein visuals, text, and URL links are combined and displayed in a user's feed in order to easily provide accessible information to users (Choi et al., 2020, p. 556; Mailchimp, n.d.; Malheiros et al., 2012, p. 579). These advertisements, combined with the personalization and targeting of content, allow brands to stand out among the overwhelming and chaotic amount of content constantly being produced online, thereby helping their message to be noticed by the targeted individuals (De Keyzer et al., 2024, p. 1206). The information used to personalize these ads is most commonly collected and purchased from what is known as Big Data, referring to the immense amount of information collected from users of social media or the Internet (Santesteban & Longpre, 2020, p. 460). Within the field of market research, Big Data is used to help firms create connections with users and potential customers as they use the collected data to personalize advertisements to specific target audiences, which can help "increase the attention consumers pay to an ad or enhance response rates" (Grewal et al., 2016, p. 98). This collection is most commonly done through online activity monitors and trackers, where the information is then sold to third parties, who use the collected data to create advertisements. The tailored ads are then posted on social media, specifically targeting individuals who have shared their information,

as seen in the collected Big Data sets (Katz, 2019, p. 696; Kim et al., 2022, p. 2; Nunez-Barriopedro et al., 2022, p. 311).

1.1 Relevance

Big Data has, therefore, been deemed one of the most valuable commodities of the 21st century. Especially for advertisers, the collection of Big Data allows them to tailor advertisements and products to individuals, which in turn generates greater sales (Pridmore & Hämaäläinen, 2017, p. 108). The use of such surveillance technologies and the collection of data for commercial benefits is also known as surveillance capitalism. As highlighted by Zuboff (2019, p. 4), surveillance capitalism transforms human experience into behavioral data, using it to create predictive products sold in future markets for profit. The outcomes of using this information differ drastically among online users. Initially, users may find advertisements that use their personal data to be highly beneficial, as these ads are personalized to predict their needs and desires by showing them products representative of their online behavior, demographics, and other characteristics (De Keyzer et al., 2022, p. 138). However, on the other hand, personalization can simultaneously have negative effects on its targets, as users may not want their data surveilled or shared online, leading them to ignore the ad (White et al., 2008, p. 41; Kim & Huh, 2017, p. 93). This dilemma is more commonly known as the personalization paradox (Aguirre et al., 2015, p. 35). As defined by Aguirre et al. (2015, p. 35), the personalization paradox highlights the idea that despite evidence that personalization can benefit both the advertiser and consumer, it can at the same time cause consumer discomfort and reduce engagement, making it both an "effective and ineffective marketing strategy depending on the context". While previous studies have extensively examined the effects of this paradox on brand attitudes, purchase intentions, and click-through rates (Zahirovic et al., 2024, p. 54; Boerman et al., 2021, p. 2; Kim et al., 2022, p. 3), fewer have explored how these ads shape users' attitudes regarding privacy concerns and their effects on data-sharing behaviors. This study, therefore, addresses this gap through Gen Z, a generation that grew up with social media and the normalcy of data collection, and their favorite social media platform, Instagram.

As the personalization of advertisements has become such a widespread practice, the discourse surrounding users' privacy has also grown exponentially in the past couple of years. This is especially evident in the privacy regulations presented in the European Union's General Data Protection Regulation (GDPR) and California's Consumer Privacy Act (CCPA). Although they differ, both aim to provide users with greater control and security over their personal data and require companies to be transparent about how they collect and use the data (CookieYes, 2024). As this does acknowledge issues surrounding a need for online privacy, these controls are currently only present in California and Europe and remain quite

limited throughout the rest of the world. This, therefore, emphasizes the growing concerns surrounding data protection and privacy despite the increased use of and desire for personalization.

In addition to these regulations, the increasing discourse surrounding tech giants and their association with the current United States President, Donald Trump, may also impact people's perception of privacy on online platforms, as well as their willingness to use them in general (Morrow, 2025). As images surfaced of Mark Zuckerberg, CEO of Meta, at Trump's second inauguration in January 2025, many users expressed their discontent with the bond between the two. Similarly, Elon Musk's relationship with Trump led users to delete their accounts from X, as many felt uneasy about him having access to their data (Jones, 2024). As politics within social media, especially throughout the United States, have become highly polarized, the personalization of advertisements on social media platforms whose CEOs have a personal relationship with the controversial government can cause heightened concerns about data ownership and security, especially when confronted with personal information in these advertisements.

1.2 Research Question

Given the rise of personalized advertising and data-driven marketing strategies in contemporary society, as well as the current political discourse surrounding personal data regulations and ownership rights, understanding the effects on their targets is crucial in determining the best strategy for businesses to approach their advertisements, as well as for policymakers to implement controls. This paper, therefore, presents the following question:

To what extent does personalized advertising on Instagram influence Gen Z consumer privacy concerns and their data-sharing behaviors?

1. *To what extent do positive perceptions (i.e., perceived relevance) of personalized advertisements on Instagram influence Gen Z privacy concerns and, in turn, their data-sharing behaviour?*
2. *To what extent do negative perceptions (i.e., perceived creepiness) of personalized advertisements on Instagram influence Gen Z privacy concerns and, in turn, their data-sharing behaviour?*

2. Theoretical Framework

This chapter highlights the existing literature relevant to this study and, in doing so, builds a conceptual framework for the paper. This framework aims to address the psychological and behavioral processes associated with personalized advertisements. Building upon key concepts such as privacy concerns and data-sharing behaviors, as well as examining perceived relevance and perceived creepiness, the framework aims to address the ideal middle ground for marketers, policymakers, academics, and even consumers to discuss the field of personalization. Here, the following sections explore the core constructs of the study, present justification for the proposed hypotheses, as well as visualize a conceptual model that guides this analysis.

2.1 Personalized Advertising and Consumer Attitudes

Personalized advertising has become a dominant strategy in digital marketing, particularly on social media, as user data is continually being leveraged to create targeted advertisements (Kim & Huh, 2017, p. 92). This information is employed in various ways, as highlighted by De Keyzer et al. (2022, p. 138), "consumers can be addressed based on their name, browsing behavior, social ties, groups and preferences, and all possible combinations of such personal information." Additionally, as highlighted by Jung (2017, p. 304), "gender, age, schools that users graduated from, language, job title, living and workplaces, interests, and friends" are also used for these ads. Within this context, the research conducted by De Keyzer et al. (2022, p. 16) suggests that personal interests, location, and age are the three most important elements that elicit the perceived personalization of these ads. Here, interests are first in line in terms of importance for perceived personalization in advertising as they are most closely tied to personal identity (De Keyzer et al., 2022, p. 6). Location, the second most perceived personalized element, follows interests due to its situational relevance and visibility to users (De Keyzer et al., 2022, p. 5). Lastly, age represents the third most important determinant of perceived personalization, as it addresses user's needs particularly for age-specific products (De Keyzer et al., 2022, p. 5). Personalization is thereby constructed as a continuum, with varying degrees of personalization used throughout advertisements. These different combinations of personalization elements highlight a common technique for manipulating different levels of personalization, as these varying personalization elements have been shown to produce distinct levels of perceived personalization (De Keyzer et al., 2022, p. 143). This practice of personalization within advertisements is exponentially increasing in the realm of marketing and advertising research as user data continues to be shared and collected. Its effectiveness, however, at any level, is conflicted throughout research.

On the one hand, research suggests that personalized advertisements are more effective than non-personalized ones (Boerman et al., 2021, p.1). As personalized ads are utilized to predict the wants

and needs of users, a higher level of personalization makes them more relevant, helpful, and informative to online consumers (Boerman et al., 2021, p.1). Additionally, the benefits for marketers are also highlighted by the idea that such ads are more memorable, attract more attention, and can even spark behavioral changes in their targets (De Keyzer et al., 2022, p. 139; Boerman et al., 2021, p. 1). Previous studies suggest that these behavioral changes primarily manifest in the form of purchasing intentions or attitudes toward a brand (Kim et al., 2022, p. 4; Spears & Singh, 2004, p. 54). The idea of social contract theory can also help in explaining the effectiveness of personalized ads. Initially coined from the works of Enlightenment thinkers such as Locke, Hobbes, and Rousseau, this theory loosely highlights an agreement between a society and its state based off trust, wherein individuals voluntarily agree to establish a government and follow its rules in order to protect their natural rights and collective interests (Tamang, 2023, p. 1959). A more modern approach explains this in regards to users who are active on social media platforms, who thereby allow their personal data to be collected in order to receive the benefits, and thereby enter an unspoken contract that builds trust between the user and the platform (Kim et al., 2022, p. 3; Boerman et al., 2021, p. 3). However, managing personal content can be demanding for firms, as it "requires substantial cognitive effort and time" and, if not done correctly or carefully enough, can cause safety risks for the users who have trusted these firms (Kim et al., 2022, p.3). This can, therefore, also raise concerns among users about the security and privacy of their data (Kim et al., 2022, p. 3).

These concerns present the notion that the personalization of ads can, at the same time, be a restrictive and challenging marketing strategy, especially online. Studies have shown that personalized content used in advertisements can also generate negative feelings, such as anxiety, perceived creepiness, and perceived intrusiveness (Kim et al., 2022, p. 3; De Keyzer et al., 2022, p. 140). This can make personalized advertisements irrelevant to users and unsuccessful, as they may be rejected, ignored, or blocked by their intended targets (De Keyzer et al., 2015, p. 126; White et al., 2008, p.41). As a result, personalization also has the potential to reverse its positive effects and minimize sales benefits and brand attitudes, again presenting the personalization paradox, discussed by Aguirre et al. (2015, p. 35). With that said, it is therefore crucial for marketers to find the perfect sweet spot "that maximizes the noticeability and user's comfort level with personalization" (De Keyzer et al., 2022, p.139).

2.2 Privacy Concerns

As marketers continue to use personalized advertisements, individuals are becoming increasingly aware and concerned about the collection of their personal information and the surveillance of their online activities (Zuboff, 2019, p. 4; Malhieros, 2012, pp. 579-80). As a result, people's online privacy has become a significant concern. The concept of privacy, in general, is a widely researched phenomenon,

presented as a "psychological construct and a sociological issue" as well as a fundamental human right (Dinev & Hart, 2005, p. 8). Early studies surrounding the psychological construct of privacy have deemed it as "the right to be let alone" (Warren & Brandeis, 1890, p. 193). However, privacy is multidimensional, and can therefore manifest in numerous different contexts. In the early stages of privacy research, Burgoon et al. (1989, p. 132) define privacy broadly as "the ability to control and limit physical, interactional, psychological, and informational access to the self or one's group." In contemporary society, with technological advancements brought about by the Internet and social media, and the widespread collection of personal data, personal information privacy is one of the most commonly defined and researched concepts within the field of privacy, and will be the focus of this paper (Stuart et al., 2019, p. 2). Especially as a fundamental characteristic of the Internet is that "users leave permanent traces," maintaining a private life online can be next to impossible (Zahirovic et al., 2024, p. 48). In this sense, privacy concerns play a key role in online social media environments, as people fear the collection and misuse of their personal information (Jung, 2017, p. 304).

Just as seen in the conceptualization of privacy, privacy concerns are also multidimensional. Smith et al. (1996, p. 169) refer to several key elements of individuals' concerns about organizational information privacy practices, including the "collection of personal information, internal unauthorized secondary use of personal information, external unauthorized use of secondary information, errors in personal information, and improper access to personal information." As Smith (1996, p. 169) provides a general assessment of privacy concerns, other scholars have narrowed their definition to more recent technological developments and social phenomena, such as Dinev and Hart (2005, p. 9), who apply privacy concerns to the age of the Internet, where users' activities are being monitored and information is being collected without their knowledge, or sometimes, without their consent. Privacy concerns are therefore particularly evident in online environments as they mainly involve outside parties gaining access to personal information (Jung, 2017, p. 305).

These concerns can be made especially clear through the use of personalized advertisements. As highlighted by scholars Goldfarb and Tucker (2017, p. 400), highly personalized ads, particularly those that are both obtrusive and context-based, fail to work when combined due to privacy concerns among viewers. This finding is corroborated by research conducted by Jung (2017, p. 307), which again confirms that when people are exposed to highly personalized ads on social media, they become aware that marketers are tracking their information for marketing purposes, thereby increasing their privacy concerns. Scholars Boerman et al. (2017, p. 367) also express these heightened privacy concerns regarding highly personalized ads as they "lead people to perceive a loss of choice, control, or ownership and thus cause negative feelings and responses. Here, as control remains a key aspect of privacy, these

types of personalized ads can generate privacy concerns. With that said, we therefore hypothesize the following:

H1*: Higher levels of personalization increase privacy concerns compared to a) a moderately personalized ad and b) a non-personalized ad.*

2.3 The Mediating Effect of Perceived Creepiness

Alongside such privacy concerns, the personalization of advertisements has the ability to elicit more negative emotions, such as perceived creepiness, intrusiveness, and invasiveness (De Keyzer et al., 2024, p. 1209). Perceived creepiness, in this context, plays a key role in the ineffectiveness of such advertisements as it "stands out as an important emotional response, mixing fear, anxiety and strangeness" (Zhang & Xu, 2016, p. 1676). Especially through perceived surveillance, often present throughout personalized ads, perceived creepiness is able to evoke active discomfort among online users (Sherber et al., 2024, p. 8).

In general, creepiness is defined by McAndrew and Koehnke (2016, p. 10) as the "anxiety aroused by the ambiguity of whether there is something to fear or not, and/or advertisements ambiguity of the precise nature of the threat that might be present." In other words, perceived creepiness highlights an individual's concern regarding a potential threat. Outside of psychology, this term is also frequently found in advertising and communication studies to help better understand consumers (De Keyzer et al., 2022, p. 140; Sherber et al., 2024, p. 8; Malheiros et al., 2012, p. 581).

As mentioned, perceived creepiness is especially relevant when applied to personalized advertising. Studies highlight that, although the initial goal of personalized advertising is to incorporate personal aspects to generate more attention, over-personalized ads can also cause users to become 'creeped out' (De Keyzer, 2022, p. 149). Especially since users may not always be aware of how their data is collected or used, the use of personal information in ads can be confronting and thus evoke such perceived creepiness (De Keyzer et al., 2022, p. 149). Here, White et al.'s (2008, p. 41) theory of personalization reaction is critical. This term originates from the concept of psychological reactance, which, as highlighted by Brehm (1996), presents the state that arises in a person whose freedom is perceived to be threatened (White et al., 2008, p. 41). This state thus causes the affected individual to do the opposite of what they were told as a means to regain their independence, their freedom, and their agency (White et al., 2008, p. 41). Similarly, White et al. (2008, p. 41) refer to personalization reactance as the response that appears when users sense that they are being closely monitored online by personalized messages, often provoking negative feelings among individuals, such as perceived creepiness. These emotions resulting from personalization have been shown to cause users to resist such ads by doing the opposite of what is shown (White et al., 2008, p. 41; De Keyzer et al., 2022, p. 141).

This, therefore, presents the idea that as the level of personalization rises, so does a user's perceived creepiness (De Keyzer et al., 2022, p. 149). Additionally, as perceived creepiness in personalized advertisements stems from the "sense that someone has been snooping into a part of your life that should remain private", this feeling directly violates the privacy norms as mentioned above (Malhierios et al., 2017, p. 581). As a result, we therefore assume the following:

H2*: Higher levels of personalization increase perceived creepiness compared to a non-personalized ad.*

H3*: Perceived creepiness increases privacy concerns in response to personalized Instagram ads.*

H4*: Perceived creepiness mediates the relationship between ad personalization and privacy concerns, such that higher levels of personalization increase perceived creepiness, which, in turn, increases privacy concerns.*

2.4 The Mediating Effect of Perceived Relevance

As discussed, privacy concerns do pose a risk to the effectiveness of personalized ads. However, other studies have shown that certain factors seem to positively affect users' privacy concerns when confronted with personalized ads. These include increased convenience, increased attraction as well as certain economic benefits such as discounts (Jung, 2017, p. 304; Segijn & Van Ooijen, 2020, p. 218; Boerman et al., 2021, p. 1). Most notable among the positive effects of personalization is perceived relevance. Several studies have presented this concept as a key factor in the benefits of online personalization (De Keyzer et al., 2022, p. 141; Jung, 2017, p. 304; Kim & Huh, 2017, pp. 95-96). This concept refers to the degree to which an individual believes that a piece of information, product, or experience is personally meaningful, helpful, or self-related to their needs, interests, or goals (Kim & Huh, 2017, p. 95; Jung, 2017, p. 305). This concept draws on the theory of self-referencing, as highlighted by De Keyzer et al. (2015, p. 126), which refers to the extent to which consumers relate information to themselves. Here, in the context of personalized messages, consumers tend to perceive such ads as more self-relevant because they use information about them, thereby prompting their perceived relevance (De Keyzer et al., 2015, p. 126).

In general, perceived relevance has been studied within multiple contexts within the advertising field, playing a key role in developing a positive impact on the effectiveness of advertising "in cognitive, affective, and behavioral areas" (Jung, 2017, p. 304). For example, as studied by Kim and Huh (2017, p. 101), the perceived relevance of an advertisement has the ability to attract more "attention to the ad, more positively evaluate the ad, and click on the ad." Similarly, when an ad accurately fits a consumer's online behavior and beliefs, it can also increase an individual's intention to purchase the advertised products

(Summers et al., 2016, p. 164). Furthermore, Jung (2017, pp. 308-309) confirmed that perceived ad relevance influences advertising effectiveness, such as increased attention to ads and decreased ad avoidance. Overall, the concept of perceived relevance remains essential in maximizing advertising outcomes. Its influence across attention, ad engagement, and purchasing behavior highlights its crucial role in shaping effective marketing strategies. Perceived relevance is especially essential in the context of social media. As studied by Kelly, Kerr, and Drennan (2010, p.23), advertising avoidance on social networking sites (SNSs) is most commonly caused by a lack of perceived relevance. Here, social contract theory plays a key role as it highlights the bon of trust between the user and the platform that the data being shared with as users, in return, are presented relevant, and desired advertisements.

It can, therefore, be determined that in order for persuasion to occur in response to personalized ads, the ad must be personally relevant to the viewer (De Keyzer et al., 2015, p. 126; Boerman et al., 2021, p. 2). By being relevant, personalized ads are able to distract users from the fact that their personal data is being used and, in turn, bring focus to the product or service specifically catered to them, as it has strong persuasion effects (Jung, 2017, p. 307).

This paper, therefore, hypothesizes the following:

H5*: Higher levels of personalization increase perceived relevance compared to a non-personalized ad.*

H6*: Perceived relevance decreases privacy concerns in response to personalized Instagram ads.*

H7*: Perceived relevance mediates the relationship between ad personalization and privacy concerns, such that higher levels of personalization increase perceived relevance, which in turn, reduces privacy concerns.*

2.5 Data Sharing

In today's age, data-sharing behaviors are what make social media work the way it does in terms of personal algorithmic feeds and personal advertising. Throughout research, the concept of data-sharing is more commonly referred to as self-disclosure. This concept, also commonly referred to as information revelations, is frequently used within psychology research as it studies what "people reveal about themselves, in what contexts, or how disclosure is done" (Stuart, 2019, p. 2; Gross and Acquisti, 2005, p. 2). Here, it can be split into three distinct patterns (Gross and Acquisti, 2005, p. 2). Firstly, a notable pattern is highlighted in the fact that social networking sites encourage their users to use their real names to represent their account profiles, as well as include personal and identifiable photos (Gross & Acquisti, 2005, p. 2). Another recognized pattern of information revelation is the sharing of hobbies or interests, as

well as semi-public information such as previous schools or employers, or private information such as drinking habits or sexual orientation (Gross & Acquisti, 2005, p. 2).

Since Gross and Acquisti's work, social networking sites have evolved dramatically, both in terms of scale and complexity. More recent scholars have expanded upon their approach by examining not only the data users voluntarily disclose but also the extensive amounts of data passively collected through user actions, such as likes, shares, comments, browsing patterns, and location checks (Zhu & Bao, 2018, p.169; Paramarta et al., 2018, p. 275). The effect of this tracking can significantly impact users' privacy concerns, as studied by Paramarta et al. (2018, p. 275), as consumers' attitudes toward privacy significantly influence their data-sharing behaviors.

Here, the privacy calculus theory, as coined by Culnan and Armstrong (1999), becomes particularly relevant as it provides a framework for understanding why users continue to engage with platforms that extensively track and utilize their data. Defined by Zahirovic et al. (2024, p. 48), adapting the privacy calculus theory from its original scholars (Culnan and Armstrong,1999), this theory highlights the "relationship between the expected benefit and the perceived risk in terms of consumer privacy," suggesting that individuals engage in the form of cost-benefit analysis when deciding whether or not to disclose personal information. Such individuals, especially on social media, are thereby constantly confronted with this tradeoff. Either they choose to protect their privacy and limit data sharing when the perceived risks, including identity theft, surveillance, or unwanted exposure (Bol et al., 2018, p. 372; Gross & Acquisti, 2005, p. 2) outweigh the anticipated rewards, or they choose to give up a degree of their privacy if the benefits, such as personalized recommendations, entertainment, or social connectivity, appear more valuable (De Keyzer et al., 2022, p. 139; Bol et al., 2018, p. 372). This, therefore, highlights the complexity of personalized ads. While some users may willingly share data in exchange for tailored content, others with heightened privacy concerns tend to be more cautious in self-disclosure or resist it entirely (Boerman et al., 2021, p. 3; Paramarta et al., 2018, p. 275; Baruh et al., 2017, p. 27). Building on the findings from these studies, we therefore hypothesize that:

H8*: Increased privacy concerns in response to personalized Instagram ads will increase users' reluctance in data-sharing behaviour.*

2.6 Conceptual Framework

The literature and hypotheses presented above collectively form a conceptual framework, as illustrated in Figure 1.

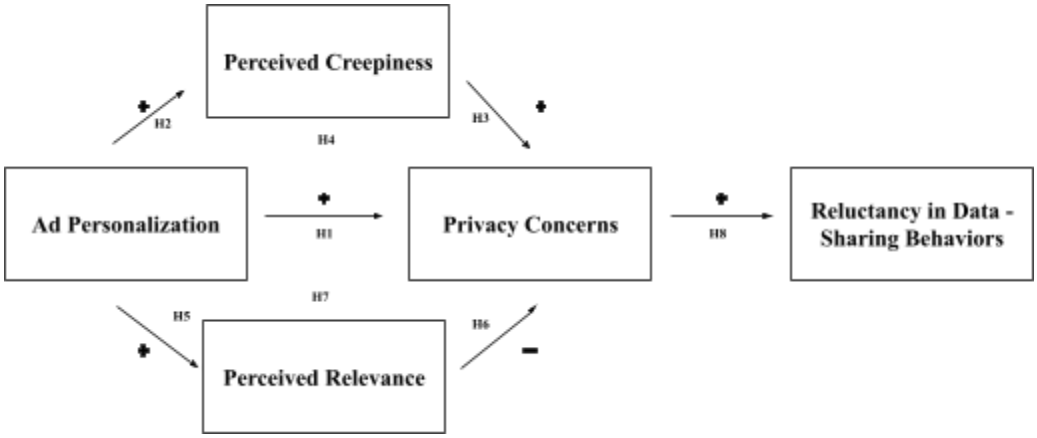

Figure 1. Conceptual Model of Concepts and Hypotheses

3. Method

3.1 Design

To answer the aforementioned research questions and test the hypotheses, this study employed a quantitative methodology. This method, as discussed by Babbie (2017, p. 423), highlights the "techniques by which researchers convert data to a numerical form and subject it to statistical analysis." In other words, quantitative methods enable the measurement of relationships between variables and provide statistical evidence for their effects, both of which are critical in supporting this analysis, as its objective is to measure and compare the levels of personalization with privacy concerns and data sharing, as well as perceived creepiness and relevance.

To achieve this, this research employs an experimental survey methodology. Here, the survey provides a broad, quantitative overview of participants' feelings towards personalization, privacy, and data sharing and offers a space for the experiment to take place online (Vargas et al., 2017, p. 101). The experiment, on the other hand, provides a somewhat controlled environment through fictitious advertisments to help establish the cause-and-effect relationships between the variables, "eliminating any external conditions that could confound or confuse these results" (Vargas et al., 2017, p. 101). Overall, the combination of these methods is crucial to this research, as it enables a more in-depth understanding of online user and consumer behavior regarding the growing phenomenon of ad personalization.

More specifically, the design of the experiment follows a three-level between-subjects experimental survey design. This experiment is, therefore, designed so that participants are assigned to only one of the conditions. Here, comparisons will be made between the three groups that received the different conditions (Vargas et al., 2017, p. 110). The reasoning behind using this experimental design in this specific study is important for several reasons. First of all, it ensures the authenticity of the participants' responses. Especially as they are being questioned about their feelings towards a specific level of personalization within an ad, it is crucial that the participants are exposed to only one advertisement to not confuse it with the others. Additionally, this prevents them from realizing that this study revolves around ad personalization and privacy concerns, and data sharing, as well as prevents them from formulating their own, incorrect interpretations. A within-subjects design would potentially give participants enough information to change their answers based on how they would want to be perceived or how they think the researcher would want them to respond if they were to see the other two conditions (Vargas et al., 2017, p.110). Additionally, as this survey was already quite long, a between-subjects design ensures that participants put their full attention on the singular ad and scenario they received.

Within this experiment, the three conditions were represented by three levels of personalization. Here, personalization is operationalized according to De Keyzer et al. (2022, p. 16), who identified the

three most important determinants of perceived personalization: interests, location, and age, in this order of importance. These three key elements of personalization are utilized in the creation of the three levels of personalization, which include highly personalized ads, moderately personalized ads, and non-personalized ads. Here, the highly personalized ad was characterized using all three key elements of perceived personalization (interests, age, and location). The moderately personalized ad was limited to only using one's location in the advertisement as it is the middle level of the perceived personalization factors, thus allowing the ad to still 'moderately' be perceived as personalized, but much less than the 'high' condition. (De Keyzer et al., 2022, p. 16). The last group of participants represents the control group, who were shown a non-personalized ad. This condition did not include any additional personalized elements but only highlights the ad itself, allowing the other two groups to be accurately measured and compared.

The three conditions were presented to survey participants in the form of a personalized scenario and a fictitious personalized ad. The ads were created first using Berlo et al.'s (2024, p. 736) MADE framework for effective generative AI-based stimulus development. This framework presents four phases – Mapping, Assembling, Demonstrating, and Executing (Berlo et al., 2024, p. 736). In the first phase, researchers are instructed to determine the manipulation and context of the condition. In this study, the manipulation involves personalizing advertisements, and the context is social media, specifically Instagram. The next step, according to Berlo et al. (2024, p. 737), was assembling. This was accomplished by selecting an AI tool, and after some trial and error with multiple AI sites, including DreamStudio.ai, Artbreeder, and ChatGPT, researchers ultimately chose ChatGPT as the results provided were most realistic to an authentic Instagram advertisement that users would actually see on their feeds. Additionally, ChatGPT also understood the prompts more effectively, thereby more easily facilitating the researcher's goals. The second step of the assembling phase was to formulate a prompt (Berlo et al., 2024, p. 737). The idea behind developing these Instagram ads was to create an advertisement that anyone could somewhat recognize from their own personal Instagram feeds. As the fashion industry is one of the biggest users of social media in their marketing, it was decided to focus the advertisement on a fictional clothing brand (San Miguel et al., 2024, p. 9). Here, researchers found it best to use a fictitious brand rather than a pre-existing one because participants may already have pre-existing perceptions of the brand, which could hinder the study's effects. In contrast, the fictitious brand presents them with something new and untainted (Geunes & Pelsmacker, 2017, pp. 85-86). Here, the three determinants of personalization were made more specific, with sustainability as the interest, Gen Z as the targeted age group, and the Netherlands as the location, as Berlo et al. (2024, p. 737) recommend that the more detailed the information, the higher the quality of AI content. This specific information was also chosen because it is

something that almost everyone can already relate to and, therefore, provides a somewhat realistic personalized effect on users.

The third step in assembling the AI input is to evaluate its output (Berlo et al., 2024, p. 738). This process had to be repeated multiple times to create these Instagram advertisements, as the instructions were repeated and added to for more detail until researchers were ultimately satisfied with the results (Appendix D). Berlo et al. (2024, p. 737) also recommended editing this output manually; however, it was not deemed necessary for the final result. The third phase of Berlo et al.'s (2024, p. 738) framework emphasizes the concept of demonstration. This, as they highlight, is achieved through a pretest to determine whether the AI-generated stimuli accurately represent their intended purpose, in this case, the different levels of personalization (Berlo et al., 2024, p. 737). Lastly, the final phase of the MADE framework is execution, which was done as presented in the final survey.

The final three personalized ads used in the survey presented a sustainable brand called 'NORDWRLD,' which was also fabricated by ChatGPT. The ad portrayed the brand's store opening. Here, the highly personalized ad showcased elements of sustainability, Gen Z, and that the new store was based in the Netherlands. The captions of the fictitious Instagram post also included the same personalized aspects, highlighting sustainable clothing made for Gen Z and based in the Netherlands for the store's new opening. The moderately personalized ad was almost identical to the highly personalized ad; however, it only showed that the new storefront was opening in the Netherlands. The caption of this Instagram post was shorter, only encouraging people to 'come visit' the new NL-based store. Lastly, the non-personalized ad was visually similar to the other two personalized ads; however, it did not provide any elements of personalization. Additionally, the caption on the ad led viewers to believe that the store was opening without mentioning the interests, location, or targeting an age group. (Appendix A)

In addition to the AI-generated advertisements following the framework created by Berlo et al. (2024, p. 736), the visual stimuli were also accompanied by scenarios that gave participants a type of persona that corroborated the personalized ads. Here, the ad with the highest level of personalization received the following text: "Imagine (living in / visiting) the Netherlands, with a strong interest in sustainable fashion. You follow sustainable clothing brands on social media, and you prioritize buying items that are both stylish and eco-friendly. You're taking a break from your day, casually browsing through photos, stories, and updates on Instagram. As you continue through your feed, you come across this advertisement." Those who received the moderately personalized ad received this scenario: "Imagine (living in/ visiting) the Netherlands. You're taking a break from your day, casually browsing through photos, stories, and updates on Instagram. As you continue through your feed, you come across this advertisement." For both the highly and moderately perceived ads, the option of 'living in' or 'visiting' the Netherlands changed based on their location, again to present a certain level of real personalization.

Lastly, those who received a non-personalized ad were presented with this scenario: “Imagine you are scrolling through your Instagram feed. You’re taking a break from your day, casually browsing through photos, stories, and updates. As you continue through your feed, you come across this advertisement.”

Overall, this design thereby helps in examining the impact of each level of personalization, allowing for more precise conclusions regarding their influence on privacy concerns and data-sharing behavior, as well as a more comprehensive analysis of how perceived emotions can influence this relationship.

3.2 Pretest

As recommended by Berlo et al.(2024, p. 738), before the final survey could be sent out, a pretest was administered (Appendix H). This pretest collected a sample of 34 participants from Gen Z who were recruited on Instagram through a temporary story. Once the desired number of participants was recruited, the story was deleted, and the survey ended. Within this sample, 29.4% were male, 67.6% were female, and 2.9% were non-binary or third gender. Here, the majority of participants either had a Bachelor’s degree (64.7%) or a Master’s degree (20.6%).

The primary goal of this study was to determine whether the stimulus materials effectively demonstrated their intended purpose. This pretest survey, therefore, demonstrated a within-subjects design where each participant was shown all three fictitious advertisements and scenarios. The order in which they viewed these advertisements was randomized in order to minimize any learned effects and maintain reliability. After each scenario and advertisement, participants were then asked to complete De Keyzer et al.’s (2022, p.10) Perceived Personalization scale in order to fully determine how the different levels of personalization were shown in each ad. This was assessed using a 7-point Likert scale, where 1 indicated ‘Strongly Agree’ and 7 indicated ‘Strongly Disagree’. Participants rated the following statements based on the question, “Based on the presented Instagram ad and scenario, to what extent do you agree with the following statements?” “1) This ad is tailored to my situation, 2) I believe this ad is customized to my needs, 3) This ad was targeted at me as a unique individual, 4) I believe that this ad is customized to my characteristics, 5) This ad was personalized according to my profile, 6) There was personal information in the ad, 7) The ad was targeted at me, 8) I could recognize myself in the group the ad was targeted at.”

To test whether this sample correctly detected levels of personalization, descriptive statistics were run for each condition and its perceived personalization results. Here, the highly personalized ad, with all three determinants of personalization, had a perceived personalization average of 3.90 (SD = .998), and the moderately personalized ad, with only location as the personalized element, had an average of 3.02 (SD = .905). Lastly, the non-personalized ad presented an average of 2.1 (SD = 1.10). Here, the averages

of each condition accurately reflected the perceived level of personalization by participants, which allowed these stimuli to be used in the final data collection survey.

3.3 Sample

To collect a sample for the main study, both convenience sampling and snowball sampling methods were employed. As explained by Stockemer (2018, p. 62), convenience sampling highlights "a type of non-probabilistic sampling technique where people are selected because they are readily available." Snowball sampling, on the other hand, involves gradually assembling a sample by relying on individuals to refer to others, thereby slowly expanding the respondent pool through social networks (Stockemer, 2018, p. 63). Following both methods, the sample was recruited through the researcher's personal Instagram account, as presented in convenience sampling, and the personal accounts of their friends, as demonstrated by snowball sampling. Here, the survey was turned into a link and posted on Instagram as a story. Once viewed by users, they could then click on the link, which directed them directly to the survey. The survey was posted twice on Instagram, one week apart from each other. A total of 12 friends from different countries reposted this link to their Instagram accounts twice, a week apart. Both snowball and convenience sampling fall within the lines of non-probability sampling and can therefore present potential biases and limited representation of the population (Babbie, 2017, pp. 199-200). However, the combination of these sampling methods is most suitable for this research as it can ensure that specific criteria needed from participants are already met, facilitates the process of finding participants willing to participate, and provides a large sample (Babbie, 2017, pp. 196-197). Notably, as this study's primary focus is on personalized ads on Instagram, recruiting participants through the same platform ensures their relevance, as they have first-hand experience with the platform and its personalized ads. Additionally, this recruitment method also makes it easier to collect data from participants who fall into the age range of this study, as the majority of the researchers' followers on Instagram are close in age (Gen Z), it guarantees their ability to participate.

Prior to analysis, the data set was inspected for errors, missing values, outliers, and any necessary clarifications. A total of 67 participants were excluded from this study due to incomplete responses, as well as those who indicated that they were not part of Gen Z, as they were directed to the end of the survey. The cleaned dataset, therefore, contained a total of 150 participants, wherein 49.3% were male, 48.0% were female, 2.0% were non-binary/third gender, and 0.7% preferred not to say. Since the survey required participants to be part of Gen Z, the ages of these participants only ranged from 17-28 (M=23.57, SD=1.90). Additionally, participants were asked to indicate the highest level of education they had completed. Here, 0.7% of participants had completed less than a high school degree, 2% received a high school degree (or equivalent such as GED), 11.3% went to college but did not get a degree, 62.0%

received a Bachelor's degree, 23.3% received a Master's degree, and 0.7% received a professional degree (JD, MD). Furthermore, the sample contained individuals from 14 different countries. The majority of participants were from the Netherlands, accounting for 47.3% of the sample. This is followed by the United States with 26.7%, the United Kingdom with 8.7%, and Poland with 7.3%. Participants were also asked to indicate their political viewpoints on a scale from 1 (very conservative) to 5 (very liberal). Here, 0% of the sample cited that they were very conservative, 2.0% of the sample indicated that they were 2nd on the scale, 24.7% claimed they were 3rd, 53.3% noted they were 4th, and 20% indicated that they were 'very liberal' (5th on the scale). Participants were also asked about the frequency with which they use Instagram. 88.7% of participants indicated that they use Instagram multiple times a day, 8.7% use the platform only once a day, 2.0% use it a few times a week, and 0.7% use it only once a week. Furthermore, participants indicated how often they see personalized ads on Instagram. This resulted in 20.0% claiming only to see them 'sometimes,' 30.0% seeing personalized ads about 'half of the time,' 44.0% answering 'most of the time,' and 6.0% claiming they 'always' see personalized ads. Overall, it took an average of eight and a half minutes (M = 509.73, SD = 1113.6) for participants to complete the survey, with a minimum of 78 seconds and a maximum of three and a half hours. Despite the significant difference between the two ends, both participants remained in the study. First of all, as the participant who took 78 seconds was shown a non-personalized ad, where most of the questions did not seem relevant, this could have contributed to their fast response time. Moreover, despite three hours being quite long, their participation is necessary to achieve a large enough sample size. As this is an online survey, there is no controlled time limit, and therefore, it allows people to exit the survey and return after some time.

3.4 Operationalization

Overall, this study examines several key aspects of personalized ads on Instagram, including privacy concerns, reluctance to share data, as well as perceived creepiness and relevance. Here, it is crucial to clearly operationalize each of these concepts to ensure accurate and valid results as well as facilitate future replications of the study.

3.4.1 Privacy Concerns

Privacy concerns were measured using an adapted Perceived Privacy Concern Scale as used by Kim et al. (2022, p.7), which measures individuals' privacy concerns after viewing a personalized (or non-personalized) advertisement. Here, participants responded to the statements, "After viewing this advertisement, I am concerned…" "1) that Instagram is collecting too much personal information from me, 2) about the privacy of my personal information, 3) about what others might do with my personal information, 4) that my personal information could be used in a way I did not foresee". These responses were recorded on a Likert scale ranging from 1 = Strongly Disagree to 7 = Strongly Agree.

Firstly, to explore the underlying dimensions of the four Privacy Concerns items, a Principal Component Analysis (PCA) was conducted using direct oblimin rotation based on eigenvalues (> 1.00). The Kaiser-Meyer-Olkin value of .79 verified the sampling adequacy for the analysis, as this exceeds the acceptable minimum value of .60 (Kaiser, 1970). Bartlett's Test of Sphericity was significant, $\chi^2(6)= 599.27$, $p < .001$, thereby indicating that the correlations between items were sufficiently large for PCA (Bartlett, 1954). The resultant model consists of one factor, which together explained 84.8% of the variance in Privacy Concerns features. Additionally, the reliability of this scale was high, with the Cronbach's alpha reliability coefficient being .94. The factor loadings and the Cronbach's alphas of each factor are presented in Table 1.

Table 3.1

Factor Analysis on Privacy Concerns

Factor loadings, explained variance, and reliability of the X factors found for the scale of Privacy Concerns

Item	***Privacy Concern***
That Instagram is collecting too much personal information from me.	.95
About the privacy of my personal information.	.93
About what others might do with my personal information.	.92
That my personal information could be used in a way I did not foresee.	.88
R²	.85
***Cronbach's* α**	.94

3.4.2 Reluctance in Data-Sharing

Lastly, to measure the participants' data-sharing behaviors, this survey asked participants the levels at which they are willing to share their personal information. Using an adapted version of the Willingness to Disclose Personal Information Scale (WDI) presented by Martins et al. (2024, p. 40), the survey inquires about participants' data-sharing behaviors through Instagram, where 1 = Strongly Disagree and 7 = Strongly Agree. The statements within this adapted Likert scale include: "After viewing this advertisement, 1) I will think twice before providing my personal information to Instagram

advertisers, 2) It will bother me to share my personal information with multiple brands on Instagram, 3) I will care whether Instagram collects too much personal information about me".

Here, to explore the underlying dimensions of the three Disclosure items, a Principal Component Analysis (PCA) was conducted using direct oblimin rotation based on eigenvalues (> 1.00). The Kaiser-Meyer-Olkin value of .73 verified the sampling adequacy for the analysis, as this exceeds the acceptable minimum value of .60 (Kaiser, 1970). Bartlett's Test of Sphericity was significant, $\chi^2(3)= 279.75$, $p < .001$, thereby indicating that the correlations between items were sufficiently large for PCA (Bartlett, 1954). The resultant model consists of one factor, which together explained 82.7% of the variance in Disclosure features. A reliability test was conducted on the three items within this scale in order to confirm the overall dependability of the scale. This result demonstrated a high-reliability rating as the Cronbach's alpha reliability coefficient was .90. The factor loadings and the Cronbach's alphas of each factor are presented in Table 2.

Table 3.2

Factor Analysis on Disclosure of Personal Information

Factor loadings, explained variance, and reliability of the X factors found for the scale of Disclosure of Personal Information

Item	***Disclosure***
I will think twice before providing my personal information to Instagram advertisers.	.87
It will bother me to share my personal information with multiple brands on Instagram	.93
I will care whether Instagram collects too much personal information about me	.92
R²	.83
***Cronbach's* α**	.90

3.4.3 Perceived Creepiness

To address the emotional responses of Gen Z Instagram users, this study made use of scales presented by De Keyzer et al. (2022, p.144), highlighting both positive and negative emotional responses. Here, negative emotions were addressed through De Keyzer et al.'s (2022, p.144) Perceived Creepiness

Scale, asking participants "To what extent do you think the advertisement was 1) creepy, 2) disturbing, 3) worrying" on a seven-point Likert scale wherein 1= Strongly disagree and 7= Strongly agree.

To explore the underlying dimensions of the three Perceived Creepiness items, a Principal Component Analysis (PCA) was conducted using direct oblimin rotation based on eigenvalues (> 1.00). The Kaiser-Meyer-Olkin value of .71 verified the sampling adequacy for the analysis, as this exceeds the acceptable minimum value of .60 (Kaiser, 1970). Bartlett's Test of Sphericity was significant, $\chi^2(3)= 290.70$, $p < .001$, thereby indicating that the correlations between items were sufficiently large for PCA (Bartlett, 1954). The resultant model consists of one factor, which together explained 83.2% of the variance in the Creepiness features. A reliability test was conducted on the three items within this scale in order to confirm the overall dependability of the scale, resulting in high ratings on the reliability score, as the Cronbach's alpha reliability coefficient was .89. The factor loadings and the Cronbach's alphas of each factor are presented in Table 3.

Table 3.3

Factor Analysis on Perceived Creepiness

Factor loadings, explained variance, and reliability of the X factors found for the scale of Disclosure of Perceived Creepiness

Item	***Disclosure***
Creepy	.89
Disturbing	.90
Worrying	.95
R^2	.83
***Cronbach's* α**	.89

3.4.4 Perceived Relevance

Positive emotions were also presented by adapting Keyzer et al.'s (2022, p. 144) "Perceived Relevance Scale," asking, "To what extent did you find this advertisement 1) important, 2) relevant, 3) meaningful on a seven-point Likert scale wherein 1= Strongly disagree and 7= Strongly agree. The original scale in De Keyzer et al.'s research used a seven-point semantic differential; however, a Likert scale in this context aids in making the overall questionnaire more comprehensible for participants and helps facilitate the analysis.

To explore the underlying dimensions of the three Perceived Creepiness items, a Principal Component Analysis (PCA) was conducted using direct oblimin rotation based on eigenvalues (> 1.00).

The Kaiser-Meyer-Olkin value of .73 verified the sampling adequacy for the analysis, as this exceeds the acceptable minimum value of .60 (Kaiser, 1970). Bartlett's Test of Sphericity was significant, $\chi^2(3)= 285.72$, $p < .001$, thereby indicating that the correlations between items were sufficiently large for PCA (Bartlett, 1954). The resultant model consists of one factor, which together explained 83.9% of the variance in Disclosure features. A reliability test was conducted on the three items within this scale in order to confirm the overall dependability of the scale. To ensure the dependability of this scale, a reliability analysis was conducted, resulting in high ratings on the reliability score, as the Cronbach's alpha reliability coefficient was .90. The factor loadings and the Cronbach's alphas of each factor are presented in Table 4.

Table 3.4

Factor Analysis on Perceived Relevance

Factor loadings, explained variance, and reliability of the X factors found for the scale of Perceived Relevance

Item	***Disclosure***
Important	.92
Relevant	.93
Meaningful	.90
R²	.84
***Cronbach's* α**	.90

3.4.5 Manipulation Check

A manipulation check is essential when conducting an experiment and survey, as it is able to validate the internal validity of the study. Here, it was important that the participants understand the visual stimuli, and therefore, they were asked about the perceived personalization of the presented ad. This was accomplished using De Keyzer et al.'s (2022, p. 10) Perceived Personalization Scale. On a 7-point Likert scale (1= Strongly Disagree and 7= Strongly Agree), participants rated the following statements based on the question, "Based on the presented Instagram ad and persona, to what extent do you agree with the following statements?" "1) This ad is tailored to my situation, 2) I believe this ad is customized to my needs, 3) This ad was targeted at me as a unique individual, 4) I believe that this ad is customized to my characteristics, 5) This ad was personalized according to my profile, 6) There was personal information in the ad, 7) The ad was targeted at me, 8) I could recognize myself in the group the ad was targeted at."

Here, in order to confirm the manipulation check, a Principal Component Analysis (PCA) was conducted to explore the underlying dimensions of the eight Perceived Personalization items, using direct oblimin rotation based on eigenvalues (> 1.00). The Kaiser-Meyer-Olkin value of .73 verified the sampling adequacy for the analysis, as this exceeds the acceptable minimum value of .60 (Kaiser, 1970). Bartlett's Test of Sphericity was significant, $\chi^2(28)= 1256.74$, $p < .001$, thereby indicating that the correlations between items were sufficiently large for PCA (Bartlett, 1954). The resultant model consists of one factor, which together explained 79.34% of the variance in Perceived Personalization features. A reliability test was conducted on the eight items within this scale in order to confirm the overall dependability of the scale, resulting in high ratings on the reliability score, as the Cronbach's alpha reliability coefficient was .96. The factor loadings and the Cronbach's alphas of each factor are presented in Table 5.

Table 3.5

Factor Analysis on Perceived Personalization

Factor loadings, explained variance, and reliability of the X factors found for the scale of Perceived Personalization

Item	***Perceived Personalization***
This ad was targeted at me as a unique individual.	.92
I believe that this ad is customized to my characteristics.	.92
This ad is tailored to my situation.	.90
I believe this ad is customized to my needs.	.90
This ad was personalized according to my profile.	.90
I could recognize myself in the group the ad was targeted at.	.90
The ad was targeted at me.	.87
There was personal information in the ad.	.82
R²	.79
***Cronbach's* α**	.96

3.4.6 Potential Confounds

In addition to these key scales, it is also essential to test for any potential confounding variables. As defined by Neuman (2011, p. 283), confounding variables in experimental research are factors that are

not part of the intended hypothesis being tested, but that have effects on variables of interest and threaten internal validity." These confounding variables include the frequency with which participants use Instagram as a platform in general, as well as how often these users see personalized advertisements on their Instagram feeds.

Additionally, participants were asked about their general online privacy awareness using Buchanan et al.'s (2007, p. 161) Technical Protection scale. They were asked the following six questions on a five-point Likert scale ranging from (1) never - (5) always: "Do you watch for ways to control what people send you online (such as check boxes that allow you to opt-in or opt-out of certain offers)?", "Do you remove cookies?", "Do you use a pop-up window blocker?", "Do you check your computer for spyware?", "Do you clear your browser history regularly?", "Do you block messages/emails from someone you do not want to hear from?".

To explore the underlying dimensions of the six General Technical Privacy Concerns items, a Principal Component Analysis (PCA) was conducted using direct oblimin rotation based on eigenvalues (> 1.00). The Kaiser-Meyer-Olkin value of .62 verified the sampling adequacy for the analysis, as this exceeds the acceptable minimum value of .60 (Kaiser, 1970). Bartlett's Test of Sphericity was significant, $\chi^2(15)= 208.72$, $p < .001$, thereby indicating that the correlations between items were sufficiently large for PCA (Bartlett, 1954). The resultant model consisted of two factors, which together explained 60.1% of the variance in the General Technical Privacy Concerns. The first factor included four items about online privacy management, which explained 41.9% of the variance. The second factor, regarding civil environmental actions, included 2 items, explaining 18.1% of the variance. Here, a reliability test was conducted on the two factors in order to confirm their overall dependability. For the first factor, the Cronbach's alpha was .73; however, after the removal of one of the items, specifically the one regarding spyware, the Cronbach's alpha rose to .75. This item was therefore deleted to secure the reliability of the scale. Additionally, the reliability check regarding the second factor had a very low Cronbach's alpha of .34 and was therefore not applied to the analysis to secure the overall integrity and accuracy of the study. The factor loadings and the Cronbach's alphas of each factor are presented in Table 4.

Table 3.6

Factor Analysis on General Privacy Concerns

Factor loadings, explained variance, and reliability of the X factors found for the scale of Sustainability

Item	*Online Privacy Management*	*Civil Environmental Actions*
Do you watch for ways to control what people send you online (such as check boxes that allow you to opt-in or opt-out of certain offers)?	.90	
Do you remove cookies?	.82	
Do you use a pop-up window blocker?	.70	
Do you check your computer for spyware?	(.46)	(.34)
Do you block messages/emails from someone you do not want to hear from?	(.43)	.40
Do you clear your browser history regularly?		.92
R²	.42	.18
***Cronbach's* α**	.75	.34

Another potential confounding variable that was added to the survey was social media brand trust. Using Zhang et al.'s (2022, p.5) adapted scale from Chaudhuri and Holbrook's (2001) brand trust scale, this study measured trust in Instagram with three items using a seven-point Likert scale (1= Strongly Disagree, 7 = Strongly Agree). Here, the following three statements were shown: "I trust this social media brand (Instagram)", "I have confidence in this social media brand (Instagram)", and "This social media brand never disappoints me (Instagram)".

Here, in order to confirm the manipulation check, a Principal Component Analysis (PCA) was conducted to explore the underlying dimensions of the three Instagram Trust items, using direct oblimin rotation based on eigenvalues (> 1.00). The Kaiser-Meyer-Olkin value of .66 verified the sampling adequacy for the analysis, as this exceeds the acceptable minimum value of .60 (Kaiser, 1970). Bartlett's Test of Sphericity was significant, $\chi^2(3)= 225.32$, $p < .001$, thereby indicating that the correlations between items were sufficiently large for PCA (Bartlett, 1954). The resultant model consists of one factor, which together explained 75.97% of the variance in the Instagram Trust features. A reliability test was conducted on the three items within this scale in order to confirm the overall dependability of the scale. This resulted in a high reliability rating, with a Cronbach's alpha coefficient of .83, indicating good internal consistency. However, the analysis also revealed that if the item stating "Instagram never disappoints me" were removed, the reliability would increase to .91. Therefore, this item was excluded to

enhance the overall internal consistency of the scale. The factor loadings and the Cronbach's alphas of each factor are presented in Table 4.

Table 3.7

Factor Analysis on Social Media Brand Trust

Factor loadings, explained variance, and reliability of the X factors found for the scale of Social Media Brand Trust

Item	***Social Media Brand Trust***
I trust the social media brand (Instagram).	.92
I have confidence in this social media brand (Instagram).	.92
This social media brand never disappoints me (Instagram).	(.77)
R²	.76
***Cronbach's* α**	.91

Lastly, as some participants received an ad that presented an interest in sustainability, the level of one's actual interest in sustainability was measured to address whether the presented advertisement was something participants could actually relate to. Here, the survey followed a section of Gericke et al. (2018, p. 41) scale for sustainable behavior concerning the environment, including 7 statements on a Likert scale from strongly disagree to strongly agree. These statements included: 1)"Where possible, I choose to cycle or walk when I'm going somewhere, instead of travelling by motor vehicle", 2)"I never waste water.", 3)"I recycle as much as I can", 4)"I pick up rubbish when I see it out in the countryside or in public places, 5)"I don't think about how my actions may damage the natural environment", 6)"I always separate food waste before putting out the rubbish when I have the chance", 7)"I have changed my personal lifestyle in order to reduce waste (e.g., throwing away less food or not wasting materials)". Here, the 5th statement was reverse-coded in order to maintain accurate results.

To explore the underlying dimensions of the seven Sustainability items, a Principal Component Analysis (PCA) was conducted using direct oblimin rotation based on eigenvalues (>1.00). The Kaiser-Meyer-Olkin value of .74 verified the sampling adequacy for the analysis, as this exceeds the acceptable minimum value of .60 (Kaiser, 1970). Bartlett's Test of Sphericity was significant, $\chi^2(21)= 191.17$, $p < .001$, thereby indicating that the correlations between items were sufficiently large for PCA (Bartlett, 1954). The resultant model consisted of two factors, which together explained 53.4% of the

variance in Sustainability features. The first factor included five items about sustainable lifestyle behaviors, which explained 37.5% of the variance. The second factor, regarding civil environmental actions, included 2 items, explaining 15.9% of the variance. Here, a reliability test was conducted on the two factors in order to confirm their overall dependability. The first factor was proven to be reliable with a high Cronbach's alpha of .72, whereas the second factor had a different result. Here, the other two factors had an extremely low reliability with a Cronbach's alpha of .34. This factor was therefore removed from the analysis to ensure the integrity of the study. The factor loadings and the Cronbach's alphas of each factor are presented in Table 4.

Table 3.8

Factor Analysis on Sustainability

Factor loadings, explained variance, and reliability of the X factors found for the scale of Sustainability.

Item	***Sustainable Lifestyle Behaviors***	***Environmental Actions***
I have changed my personal lifestyle in order to reduce waste (e.g., throwing away less food or not wasting materials).	.78	
I don't think about how my actions may damage the natural environment.	.78	
I recycle as much as I can.	.63	(.38)
Where possible, I choose to cycle or walk when I'm going somewhere, instead of travelling by motor vehicle.	.62	
I always separate food waste before putting out the rubbish when I have the chance.	.53	
I never waste water.		.90
I pick up rubbish when I see it out in the countryside or public spaces		.53
R²	.37	.16
Cronbach's **α**	.72	.34

3.4.7 Demographic Information

As mentioned, participants were also questioned about their background information. First, they were asked if they fit within the age range of Gen Z (1996 - 2010), with a yes or no question. Next, with text entry questions, they were asked to input their age and their country of residence. Through a series of

multiple choice questions, participants were also questioned on their gender – 1) male, 2) female, 3) non-binary/third gender, or 4) prefer not to say –, their level of education – 1) Less than a high school degree, 2) High school graduate (or equivalent, e.g. GED), 3) Some college, but no degree 4) Bachelor's degree, 5) Master's degree, 6) Doctoral degree (PhD), 7) Professional degree (JD, MD) –, and lastly their political viewpoint where 1=very conservative and 5 = very liberal.

3.5 Procedure

The final survey was created by adapting the recommended measurement sequence for a questionnaire presented by Geuens and Pelsmacker (2017, p. 88), as highlighted in Figure 2. By applying this survey structure as a base for this questionnaire, the risks of insignificant and confounded results are minimized.

Figure 2. Geuens & Pelsmacker (2017, p. 88). Recommended sequence of measures in a questionnaire.

The questionnaire used in this study employed the above sequence as inspiration for its final form; however, specific adaptations were made to this base to conceal the study's goals and intentions more effectively, as well as to make the overall survey more cohesive and understandable for its participants.

To begin this questionnaire, participants were first presented with an introduction and an overview of the overall study, similar to what Geuens and Pelsmacker (2017, p. 88) recommend. This initial page provided background information about the study, details about its researchers, instructions for completing the survey, and, most importantly, emphasized the anonymity and confidentiality of participants' responses. This was then followed by a consent question, in which respondents, after reading the introduction and briefing, could decide whether they still wanted to participate.

Once consented, participants were asked whether they fit within the age limits of Gen Z. This question is essential, as this study requires participants to be Gen Z and therefore, those who answered

‘no’ were directed to the end of the study. Following this, participants were asked to provide their exact age and the country in which they currently reside. Asking these two questions contradicts Geuens & Pelsmacker’s (2017, p. 88) sequence; however, they were asked here to first of all make sure all participants are Gen Z and to somewhat personalize the scenario participants receive, as two of the conditions include location and whether someone is ‘living in the Netherlands’ or ‘visiting the Netherlands.’ In order to more strictly follow the sequence in Figure 1, participants later discussed the rest of their sociodemographics.

Participants were then confronted with the stimulus material as suggested by Geuens and Pelsmacker (2017, p. 88). Here, participants were randomly assigned to one of three conditions, in which they viewed either a non-personalized ad, a moderately personalized ad, or a highly personalized ad, along with accompanying scenarios.

Subsequently, participants were presented with scales that addressed the key variables of this study. These include privacy concerns, and reluctance in data-sharing behavior. This was then followed by the mediation variables including perceived creepiness and perceived relevance. The order in which participants viewed the mediating variable scales were also randomized to present more accurate and reliable results, securing that the measures questioned beforehand did not have an influence.

After these scales, participants were presented with a manipulation check to ensure that they had correctly perceived the level of personalization they were shown (high, moderate, or non-personalized). Following this check, participants were then met with scales assessing the potential confounding variables. These variables include the frequency with which participants use Instagram, their trust in the platform, the frequency with which they see personalized ads on Instagram, their general online privacy concerns, and their involvement with sustainability. This order differs from Geuens & Pelsmacker’s (2017, p. 88) sequence, which places the manipulation check after the potential confounding variables; however, as the manipulation check highlights the participants’ perceived personalization of the fictitious ad, their answers could change based on the scales discussed in the potential confounding variables. Additionally, as the survey lasted an average of 8 and a half minutes, placing the manipulation check earlier, while the stimulus material is still somewhat fresh, could help provide more accurate responses.

The final couple of measurements of the survey highlighted the rest of the participants’ sociodemographics, as instructed by Geuens and Pelsmacker (2017, p. 88). Here, they were asked about their gender, level of education and political viewpoint.

Lastly, as participants were deceived throughout this experiment, it is essential to include a debrief regarding the study’s true intention and any hidden elements that deceived them. This included the overall purpose of the study and an explanation of the three different levels of personalized stimulus material, in which they only viewed one. Once fully debriefed, participants were again reassured that their

information was safe and private and were still allowed to withdraw from the study if that was their preference after reading the debrief.

3.6 Ethics

Just as with any experiment, especially within social research, it is important to consider the study's ethical obligations and ensure that the requirements of an ethical study are met. This was first ensured by making participation in the study entirely voluntary. Additionally, informed consent was obtained from all participants through a consent form that provided background information on the study, its researchers, and the participants' rights. Here, participants were also reassured that their information would remain safe, secure, and, most importantly, anonymous. After reading this, they were given the option to consent or not, and they would then be directed to the end of the survey. Additionally, only individuals aged 16 or older were eligible to participate in the survey, ensuring they were above the legal age of consent. There were also no violent or harmful images presented to participants in the conditions using an AI-generated brand that focused on social media advertisements.

As participants were also deceived throughout this survey and experiment, as mentioned above, they were also debriefed at the end of the survey to maintain the study's ethical standards. Here, they were informed about the true purpose of the study, particularly regarding the fictitious personalized ads, as well as how they had been misled. After providing this information, if participants then decided not to participate, they could contact the lead researcher via email to request removal from the study. Including a debrief allows participants to maintain control over their data, thereby reinforcing the study's ethical standards.

3.7 Validity and Reliability

In general, it is crucial for a study to be both valid and reliable in order to yield accurate and meaningful results (Neuman, 2014, p. 300). Both internal and external validity are key when providing accurate results. Here, internal validity "refers to the extent to which researchers can be confident of a cause-and-effect relationship" (Vargas et al., 2017, p. 107). On the other hand, external validity, according to Vargas et al. (2017, p. 107), usually "refers to researchers' ability to generalize from the specific components of one particular experiment to other people, settings, treatments, and outcomes." Maintaining both internal and external validity is crucial in this study, though achieving this balance can be challenging. On the one hand, prioritizing internal validity can compromise external validity; for example, increased control over the stimulus materials often reduces how 'real' they are, and vice versa. To achieve this, efforts were made within the design of this study to strike a careful balance between the two.

This balance is made visible as this study incorporates both an experiment and a survey, ensuring internal validity through controlled manipulations in the experiment and external validity by capturing real-world consumer attitudes, which are made visible through the survey. Furthermore, as a between-subjects design was employed, meaning participants are only exposed to one condition, the study minimizes any learning or transfer effects that could possibly hinder the results (Neuman, 2014, p. 301). Furthermore, a pretest was conducted to "measure the dependent variable of an experiment prior to the treatment" (Neuman, 2014, p. 291). The study's inclusion of a pretest also aids in ensuring valid and reliable stimuli for the experiment, as it was used to confirm the levels of personalization presented in the mock ads. The research-backed operationalization of constructs presented in this study also aided in providing valid research, as it made these concepts more specific and less open to interpretation. This study also included a manipulation check within the questionnaire. As described by Neuman (2014, p. 304), a manipulation check is a "separate measure of independent or dependent variables to verify their measurement validity and/or experimental realism." This plays a key role in limiting validity concerns, as it shows that the participant understood their stimuli correctly and, therefore, provided accurate responses throughout the experiment and survey. Furthermore, the design of a between-subjects experiment enhances the external validity of the study, as it better mimics real-world scenarios where users are typically exposed to only one type of personalized content at a time (Vargas et al., 2017, p. 110). In addition to the above-mentioned reasoning for the validity and reliability of this paper, the study also confirmed the reliability of each scale through a reliability analysis. Any items that improved Cronbach's alpha if deleted were removed, resulting in a more reliable measure.

3.8 Data Analysis

After the responses were recorded, the data collected was exported from Qualtrics and processed and analyzed using SPSS. Before analysis, the data was first examined for any mistakes, missing values, outliers, and clarifications to ensure the validity of the study.

To address the hypotheses, a series of regression analyses, ANOVA analyses, and PROCESS Macro mediation model 4 analysis were conducted (Hayes, 2022, p. 595). Here, the direct relationship between personalized ads and privacy concerns was analyzed, as well as the relationships between personalized ads and emotional responses (perceived relevance or perceived creepiness) and between emotional responses and privacy concerns. Additionally, ANOVA tests highlight the differences in personalization levels (high, moderate, none) concerning mediating perceived emotions (perceived relevance and perceived creepiness) and privacy concerns. Furthermore, linear regression analyses were used to address the relationships between privacy concerns, hesitancy regarding data-sharing behavior,

and emotional responses (creepiness and relevance). Lastly, additional ANOVA tests were conducted to address randomization checks and potential confounding variables mentioned beforehand.

4. Results

4.1 Manipulation Check Test

In order to test whether participants accurately indicated the level of personalization in their presented fictitious ad, an ANOVA was conducted with personalization level as the independent variable and perceived personalization (the manipulation) as the dependent variable. Here, a significant main effect between the three levels of personalization and the participants' perceived personalization was found, $F(2, 147) = 60.28$, $p < .001$, partial $\eta 2 = .45$. Here, the highly personalized ad (M=5.43, SD=1.46) showed a statistically significant difference between the moderately personalized ad (M= 3.67, SD=1.05) and the non-personalized ad (M=2.50, SD=1.74), where those who viewed the highly personalized condition did perceive it as more personalized than the other two ($p < .001$). Additionally, the moderately personalized condition also had a statistically significant difference with the non-personalized ad, where the moderately personalized ad was perceived as more personalized than the non-personalized ad ($p < .001$). These results indicate that participants did perceive the ads at the intended levels of personalization. Therefore, the manipulation check was successful.

4.2 Hypothesis Testing

In order to address H1, indicating that higher levels of personalization would increase privacy concerns more than moderately personalized ads and non-personalized ads, an ANOVA was conducted with personalization level as the independent variable and privacy concerns as the dependent variable. A significant main effect of personalization on privacy was found, $F(2, 147) = 17.02$, $p < .001$, partial $\eta 2 = .19$. Here, participants who viewed a highly personalized ad (M=4.81, SD=1.23) had a statistically significant difference between both those who received a moderately personalized ad (M=3.81, SD=1.37) ($p = .001$) and those who received a non-personalized ad (M=3.10, SD=1.80)($p < .001$) where those who viewed the highly personalized ad felt greater privacy concerts than the other two. Additionally, participants who received a moderately personalized ad (M=3.81, SD=1.37) also had a statistically significant difference with those who received a non-personalized ad (M=3.10, SD=1.80) in their privacy concerns ($p = .034$), where the moderately personalized ad highlighted greater privacy concerns than the non-personalized ad. These results highlight that higher levels of personalization do, in fact, increase privacy concerns. Given these results, H1 is therefore supported.

In order to test H2, suggesting that higher levels of personalization increase perceived creepiness compared to a non-personalized ad, another ANOVA was conducted with personalization as the independent variable and perceived creepiness as the dependent variable. A significant main effect of personalization on privacy was found, $F(2, 147) = 16.8$, $p < .001$, partial $\eta 2 = .89$. Those who were shown a highly personalized ad (M=4.23, SD=1.52) perceived the ad as significantly more creepy compared to

the moderately personalized ad (M=3.14, SD=1.26, $p < .001$) and the non-personalized ad (M=2.52, SD=1.59, $p < .001$) in perceived creepiness. Alternatively, the significance levels between the moderately personalized ad and the non-personalized ad did not have a statistically significant difference (p =.101). Here, H5 can be partially accepted as it suggests that the highest levels of personalization increase perceived creepiness compared to the other levels; however, perceived creepiness does not change between a moderate to non-personalization.

To test H3, which indicates that perceived creepiness increases privacy concerns in response to personalized Instagram ads, was analyzed using a linear regression analysis with privacy concerns as the dependent variable and perceived creepiness as the independent variable (the predictor). The model was found to be significant, $F(1, 148) = 187.45$, $p < .001$, R^2 =.56. Perceived creepiness was found to be a significant positive predictor of Gen Z's privacy concerns ($\beta = .75$, $p < .001$), thereby offering support for H3.

To evaluate H4, which proposed that perceived creepiness mediates the relationship between ad personalization and privacy concerns, PROCESS macro Model 4 (Hayes, 2022, p. 538) was used with 10,000 bootstrap samples and 95% confidence intervals. Personalization was dummy-coded as a multicategorical independent variable (0 = non-personalized, 1 = moderately personalized, 2 = highly personalized), with perceived creepiness as the mediator and privacy concern as the outcome variable. Results showed that ad personalization significantly predicted perceived creepiness, $F(2, 147) = 18.24$, $p < .001$, $R^2 = .20$. Compared to non-personalized ads, both moderately ($b = 0.63$, $p = .034$) and highly personalized ads ($b = 1.76$, $p < .001$) were associated with increased perceptions of creepiness. In the second stage of the model, perceived creepiness significantly predicted privacy concerns ($b = 0.70$, $p < .001$). The direct effect of personalization on privacy concerns was not significant for highly personalized ads ($b = 0.48$, $p = .054$) and moderately personalized ads compared to non-personalized ads ($b = 0.27$, $p = .22$). However, the total effects were significant for both levels: moderately personalized ($b = 0.71$, $p = .018$) and highly personalized ads ($b = 1.72$, $p < .001$), suggesting mediation. Indirect effect analyses using 10,000 bootstrap samples confirmed that perceived creepiness significantly mediated the effect of ad personalization on privacy concerns. For moderately personalized ads, the indirect effect was 0.44 (95% CI [0.03, 0.88]); for highly personalized ads, the indirect effect was 1.24 (95% CI [0.75, 1.77]). Researchers used to think that mediation required a significant total and direct effect (Baron & Kenny, 1986), but that has since been updated. The field now recognizes that a significant indirect effect is sufficient evidence for mediation, even if the direct effect is not significant. Therefore, these findings suggest a partial mediation for both moderately and highly personalized ads. Here, perceived creepiness significantly mediates the indirect effects of the relationship between ad personalization and privacy concerns for both highly personalized ads and moderately personalized ads. However, the direct effect of

personalization, especially at higher levels, was marginally significant ($p = .054$) when accounting for the mediator, and the direct effect of moderately personalized ads when accounting for the mediator was insignificant ($p = .223$).

To directly compare the highly personalized condition with the moderately personalized condition, a second mediation analysis was conducted using moderately personalized ads as the reference group, which was then dummy coded as 0 (1 = non-personalized and 2 = highly personalized). Results showed that highly personalized ads led to significantly higher perceived creepiness compared to moderately personalized ads ($b = 1.14$, $p < .001$), and the indirect effect of perceived creepiness on privacy concerns was also significant (indirect effect = 0.80, 95% CI [0.41, 1.22]). In contrast, the comparison between non-personalized and moderately personalized ads revealed a significant negative indirect effect (indirect effect = –0.44, 95% CI [–0.88, –0.02]), indicating that non-personalized ads led to less perceived creepiness and, consequently, fewer privacy concerns than moderately personalized ones. These results further support the partial mediation model and clarify that perceived creepiness increases significantly with higher levels of personalization, particularly between moderate and high personalization. Overall, these results indicate that despite not having significant direct effects, perceived creepiness still plays a key role in explaining how and why personalization leads to privacy concerns, especially through higher levels of personalization. These results can therefore partially support the fourth hypothesis.

Additionally, another ANOVA was conducted with personalization as the independent variable and perceived relevance as the dependent variable, testing H5, which suggests that higher levels of personalization increase perceived relevance more than moderate and non-personalized ads. Here, a significant main effect of personalization on privacy was found, $F(2, 147) = 24.84$, $p < .001$, partial $\eta 2 = .25$. Participants who viewed highly personalized ads (M=4.78, SD=1.20) had a statistically higher perceived relevance than those who received a moderately personalized ad (M=3.33, SD=1.22) and a non-personalized ad (M=2.88, SD=1.80) in their perceived relevance, where the highly personalized ad was rated significantly more relevant than the other two ($p < .001$). These results thus confirm H5, however only partially, as there was, surprisingly, no statistically significant difference in relevance between moderately and non-personalized ads ($p = .247$).

To test H6, which hypothesizes that perceived relevance decreases privacy concerns in response to personalized Instagram ads, a linear regression analysis was conducted with privacy concerns as the dependent variable and perceived relevance as the predictor (independent variable). The model was found to be significant, $F(1, 148) = 37.82$, $p < .001$, $R^2 = .20$. However, perceived relevance was found to be a significant positive predictor of Gen Z's privacy concerns ($\beta = .45$, $p < .001$), thereby rejecting H6.

To test H7, testing whether perceived relevance mediates the relationship between personalization and privacy concerns, a mediation analysis was conducted using PROCESS Model 4 (Hayes, 2022) with 10,000 bootstrap samples and 95% confidence intervals. Personalization was dummy-coded as a multicategorical independent variable (0 = non-personalized, 1 = moderately personalized, 2 = highly personalized), with perceived relevance as the mediator and privacy concern as the outcome. The total effect of personalization on privacy concerns was significant, $F(2, 147) = 16.21$, $p < .001$, $R^2 = .18$, such that participants in both the moderately ($b = 0.71$, $SE = 0.30$, $p = .018$) and highly personalized ($b = 1.72$, $SE = 0.31$, $p < .001$) conditions reported greater privacy concerns than those in the non-personalized condition. Personalization also significantly predicted perceived relevance, $F(2, 147) = 27.38$, $p < .001$, $R^2 = .27$, with those in the highly personalized condition rating ads as more relevant ($b = 1.98$, $SE = 0.29$, $p < .001$), while the increase in relevance for the moderately personalized condition was not statistically significant ($b = 0.48$, $SE = 0.28$, $p = .089$). In turn, perceived relevance significantly predicted higher privacy concerns ($b = 0.32$, $SE = 0.08$, $p < .001$). When controlling for relevance, the direct effect of high personalization on privacy concern remained significant ($b = 1.08$, $SE = 0.34$, $p = .002$), while the direct effect of moderate personalization was insignificant ($b = 0.56$, $SE = 0.29$, $p = .054$). The overall direct effect model was significant, $F(3, 146) = 16.74$, $p < .001$, $R^2 = .26$. Regarding indirect effects, only the indirect path from high personalization to privacy concerns through relevance was statistically significant ($b = 0.64$, BootSE = 0.22, 95% CI [0.25, 1.12]), while the indirect effect for moderate personalization was not ($b = 0.16$, BootSE = 0.12, 95% CI [–0.04, 0.43]). These results indicate that perceived relevance mediates the relationship between personalization and privacy concern, but only in the highly personalized condition, resulting in an overall partial mediation.

To more precisely assess the relationship between personalization, perceived relevance, and privacy concerns, a second mediation analysis was conducted using moderate personalization as the reference category, again dummy coding the moderately personalized ads as 0 (1 = non-personalized and 2 = highly personalized). This allowed for a direct comparison between high and moderate personalization. While both conditions trended toward increasing perceived relevance and privacy concerns compared to the non-personalized baseline, only the high personalization condition demonstrated statistically significant direct and indirect effects. Specifically, high personalization significantly increased perceived relevance ($b = 1.50$, $p < .001$) and, through this mediator, elevated privacy concerns (indirect effect = 0.49, 95% CI [0.21, 0.82]). In contrast, the moderate personalization condition did not produce a significant indirect effect (indirect effect = –0.16, 95% CI [–0.43, 0.04]) nor a significant increase in perceived relevance ($b = –0.48$, $p = .089$). Moreover, its direct effect on privacy concern was only marginally significant ($p = .054$). These findings reiterate the original analysis where perceived relevance mediates the relationship between personalization and privacy concern, but only in

the highly personalized condition. Despite these significant findings, the direction of the effect contradicted the original hypothesis; instead of reducing privacy concerns, greater perceived relevance increased them. Thus, H7 is rejected.

Lastly, A final linear regression analysis was conducted to test H8, which suggested that increased privacy concerns in response to personalized Instagram ads decrease users' data-sharing behaviour. Here, reluctance to data-sharing was the dependent variable, and privacy concerns represented the independent variable (the predictor). The model was found to be significant, $F(1, 148) = 157.95$, $p < .001$, $R^2 = .52$. Privacy concerns were found to be a significant positive predictor of Gen Z's reluctance to data-sharing ($\beta = 0.72$, $p < .001$). This thereby accepts H8 because higher privacy concerns were associated with a significant increase in participants' reluctance to participate in data-sharing. Specifically, as concerns about personal information increased, participants reported greater hesitation and discomfort in sharing their data on Instagram, supporting the hypothesis that privacy concerns reduce users' willingness to disclose information in response to personalized ads.

4.3 Potential Confounds

In order to secure this study's internal validity and avoid false conclusions, this study also made sure to run randomized checks to test any potential confounding variables. These were done using ANOVA tests for each variable, comparing them to the different levels of personalization. Here, none of the variables presented a significant difference between personalization levels and therefore did not have to be added to the analysis as confounding variables (Appendix D).

Table 4.1

Summary of Hypotheses Testing Results

Hyp	Tested Relationship	Method	*Key Statistics*	*P-value / Indirect Effects*	*Supported?*
1	Personalization → Privacy Concerns	ANOVA	$F(2, 147) = 17.02$, partial $\eta^2 = .19$ High (M=4.81), Mod (M=3.81), Non (M=3.10)	$p < .001$	Yes
2	Personalization → Perceived Creepiness	ANOVA	$F(2, 147) = 16.8$ partial $\eta^2 = .89$ High (M=4.23), Mod (M=3.14), Non (M=2.52)	$p < .001$, ($p = .101$ – Mod vs Non)	Partial

3	Perceived Creepiness → Privacy Concerns	Regression	$F(1, 148) = 187.45$ $R^2 = .56$ $\beta = .75$	$p < .001$	Yes
4	Personalization → Perceived Creepiness → Privacy Concerns	PROCESS Model 4	$F(2,147)=18.24$, $R^2=.20$ (X1) $b = 0.63$ (Mod), $b = 1.76$ (High) $b = 0.70$ (X2)	Indirect Effect: Mod: $b = 0.44$, CI [0.03, 0.88] High: $b = 1.24$, CI [0.75, 1.77]	Partial
5	Personalization → Perceived Relevance	ANOVA	$F(2, 147) = 24.84$ partial $\eta^2 = .25$ High (M=4.78), Mod (M=3.33), Non (M=2.88)	$p < .001$, ($p = .247$ – Mod vs Non)	Partial
6	Perceived Relevance → Privacy Concerns	Regression	$F(1, 148) = 37.82$, $R^2 = .20$, $\beta = .45$	$p < .001$	No
7	Personalization → Perceived Relevance → Privacy Concerns	PROCESS Model 4	$F(2,147) = 27.38$, $R^2 = .27$ $b = 0.48$ (Mod), $b = 1.98$ (High) (X1) $b = 0.32$ (X2)	Indirect Effects: High: $b = 0.64$, CI [0.25, 1.12] Mod: $b = 0.16$, CI [–0.04, 0.43]	No
8	Privacy Concerns → Data Sharing Behaviors	Regression	$F(1, 148) = 157.95$ $R^2 = .52$ $\beta = 0.72$	$p < .001$	Yes

Note. Indirect effects were tested with 10,000 bootstrapped samples via PROCESS v4.2. Confidence intervals that do not include zero are interpreted as statistically significant.

5. Discussion

5.1 Interpreting Results

Overall, this study aimed to examine how levels of personalization within Instagram ads influence users' privacy concerns and data sharing, as well as how the emotional responses of perceived creepiness and perceived relevance can mediate this relationship. The results of this study, as highlighted above, confirmed most of the hypotheses; however, some provided unexpected outcomes.

As expected, the data indicates that as the levels of personalization increase (high, moderate, none), so do a user's privacy concerns. More specifically, the results revealed that the highly personalized ad generated more privacy concerns than both the moderately personalized ad and the non-personalized ad. Additionally, the moderately personalized ad generated more privacy concerns than non-personalized ads. This finding aligns with previous studies, which highlight that the use of personal information in social media advertising, despite its benefits, raises concerns for an individual's privacy (Acquisiti et al., 2015, p. 509; Jung, 2017, p. 305). In short, the more accurately an ad matches a user's preferences, recent online activities, or personal information, the more likely users are to feel concerned for their privacy. Especially as many users may not be fully aware of the extent to which social media, in this case, Instagram, collects their information and follows their actions, this type of information within ads can be quite confronting and therefore result in such heightened privacy concerns (Butcher, 2016, p 13; De Keyzer et al., 2022, p. 149).

As discussed, the result of these privacy concerns when confronted with a personalized ad may be due to the extent to which one perceives the personalized ad as creepy. Our findings first highlight that higher levels of personalization do indeed increase the perceived creepiness of a personalized ad compared to a non-personalized ad, just as indicated by De Keyzer et al. (2022, p. 149) in their results. However, this current finding differs in terms of where a 'tipping point' of personalization is found. In De Keyzer et al.'s (2022, p.149) study, this tipping point of personalization is found between the low and moderate levels of personalization, where advancing from a low to a moderate level heightens one's perceived creepiness; however, higher levels of personalization do not increase it further. The results from this study indicate the opposite. Here, perceived creepiness increases from higher levels of personalization; however, the levels of personalization ranging from moderate to low does not increase perceived creepiness. The results from the current study indicate a tipping point of the personalization paradox between moderate and high levels. These results, therefore, suggest that Gen Z Instagram users exhibit a higher creepiness threshold in terms of personalized advertising on social media. While the findings of De Keyzer et al. (2022, p. 149) point to users being more sensitive to lower signs of personalization, these results could be due to the ages of the participants, as the average age of de Keyzer

et al. (2022, p. 143) study was 45.7, whereas this study focused on Gen Z, with an average age of 23.6 (*SD* = 1.90). As Gen Z has grown up with the Internet and social media, they are more accustomed to personalized algorithms and advertisements. Consequently, their tolerance for personalization may be higher than that of older generations, making them feel less creeped out when confronted with lower levels of personalization compared to others. Additionally, the findings also highlight that perceived creepiness does, in fact, increase users' privacy concerns in response to personalized ads. This response aligns with White et al.'s (2008, p. 41) theory, known as 'personalization reactance,' as well as Malheieros et al.'s (2012, p. 581) definition of perceived creepiness, highlighting the responses of users when they feel as if they are being overly monitored through increased personalization, thus provoking negative feelings towards the ad, including privacy concerns and perceived creepiness.

The findings also provide partial evidence for the mediating role of perceived creepiness between ad personalization and privacy concerns. Here, it was predicted that higher levels of personalization within an advertisement would increase perceived creepiness, which, in turn, would lead to increased privacy concerns. The study's results have shown that only the indirect effects were significant; however, this still highlights a significant mediating effect. The results, therefore, indicate that as the level of personalization increases within an advertisement, so do users' perceptions of creepiness, which then heightens their privacy concerns. This finding, therefore, falls in line with previous literature, as well as ads to it, emphasizing the discomfort users feel when ads seem to get 'too personal' which then leads to users' privacy concerns (De Keyzer et al., 2022, p. 140; White et al., 2008, p. 41; Malheieros et al., 2012, p. 581). However, as only the indirect effects were deemed significant and the direct effect was not significant for highly personalized ads, this could also suggest that there may be other factors at play that have a mediating effect on this relationship such as perceived intrusiveness or brand trust as have been highlighted in other studies that also influence individuals' responses to highly personalized content (Boerman et al., 2017, p. 369-370; De Keyzer et al., 2022, p. 43; Zahirovic et al., 2024, p. 48).

Additionally, the study also found that higher levels of personalization increase the perceived relevance of the ad compared to a non-personalized ad. This result is thus supported by the study done by De Keyzer et al. (2015, p. 126), which suggests that even basic levels of personalization can increase the perceived relevance of an ad due to the phenomenon of self-referencing within advertisements. Additionally, this result aligns with Jung's (2017, p. 304) definition of perceived relevance, which emphasizes the role of personal needs and values, a definition also applied to personalized advertisements. Conversely, this finding contradicts a more recent study done by De Keyzer et al. (2022, p. 149), who found that there is no significant change in perceived relevance when going from a low or moderate to a high level of personalization and found a decrease in personalization when shifting from low to moderate levels. This result differs significantly from the findings of this study, as the highly

personalized condition yielded a higher perceived relevance than the other two conditions. Nevertheless, the results also indicated that there was no significant change in the relationship between low and moderate levels of personalization and perceived relevance, just as seen in the results from perceived creepiness. This could be due to a multitude of reasons, the main one stemming from the tipping point of personalization, wherein, for this study, anything below a moderate level has been considered insufficient in engaging users. As this study did not aim to replicate De Keyzer et al.'s (2022, p. 149) study but rather to expand on it, these contrasting results could be due to the use of different stimuli, samples, and personalization methods. More specifically, as this study utilized fictitious scenarios and visual ads targeting Gen Z and Instagram and employed three key elements of personalization (interests, location, age), De Keyzer et al. (2022) employed a vignette-based representation of real-life personalized Facebook advertisements, with a more broad sample and used different combinations of personalized data for their created levels. As such, the results from both studies differed accordingly, also indicating that the perceptions surrounding personalization of advertisements are ever-changing.

Contrary to expectations, the findings indicate that perceived relevance increases users' privacy concerns. Here, the original hypothesis suggested that perceived relevance would decrease users' privacy concerns, as research suggests that users are more satisfied with relevant, tailor-made advertisements and, therefore, are more accepting and grateful for personalization within their ads (Kim et al., 2022, p. 3; Jung, 2017, p. 307). However, despite the results of this study presenting the opposite of what was predicted, it is also not necessarily that surprising. As users notice how personally relevant the Instagram advertisement is, they could, at the same time, recognize too much of their personal information within the relevance of the ad and, therefore, feel more concerned for their privacy than they would feel grateful for the relevance of the ad, thus suggesting a dual process thinking approach.

In addition, the findings also revealed a significant relationship between perceived relevance as a mediating factor in the relationship between personalization level and privacy concerns. Specifically, highly personalized advertisements increased perceived relevance, which in turn increased a user's privacy concerns, contradicting the original hypothesis. This, like the results from above, contradicts previous studies wherein relevance plays a key role in the benefits side of personalization, including liking the ad, positive brand attitudes, and overall ad effectiveness, which were believed to then mitigate the privacy concerns of users (de Groot, 2022, p. 61; Malheiros et al., 2017, p. 585; Kim & Huh, 2017, p. 96). Instead, in this study, perceived relevance plays a key mediating role in heightening one's privacy concerns. This finding does, however, align with Jung's (2017, p. 307) research, which explains that the more a user perceives an ad to be personalized, the more likely they are to develop privacy concerns. Moreover, as perceived relevance is mainly based on the use of personal, relevant information, just as personalization, their effects on privacy concerns should be similar, thus explaining its mediating role and

the contradictory findings. These results, however, are only the case for highly personalized ads, not for moderately personalized ads, meaning that the perceived relevance was not strong enough to shift participants' perceptions. This again reiterates the personalization tipping point when it comes to Gen Z.

Lastly, the findings also suggest that privacy concerns regarding personalized advertisements result in more user reluctance to data sharing. Although this result was predicted, it does provide interesting insights into the discourse surrounding users' hesitancy in data-sharing behaviors on social media. On the one hand, this result aligns with previous research, which emphasizes that individuals with heightened privacy concerns are less inclined to share personal information online, as they are primarily concerned with the risks (Boerman et al., 2021, p. 3; Paramarta et al., 2018, p. 275). This result also reiterates Acquisti et al.'s (2015, pp. 511-12) findings, which suggest that the risks associated with data misuse, surveillance, and a lack of control over personal information significantly impact user behavior, making them less likely to share such personal information online. On the other hand, however, studies, especially regarding social networking sites, also suggest that in many cases, users are still willing to share their information despite the privacy risks, as for some, the benefits of personalized ads outweigh the cons (Gross & Acquisti, 2005, p. 2; Jeong & Coyle, 2014, p. 57). Here, Jeong and Coyle (2014, p. 57) explain that young social media users do not minimize their online actions due to advertisements but instead hold negative attitudes about advertising. Nevertheless, the results from this study regarding Instagram and Gen Z found that higher privacy concerns also correlate with users being more hesitant in sharing their data, thus affecting the behaviors of social media users.

5.2 Theoretical Implications

The results indicated by this study thus present several theoretical implications regarding the general phenomenon of personalized advertising. These implications can first be addressed through the personalization paradox, as explained by Aguirre et al. (2015, p. 35). Numerous studies that have researched the effects of personalization have not been unanimous in their findings, as they have discovered varied outcomes regarding how people interpret personalized ads. On the one hand, studies have found that the personalization of ads can be effective, thereby increasing positive responses and outcomes regarding the ad (De Keyzer, 2015, p.; Jung, 2017, p. 307). On the other hand, however, other studies have found that personalization within advertisements can lead to negative reactions, such as creepiness or privacy concerns, which can limit the ad's effectiveness (Kim et al., 2021, p. 3; Boerman et al., 2017, p. 363). Here, the current study aligns more closely with the negative side of the personalization paradox, as the results concluded that higher levels of ad personalization also heighten users' privacy concerns.

In line with this, it is also important to address the study's implications on Culnan and Armstrong's (1999) privacy calculus theory. As discussed, this theory suggests a relationship between the expected benefit and the potential costs of sharing private information (Zahirovic et al., 2024, p. 48). In the case of this study, advances were made on the risk-related side of the theory, wherein, when debating between the two possibilities, the participants' answers indicate that the costs outweigh the benefits of personalization. This finding is consistent with De Keyzer et al.'s (2022, p. 149) research, which similarly highlighted an uneven balance where the risks of personalization exceed the advantages. This also contributes to the growing discourse surrounding the accuracy of the privacy calculus theory, as these findings suggest that privacy concerns regarding online personal advertisements limit or even override the perceived benefits of personalization.

Contrary to de Keyzer et al.'s (2022, p. 149) study, however, is the concept of the personalization tipping point. While their findings yielded significant results only between low and moderate levels, indicating that there was no significant difference between moderate and highly personalized ads, which suggests that participants perceived them as the same, the current study identifies the tipping point to be between moderate and high levels of personalization. This contributes to the current discourse surrounding the 'tipping point' of personalization, as it can vary per study and per ad, thereby again presenting personalization as an ongoing, ever-changing phenomenon.

Ultimately, the results revealed some interesting and contrasting insights regarding perceived relevance. Numerous previous studies refer to perceived relevance as a positive contributing factor to ad personalization, wherein more attention, ad engagement, and purchasing intent are thus improved by the relevance of an ad (De Keyzer et al., 2022, p. 141; Jung, 2017, p. 304; Kim & Huh, 2017, pp. 95-96). However, the results from this study present a different pattern, namely that higher perceived relevance is associated with higher privacy concerns, which was not mitigated by the perceived relevance of the ad. This, therefore, challenges the personalization paradox, as it suggests that perceived relevance is a positive benefit of personalization, which has the potential to counterbalance the negatives, such as privacy concerns and creepiness (Aguire et al., 2015, p. 34).

5.3 Societal Implications

In addition to the theoretical implications, this study's results also highlight many overarching societal implications. This can first be addressed by what these results mean for the advertising industry. As discussed, these findings contribute to the discourse on the personalization paradox, specifically demonstrating that the majority of Gen Z Instagram users are more concerned about their privacy when confronted with highly personalized advertisements, which in turn limits their effectiveness. As such, marketers should limit the amount of visible personalization within their ads. This 'visibility', as defined

by the study's conditions, encompasses using a user's personal interests, age, and location. Mainly by using a combination of all three, these personalized advertisements cross the threshold of what is accepted and understood, leading to more negative perceptions and effects. As the results of this study demonstrate, this heightens privacy concerns and makes users more hesitant to share personal information in online settings.

Additionally, the results of this study also present a shift in user expectations. As the majority of the results led to increased privacy concerns, despite also demonstrating positive feelings of perceived relevance, these findings could suggest a growing desire among Gen Z users for more control and transparency over what data is being collected and what is then happening with their data. As privacy is considered a fundamental human right (Dinev & Hart, 2005, p. 8), such control should be placed in the hands of the users themselves; otherwise, the collection, use, and application of personal information with advertisements would thus be unethical. This is something that is slowly becoming a norm in society, particularly in online environments, where users are expected to have a say in how their data is used.

As such, the discomfort with hyper-personalized advertising represented by this study also reinforces a need for stronger data protection policies. Specific laws are already being implemented by certain governments, such as the General Data Protection Regulation (GDPR) in the European Union and the California Consumer Privacy Act (CCPA) in California; however, these are the extent of the laws protecting users' online privacy. As these guidelines highlight policymakers' acknowledgment of the issue regarding online data collection, they are limited to these regions. Recently, Meta platforms also asked users their preferences regarding the collection and use of their personal information; however, they highlighted that such requests were 'part of the laws of your region' (Appendix G). As the online collection of personal data is still limited only to specific areas, the issue remains imminent. Therefore, this study should be used by governments to advocate for the safety and privacy of users, especially as the study extended to participants from the US, where only one out of 50 states provide some extent of security and control for online information, thus highlighting a greater demand for governments to address these issues worldwide. At the same time, however, the majority of the participants were from Europe, which already has regulations in place regarding such issues. This finding suggests that the current regulations may not adequately address the privacy concerns of users. This study could, therefore, be used by policymakers to push for clearer and more extensive laws that protect the privacy of online social media users, thereby maintaining trust and safety in such a constantly evolving media landscape.

5.4 Limitations and Recommendations for Future Research

Just as with any study, it is essential to acknowledge the limitations of this research and propose ideas for future research. To begin, one of the key limitations of this research was its sampling method.

Although convenience and snowball sampling can, in theory, generate a large number of responses, this study struggled with collecting a sizeable number of responses. This, therefore, resulted in a somewhat smaller sample size than initially hoped, which in turn could explain some of the partial acceptances within the hypotheses, as the sample (per condition) may not have been large enough to detect significant effects, even if they exist. With that said it could be beneficial for future studies to provide an incentive for participating in the study. This incentive could take the form of discounts on specific products, entry into a lottery where one or two participants can win a gift card, or altruistic incentives such as donations to charity. Although there is some risk involved in using incentives, in the sense that people may only complete the survey for the reward, potentially not paying sufficient attention to the survey's conditions or requirements, this issue can be mitigated by the inclusion of attention checks. Additionally, it is advisable for future studies to double or even triple the sample size of this study to determine whether the partial acceptance of the results could lead to full acceptance or if the current results are accurate.

In addition to the sampling method, the study's use of AI in creating the stimuli should also be acknowledged as a limitation. Although the stimuli were created following the validated steps of Berlio et al.'s (2024) MADE framework for AI-generated advertising stimuli, which also presents the benefits of AI in marketing research, their use may have also presented an unintentional bias in this study. With that said, artificial intelligence, in general, is frequently portrayed as a threat to users' personal data security, which can consequently negatively affect the responses of participants in this study (Haleem et al., 2022, p. 120). Especially given that this research explores users' privacy concerns as well as perceptions of creepiness, both of which are notably high, it is possible that factors could have also been affected by the study's visible use of AI rather than by the personalization of the ads themselves. With that said, especially regarding the skepticism surrounding AI, future studies should address this by measuring participants' attitudes towards AI to control for pre-existing biases, as well as measure the realism of the ads themselves in order to evaluate the accuracy of their responses.

Lastly, it is also important to acknowledge the limitation that these findings are based on a sample of Gen Z Instagram users, who are mainly from Western countries. As such, these results cannot be generalized to other demographic or cultural contexts. This limitation is particularly evident when compared to a similar study by De Keyzer et al. (2022, p. 149), which included a broader age range, resulting in a different, earlier 'tipping point' of personalization. This difference highlights how age can influence user perceptions. This inability to generalize can also be addressed in relation to the study's focus on Instagram. As scholars, Jeong and Coyle (2014, p. 56) found, "users have different relational boundaries and privacy concerns for each SNS." Platform-specific features can also change how users perceive and respond to personal advertising. Future studies could, therefore, build upon this research and

address these differences through the comparison of different generations or platforms regarding privacy, perceptions, and user behaviors in the context of personalized advertisements.

5.5 Conclusion

In conclusion, the findings presented in this study contribute to the overall research done on the growing phenomenon of personalized advertising. Primarily through examining its relationship with privacy concerns, as well as data sharing behaviors and mediating perceived emotional responses to such personalization, this research contributes to both the practical and theoretical aspects of personalized ads. We find initial evidence that personalization increases privacy concerns among Gen Z users on Instagram. Furthermore, this study examined the mediating role that perceived creepiness and perceived relevance play in influencing personalized ads and privacy concerns, which both generated increased concerns. Many of the hypotheses resulted in partial acceptance, wherein only the higher levels of personalization showed significant relationships compared to moderate and low levels of personalization, and the significance levels between moderate and low levels were mainly insignificant. This, therefore, demonstrates the 'tipping point' of personalization, specifically regarding Gen Z Instagram users, wherein personalization is most recognized and negatively perceived when a higher level of personalization, involving more elements of personalization, is employed. Additionally, these results add to the discourse surrounding the personalization paradox. Especially as most of these findings presented higher privacy concerns, more negative feelings regarding personalization, and greater hesitancy in data sharing, this study suggests that, despite other prior literature findings, many are still uncomfortable with the use of their personal information in advertisements. However, as this practice makes big tech firms' money as well as helps brands save it, the personalization of advertisements won't end. With that said, it can be recommended that moderately personalized advertisements are the safest bet for marketers looking to reach Gen Z audiences on Instagram, as they will be perceived as personalized and relevant, but at the same time, not so much so that privacy concerns and perceived creepiness are accordingly high. In conclusion, as highlighted by De Keyzer et al. (2022, p. 152), future research, marketers, and policy makers should take into account the paradox of personalization in all contexts.

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6. Appendix

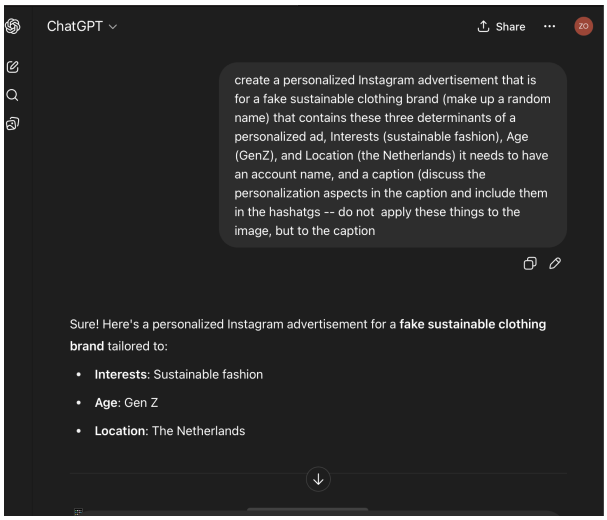
Appendix A: Mock Advertisements (high, moderate, low)

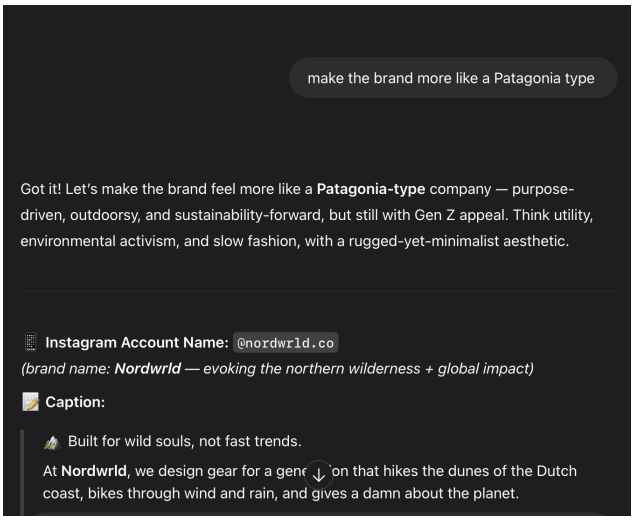
(Highly personalized)

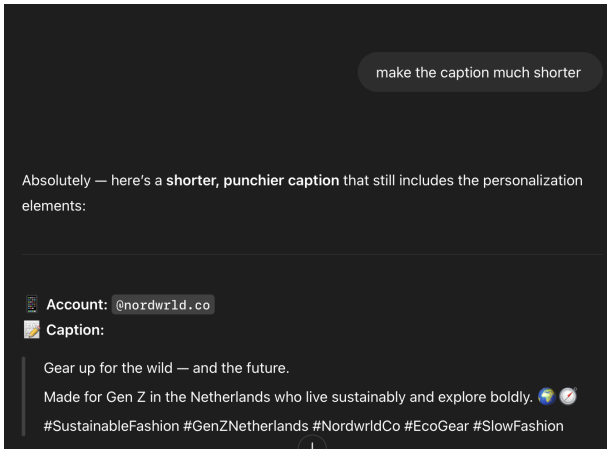
(Moderately personalized)

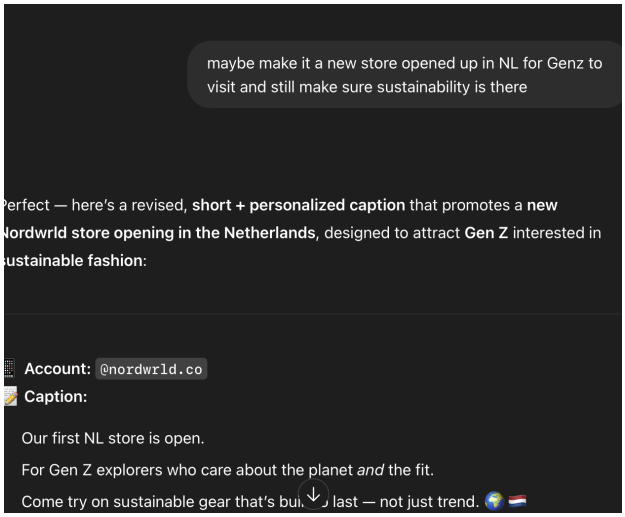
(Non-personalized)

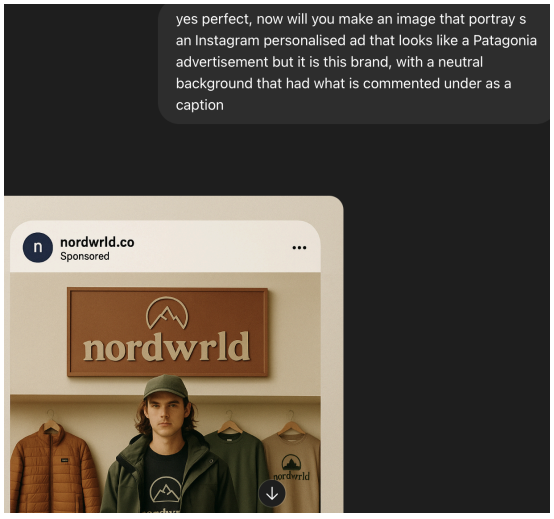
Appendix B: Chat GPT Prompts for Conditions

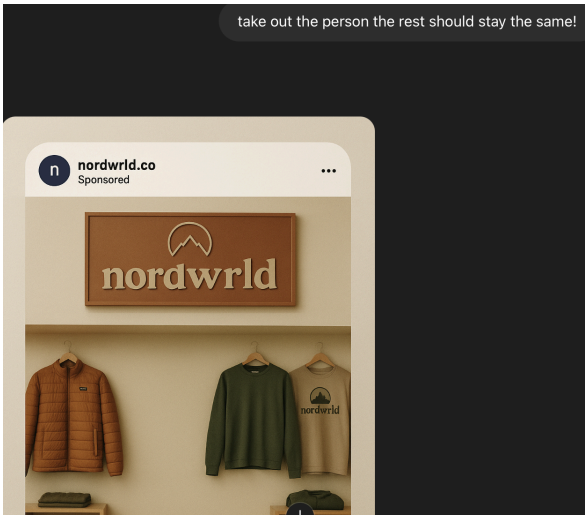




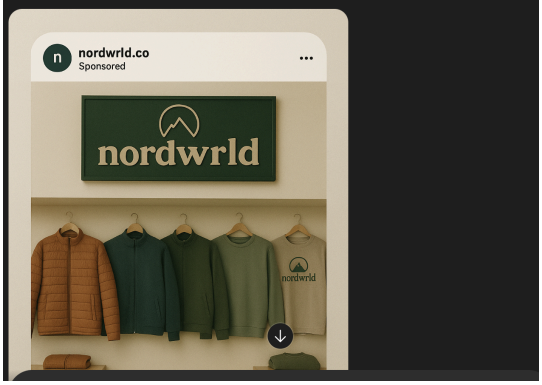




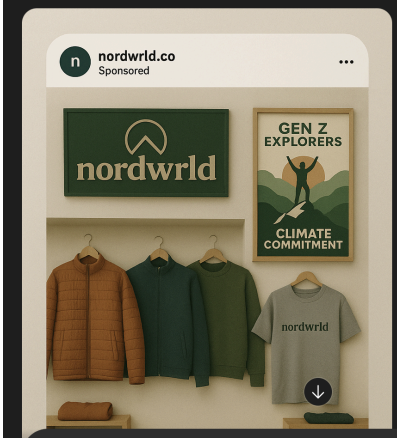




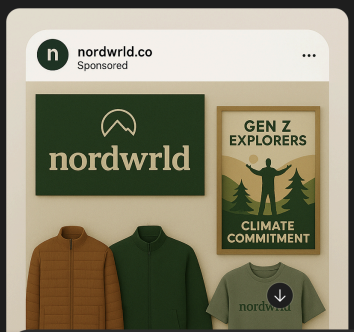
add more clothes and some more color and make the sign dark green



add a poster next to the sign (make it interactive)

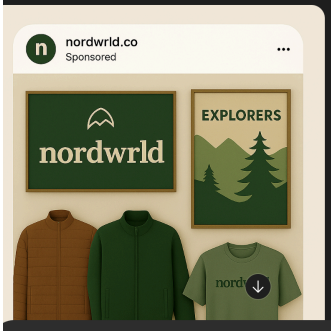


recreate this image but do not use any aspects of personalisation (ei any comments on sustainability, any mention of GENZ or location (nl) -- do not mention these things -- make it a normal ad

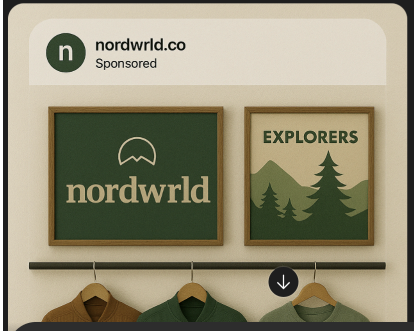


remove the "Genz' and 'climate commitment' and the hashtags 'sustainable gear and 'eco style', make them neutral

make this EXACTLY the same but take out "GEN Z" and "CLIMATE COMMITMENT" in the poster. and change the caption to this "Our new store is now open! Come visit! #Nordwrld



make the image in the 'post' look less animated



Appendix C: Survey Questionnaire

Q1 Dear Participant, Welcome to this survey. Thank you for taking part in this study conducted as part of a Master's Thesis project in Media and Business at Erasmus University. This study is being conducted to investigate advertisements on Instagram. Within this survey, you will be presented with a scenario and visual advertisement and then asked to answer a series of questions about your impressions. The survey will take approximately 5 - 7 minutes to complete. Please thoroughly examine the scenario and accompanying advertisement as well as read and answer each question carefully and honestly. There are no right or wrong answers; we are genuinely interested in your personal experiences and perspectives. **Confidentiality of Data** All data collected will remain completely confidential and anonymous. We will not be able to identify you from your responses. Your participation in this survey involves no risks beyond those of everyday life.
Voluntary Participation Participation is entirely voluntary. You are free to withdraw at any time without any consequences, and you do not need to provide a reason for doing so.
Further Information If you have any questions about this research, either before or after completing the questionnaire, please feel free to contact the responsible researcher, Zoe Bandell (740865zb@eur.nl). This study has been approved by the Ethics Committee of Erasmus University Rotterdam. For any questions about your privacy rights, you can contact the University's Data Protection Officer at fg@eur.nl. Thank you in advance, your time and input in this study is greatly appreciated. Sincerely, Zoe Bandell

Consent If you understand the information above and consent to participate in this study, click on the "I agree" button below to start the questionnaire.

- ○ I agree -- proceed to questionnaire (1)
- ○ I do not agree -- end questionnaire (2)

Skip To: End of Survey If If you understand the information above and consent to participate in this study, click on the "I... = I do not agree -- end questionnaire

End of Block: Welcome

Start of Block: Information for Stimuli

Q23 Are you part of Gen Z (born between 1996 and 2009)?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Are you part of Gen Z (born between 1996 and 2009)? = No

Q26 Please select the country you currently live in

▼ Afghanistan (1) ... Zimbabwe (196)

Q21 How old are you?

_____

End of Block: Information for Stimuli

Start of Block: Condition 1 (Highly Personalized Ad)

Display this question:

If Please select the country you currently live in = Netherlands

Q3 Imagine living in the Netherlands, with a strong interest in sustainable fashion. You follow sustainable clothing brands on social media, and you prioritize buying items that are both stylish and eco-friendly. You're taking a break from your day, casually browsing through photos, stories, and updates on Instagram. As you continue through your feed, you come across this advertisement.
(IMAGE OF FICTITIOUS AD HERE)

Display this question:

If Please select the country you currently live in != Netherlands

Q28 Imagine you are visiting the Netherlands, with a strong interest in sustainable fashion. You follow sustainable clothing brands on social media, and you prioritize buying items that are both stylish and eco-friendly. You're taking a break from your day, casually browsing through photos, stories, and updates on Instagram. As you continue through your feed, you come across this advertisement.
(IMAGE OF FICTITIOUS AD HERE)

End of Block: Condition 1 (Highly Personalized Ad)

Start of Block: Condition 2 (Moderately Personalized Ad)

Display this question:

If Please select the country you currently live in = Netherlands

Q24 Imagine living in the Netherlands. You're taking a break from your day, casually browsing through photos, stories, and updates on Instagram. As you continue through your feed, you come across this advertisement.
(IMAGE OF FICTITIOUS AD HERE)

Display this question:

If Please select the country you currently live in != Netherlands

Q29 Imagine you are visiting in the Netherlands. You're taking a break from your day, casually browsing through photos, stories, and updates on Instagram. As you continue through your feed, you come across this advertisement.
(IMAGE OF FICTITIOUS AD HERE)

End of Block: Condition 2 (Moderately Personalized Ad)

Start of Block: Condition 3 (Non-Personalized Advertisment)

Q25 Imagine you are scrolling through your Instagram feed. You're taking a break from your day, casually browsing through photos, stories, and updates. As you continue through your feed, you come across this advertisement.
(IMAGE OF FICTITIOUS AD HERE)

End of Block: Condition 3 (Non-Personalized Advertisment)

Start of Block: Perceived Privacy Concerns Scale

Q8 After viewing this advertisement, I am concerned ...

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
That Instagram is collecting too much personal information from me. (1)	○	○	○	○	○	○	○
About the privacy of my personal information. (2)	○	○	○	○	○	○	○
About what others might do with my personal information. (3)	○	○	○	○	○	○	○

That my personal information could be used in a way I did not foresee. (4)	○	○	○	○	○	○	○

End of Block: Perceived Privacy Concerns Scale

Start of Block: Willingness to Disclose Personal Information Scale

Q9 After viewing this advertisement,

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
I will think twice before providing my personal information to Instagram advertisers. (1)	○	○	○	○	○	○	○
It will bother me to share my personal information with multiple brands on Instagram. (2)	○	○	○	○	○	○	○

I will care whether Instagram collects too much personal information about me. (3)	○	○	○	○	○	○	○

End of Block: Willingness to Disclose Personal Information Scale

Start of Block: Emotional Response Scale

Q5 Based off the given scenario, to what extent did you find this advertisement...

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
Important (1)	○	○	○	○	○	○	○
Relevant (2)	○	○	○	○	○	○	○
Meaningful (3)	○	○	○	○	○	○	○

Page Break

Q4 Based off the given scenario, to what extent did you find this advertisement...

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
Creepy (1)	○	○	○	○	○	○	○

Disturbing (2)	○	○	○	○	○	○	○
Worrying (3)	○	○	○	○	○	○	○

End of Block: Emotional Response Scale

Start of Block: Manipulation Check

Q24 To what extent do you agree with the following statement considering the advertisement you were shown at the beginning of this survey?

	Strongly agree (1)	Agree (2)	Some what agree (3)	Neither agree nor disagree (4)	Some what disagree (5)	Disagree (6)	Strongly disagree (7)
This ad is tailored to my situation. (1)	○	○	○	○	○	○	○
I believe this ad is customised to my needs. (2)	○	○	○	○	○	○	○
This ad was targeted at me as a unique individual. (3)	○	○	○	○	○	○	○
I believe that this ad is customized to my characteristics. (4)	○	○	○	○	○	○	○
This ad was personalized according to my profile. (5)	○	○	○	○	○	○	○
There was personal information in the ad. (6)	○	○	○	○	○	○	○

The ad was targeted at me. (7)	○	○	○	○	○	○	○
I could recognize myself in the group the ad was targeted at. (8)	○	○	○	○	○	○	○

End of Block: Manipulation Check

Start of Block: Potential Confounding Variables

Q11 How often do you use Instagram?

- ○ Multiple times a day (1)
- ○ Once a day (2)
- ○ A few times a week (3)
- ○ Once a week (4)
- ○ A few times a month (5)
- ○ Rarely (less than once a month) (6)
- ○ Never (7)

Page Break

Q25 To what extent do you agree/disagree with the following statements concerning Instagram?

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
I trust this social media brand (Instagram) (1)	○	○	○	○	○

I have confidence in this social media brand (Instagram) (2)	○	○	○	○	○
This social media brand never disappoints me (Instagram) (3)	○	○	○	○	○

Page Break

Q10 How often do you see personalised ads on Instagram?

- ○ Never (1)
- ○ Sometimes (2)
- ○ About half the time (3)
- ○ Most of the time (4)
- ○ Always (5)

Page Break

Q27 Please answer the following questions regarding your general privacy protection online.

	Never (1)	Sometimes (2)	About half the time (3)	Most of the time (4)	Always (5)
Do you watch for ways to control what people send you online (such as check boxes that allow you to	○	○	○	○	○

opt-in or opt-out of certain offers)? (1)							
Do you remove cookies? (2)	○	○	○	○	○		
Do you use a pop up window blocker? (3)	○	○	○	○	○		
Do you check your computer for spy ware? (4)	○	○	○	○	○		
Do you clear your browser history regularly? (5)	○	○	○	○	○		
Do you block messages/emails from someone you do not want to hear from? (6)	○	○	○	○	○		

Page Break

Q26 To what extent do you agree with the following statements?

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
Where possible, I choose to cycle or walk when I'm going somewhere, instead of traveling by motor vehicle. (1)	○	○	○	○	○	○	○

I never waste water. (2)	○	○	○	○	○	○	○
I recycle as much as I can. (3)	○	○	○	○	○	○	○
I pick up rubbish when I see it out in the countryside or public spaces. (4)	○	○	○	○	○	○	○
I don't think about how my actions may damage the natural environment. (5)	○	○	○	○	○	○	○
I always separate food waste before putting out the rubbish when I have the chance. (6)	○	○	○	○	○	○	○
I have changed my personal lifestyle in order to reduce waste (e.g., throwing away less food or not wasting materials). (7)	○	○	○	○	○	○	○

End of Block: Potential Confounding Variables

Start of Block: Background Information

Q15 What is your gender?

- Male (1)
- Female (2)
- Non-binary / third gender (3)
- Prefer not to say (4)

Page Break

Q18 What is your level of education?

- Less than a high school degree (1)
- High school graduate (or equivalent, e.g. GED) (2)
- Some college, but no degree (3)
- Bachelor's degree (4)
- Master's degree (5)
- Doctoral degree (PhD) (6)
- Professional degree (JD, MD) (7)

Page Break

Q20 Thinking about politics these days, how would you describe your political viewpoint?

- Very conservative (1)

○ 2 (2)

○ 3 (3)

○ 4 (4)

○ Very Liberal (5)

End of Block: Background Information

Start of Block: Debrief

Q5 You have reached the end of this Survey. Thank you for your participation! The purpose of this study was to investigate the effects of different levels of personalisation within Instagram advertisements. Specifically, how such personalised ads can influence people's privacy concerns and, in turn, their data sharing behaviours.
In this experiment, you were randomly assigned to view one of three AI created ads that vary in their levels of personalisation (high, moderate, and non - personalised). The highly personalised ad contained all three key determinants of perceived personalisation (Interests, Age, Location), the moderately personalised ad only used one determinant (Location), and the non-personalised ad was without any personalisation.
These variations are designed to test how people perceive different levels of personalisation within ads and how these changes can affect consumers' privacy concerns and data sharing behaviours.
All responses will remain anonymous, and your information will be confidential. If you have any questions or do not wish for your responses to be recorded and used for this research, please contact Zoe Bandell at 740865zb@eur.nl.

End of Block: Debrief

Appendix D: Insignificant Confounding Variables (ANOVA)

Table 11: Results from ANOVA

Means, Standard Deviations, and One-Way Analyses of Variance in Potential Confounding Variables.

Measures	Non-Personalization		Moderate Personalization		High Personalization		F (2, 147)	n2	p Value
	Mean	SD	Mean	SD	Mean	SD			
General Privacy Concerns	2.50	.94	2.66	.97	2.63	.92	.328	.004	.721
Sustainability	3.16	.910	3.14	.901	3.15	.847	.021	.0	.979
Instagram Trust	4.93	.888	4.69	.893	4.61	.936	1.467	.02	.234
Instagram Usage	1.15	.362	1.19	.576	1.10	.358	.578	.008	.562
Personalized Ads Frequenecy	3.22	.800	3.45	.841	.3.37	.950	.780	.011	.460
Politics	3.90	.723	3.86	.687	3.98	.754	.376	.005	.687

Appendix E: AI Declaration

Declaration Page: Use of Generative AI Tools in Thesis

Student Information
Name: Zoe Bandell
Student ID: 740865
Course Name: Master Thesis CM5000
Supervisor Name: Freya de Keyzer
Date: July 3rd, 2025

Declaration:

Acknowledgment of Generative AI Tools
I acknowledge that I am aware of the existence and functionality of generative artificial intelligence (AI) tools, which are capable of producing content such as text, images, and other creative works autonomously.

GenAI use would include, but not limited to:

- Generated content (e.g., ChatGPT, Quillbot) limited strictly to content that is not assessed (e.g., thesis title).
- ~~Writing improvements, including~~ grammar and spelling corrections (e.g., Grammarly)
- Language translation (e.g., DeepL), without generative AI alterations/improvements.
- Research task assistance (e.g., finding survey scales, qualitative coding verification, debugging code)
- Using GenAI as a search engine tool to find academic articles or books (e.g.,

☒ I declare that I have used generative AI tools, specifically Grammarly and ChatGPT, in the process of creating parts or components of my thesis. The purpose of using these tools was to aid in generating content or assisting with specific aspects of thesis work.

Extent of AI Usage

☒ I confirm that while I utilized generative AI tools to aid in content creation, the majority of the intellectual effort, creative input, and decision-making involved in completing the thesis were undertaken by me. I have enclosed the prompts/logging of the GenAI tool use in an appendix below.

Ethical and Academic Integrity

☒ I understand the ethical implications and academic integrity concerns related to the use of AI tools in coursework. I assure that the AI-generated content was used responsibly, and any content derived from these tools has been appropriately cited and attributed according to the guidelines provided by the instructor and the course. I have taken necessary steps to distinguish between my original work and the AI-generated contributions. Any direct quotations, paraphrased content, or other forms of AI-generated material have been properly referenced in accordance with academic conventions.

By signing this declaration, I affirm that this declaration is accurate and truthful. I take full responsibility for the integrity of my assignment and am prepared to discuss and explain the role of generative AI tools in my creative process if required by the instructor or the Examination Board. I further affirm that I have used generative AI tools in accordance with ethical standards and academic integrity expectations.

Signature:
Zoe Bandell

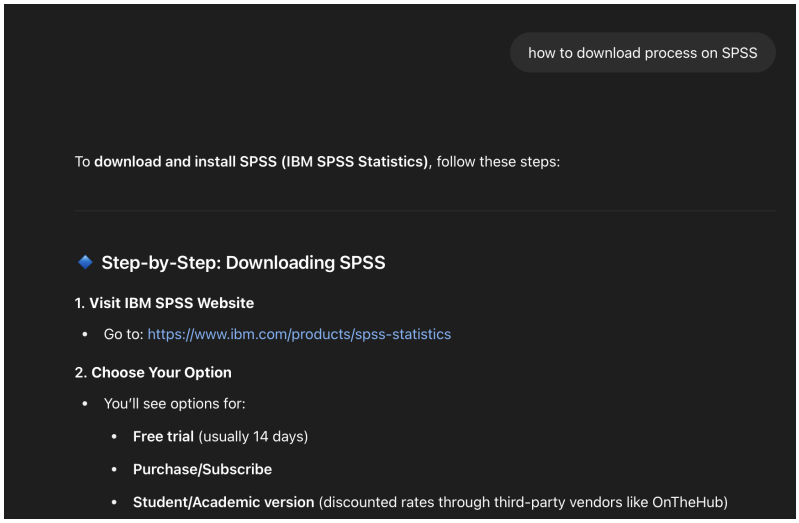
Date of Signature: July 3, 2025

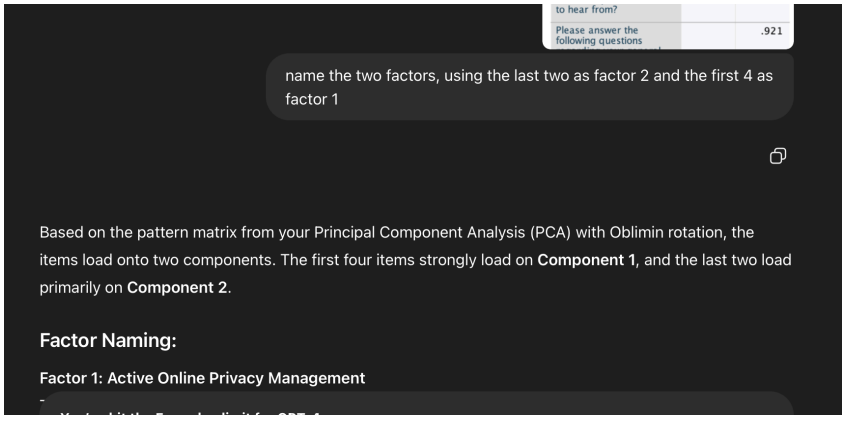
☐ I declare that I have NOT used any generative AI tools and that the assignment concerned is my original work.

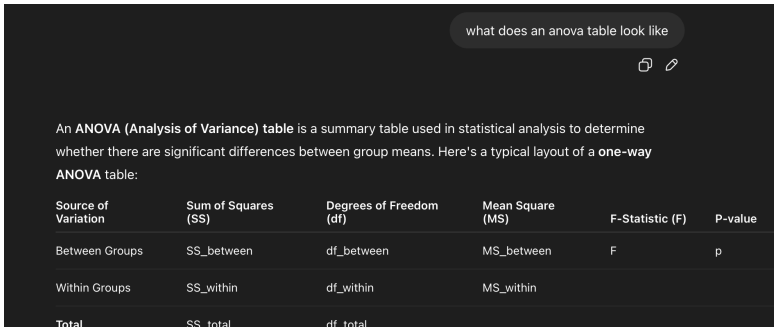
Signature: [digital signature]
Date of Signature: [Date of Submission]

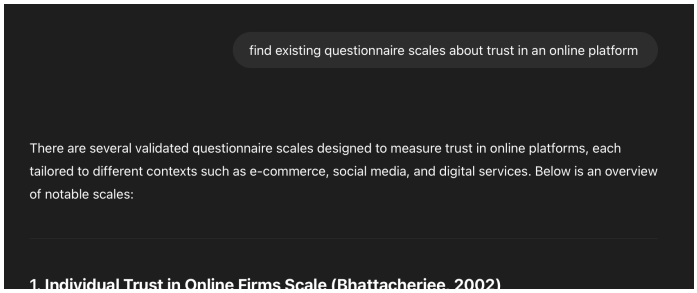
Appendix F: Chat GPT Prompts

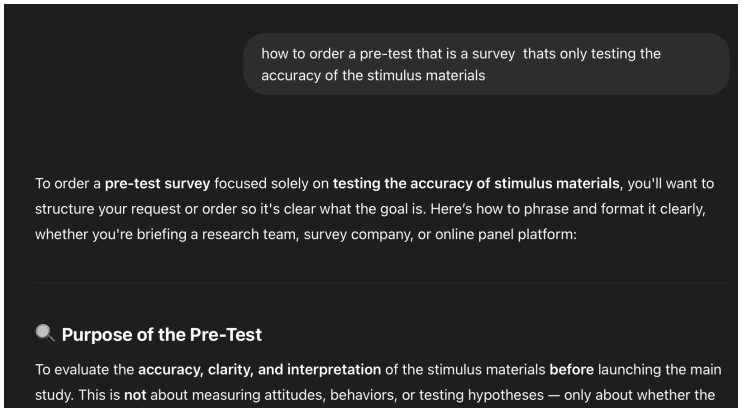
AI Declaration 2

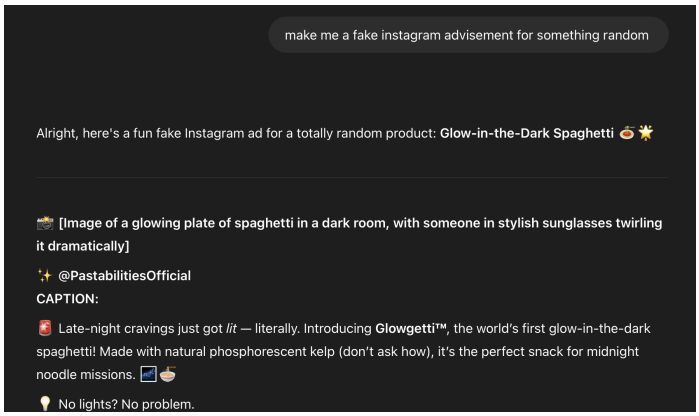




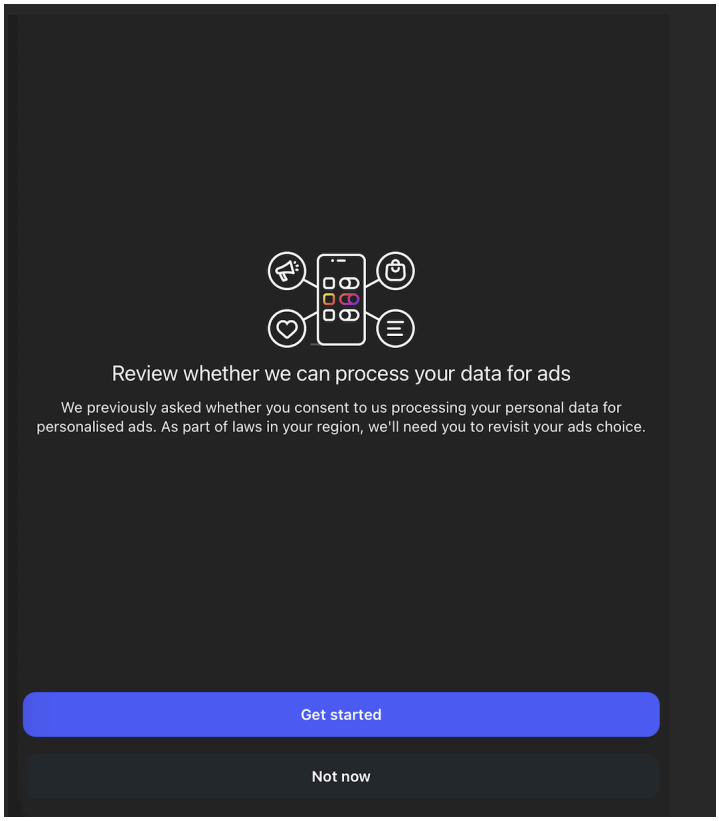





how to order a pre-test that is a survey thats only testing the accuracy of the stimulus materials
To order a **pre-test survey** focused solely on **testing the accuracy of stimulus materials**, you'll want to structure your request or order so it's clear what the goal is. Here's how to phrase and format it clearly, whether you're briefing a research team, survey company, or online panel platform:
🔍 **Purpose of the Pre-Test**
To evaluate the **accuracy, clarity, and interpretation** of the stimulus materials **before** launching the main study. This is **not** about measuring attitudes, behaviors, or testing hypotheses — only about whether the


make me a fake instagram advisement for something random
Alright, here's a fun fake Instagram ad for a totally random product: **Glow-in-the-Dark Spaghetti** 🍝🌟
📸 **[Image of a glowing plate of spaghetti in a dark room, with someone in stylish sunglasses twirling it dramatically]**
✨ **@PastabilitiesOfficial**
CAPTION:
🚨 Late-night cravings just got *lit* — literally. Introducing **Glowgetti™**, the world's first glow-in-the-dark spaghetti! Made with natural phosphorescent kelp (don't ask how), it's the perfect snack for midnight noodle missions. 🌌🍝
💡 No lights? No problem.

Appendix G: Instagram Personal Data Controls



Appendix H: Pretest Survey

Start of Block: Background

Q1 Dear Participant, Thank you for your interest in this research. You are being invited to take part in a pre-test to help evaluate and refine the materials and procedures for a future research project. The survey will take approximately 3 minutes to complete. There are no right or wrong answers; we are genuinely interested in your perspective. Confidentiality of Data All data collected will remain completely confidential and anonymous. We will not be able to identify you from your responses. Your participation in this survey involves no risks beyond those of everyday life. Voluntary Participation Participation is entirely voluntary. You are free to withdraw at any time without any consequences, and you do not need to provide a reason for doing so. Further Information If you have any questions about this research, either before or after completing the questionnaire, please feel free to contact the lead researcher Zoe Bandell (740865zb@eur.nl). I greatly appreciate your time and input in this study. Sincerely, Zoe Bandell

End of Block: Background

Start of Block: Consent

Q1 If you understand the information above and freely consent to participate in this study, click on the "I consent" button below to start the questionnaire.

o I consent -- proceed to questionnaire (1)

o I do not consent -- end questionnaire (2)

Skip To: End of Survey If If you understand the information above and freely consent to participate in this study, click on... = I do not consent -- end questionnaire

End of Block: Consent

Start of Block: GenZ?

Q2 Are you part of Gen Z (born 1995-2012)?

o Yes (1)

o No (2)

Skip To: End of Survey If Are you part of Gen Z (born 1995-2012)? = No

End of Block: GenZ?

Start of Block: Demographics

Q3 What is your gender?

o Male (1)

o Female (2)

o Non-binary / third gender (3)

o Prefer not to say (4)

Q4 What is your level of education?

o Less than a high school degree (1)

o Highschool graduate (or equivalent, e.g. GED) (2)

o Some college, but no degree (3)

o Bachelor's degree (4)

o Master's degree (5)

o Doctoral degree (6)

o Professional degree (7)

Q5 Please select the country you currently live in

▼ Afghanistan (1) ... Zimbabwe (195)

End of Block: Demographics

Start of Block: Highly Personalised Ad Condition

Display this question:

If Please select the country you currently live in = Netherlands

Living Imagine living in the Netherlands, with a strong interest in sustainable fashion. You follow sustainable clothing brands on social media, and you prioritize buying items that are both stylish and eco-friendly. One day, you receive this advertisement on Instagram.

Display this question:

If Please select the country you currently live in ≠ Netherlands

Visiting Imagine you are visiting the Netherlands, with a strong interest in sustainable fashion. You follow sustainable clothing brands on social media, and you prioritize buying items that are both stylish and eco-friendly. One day, you receive this advertisement on Instagram.

Q6 To what extent do you agree with the following statements considering only this scenario and advertisement?

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This ad is tailored to my situation (1)	o	o	o	o	o
I believe this ad is customised to my needs (2)	o	o	o	o	o
This ad was targeted at me as a unique individual (3)	o	o	o	o	o

I believe that this ad is customized to my characteristics. (4)	o	o	o	o	o
This ad was personalized according to my profile. (5)	o	o	o	o	o
There was personal information in the ad. (6)	o	o	o	o	o
The ad was targeted at me. (7)	o	o	o	o	o
I could recognize myself in the group the ad was targeted at (8)	o	o	o	o	o

End of Block: Highly Personalised Ad Condition

Start of Block: Moderately Personalised Ad Condition

Display this question:

If Please select the country you currently live in = Netherlands

Q7 Imagine you are scrolling through your Instagram feed while living in the Netherlands. You're taking a break from your day, casually browsing through photos, stories, and updates. As you continue through your feed, you come across this advertisement on Instagram.

Display this question:

If Please select the country you currently live in ≠ Netherlands

Q8 Imagine you are scrolling through your Instagram feed while visiting the Netherlands. You're taking a break from your day, casually browsing through photos, stories, and updates. As you continue through your feed, you come across this advertisement on Instagram.

Q9 To what extent do you agree with the following statements considering only this scenario and advertisement?

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)

This ad is tailored to my situation (1)	o	o	o	o	o
I believe this ad is customised to my needs (2)	o	o	o	o	o
This ad was targeted at me as a unique individual (3)	o	o	o	o	o
I believe that this ad is customized to my characteristics. (4)	o	o	o	o	o
This ad was personalized according to my profile. (5)	o	o	o	o	o
There was personal information in the ad. (6)	o	o	o	o	o
The ad was targeted at me. (7)	o	o	o	o	o
I could recognize myself in the group the ad was targeted at (8)	o	o	o	o	o

End of Block: Moderately Personalised Ad Condition

Start of Block: Non-Personalized Ad Condition

Q10 Imagine you are scrolling through your Instagram feed. You're taking a break from your day, casually browsing through photos, stories, and updates. As you continue through your feed, you come across this advertisement on Instagram.

Q11 To what extent do you agree with the following statements considering only this scenario and advertisement?

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This ad is tailored to my situation (1)	o	o	o	o	o
I believe this ad is customised to my needs (2)	o	o	o	o	o
This ad was targeted at me as a unique individual (3)	o	o	o	o	o
I believe that this ad is customized to my characteristics. (4)	o	o	o	o	o
This ad was personalized according to my profile. (5)	o	o	o	o	o
There was personal information in the ad. (6)	o	o	o	o	o
The ad was targeted at me. (7)	o	o	o	o	o
I could recognize myself in the group the ad was targeted at (8)	o	o	o	o	o

End of Block: Non-Personalized Ad Condition