Title: Fostering consumer acceptance of smart glasses: The moderating role of price sensitivity

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ABSTRACT

Smart glasses have not taken off globally as expected. Unfortunately, limited research exists on the factors critical to consumer acceptance of this novel technology. This study fills this gap by investigating how individuals perceive the usefulness and intention to use smart glasses. Using an augmented value-attitude-behaviour (VAB) model, we analyze Amazon Echo Frames to examine consumer utility perception. Wearable comfort, perceived fashionability, and lifestyle compatibility play a significant role in how valuable consumers find smart glasses. This, in turn, influences their attitude and intention to use. Interestingly, price sensitivity negatively moderates the link between perceived value and attitude toward the product but not attitude-intention to use. Overall, our findings explain 78.6% of why people may adopt smart glasses, offering valuable insights for both research and industry to improve their design and marketing strategies.

KEYWORDS

- Smart glasses
- augmented VAB model
- context-specific factors

1. Introduction

Virtual Reality (VR) and Augmented Reality (AR) are growing rapidly, attracting scholars to research their diverse applications (Alsharhan, Salloum, and Aburayya 2022; Rauschnabel, Felix, and Hinsch 2019). Virtual/augmented smart glasses not only enable AR/VR experiences but also serve as fashion accessories (Rauschnabel et al. 2016). The smart glasses market is projected to exceed $30bn by 2030, a significant increase from $9bn in 2021 (Custom Market Insights 2022). This growth is mainly driven by massive investments from major tech and fashion players like Amazon, Google, Microsoft, Vuzix, Facebook, and Ray-Ban. Despite weak global demand (Research and Markets 2023), we argue that understanding consumers' perceptions of smart glasses' utility, especially among younger generations, could enhance adoption rates.

Scholars have explored some of the crucial factors for the successful take-up of technology products (Caldarelli, Ferri, and Maffei 2017; Ferri et al. 2021a), including smart glasses technology (Alsharhan, Salloum, and Aburayya 2022; Herz and Rauschnabel 2019; Rauschnabel 2018; Rauschnabel, Brem, and Ivens 2015, 2018). Existing research about smart glasses highlights technical features (Al-Maroof, Alfaisal, and Salloum 2021; Alsharhan, Salloum, and Aburayya 2022; Holdack, Lurie-Stoyanov, and Fromme 2020; Rauschnabel, He, and Ro 2018), privacy concerns (Rauschnabel, Brem, and Ivens 2015; Rauschnabel, He, and Ro 2018), perceived benefits and wearable comfort (Herz and Rauschnabel 2019). However, past research has not fully explored how context influences perceived value or how price sensitivity may impact the intention to use. Additionally, they primarily focus on AR and/or VR-enabled smart glasses (Alsharhan, Salloum, and Aburayya 2022; Herz and Rauschnabel 2019; Rauschnabel, Brem, and Ivens 2015, 2018) rather than emerging categories like smart audio glasses.

In response to Rauschnabel's (2018) call for further research in this area, our study attempts to enhance understanding of the adoption and perceptions of the potential users of smart glasses, specifically Amazon Echo Frames, which prioritise hands-free communication and multi-tasking through voice assistants like Alexa and Google Assistant (Ritzen 2022). We

address the current knowledge gap by examining how context and price sensitivity influence perceived value and adoption intentions for these audio glasses.

In contrast to prior studies, our analysis extends beyond the direct examination of three context-related factors (wearable comfort, perceived fashionability, and lifestyle compatibility) on the smart glasses' perceived value. We also analyzed the indirect effects of these context-specific factors, specifically, we explore how these factors influence attitude through perceived value, and subsequently, how they impact the intention to use smart glasses, with attitude and perceived value acting as serial mediators. We adopted the value-attitude-behaviour (VAB) model which was espoused by Homer and Kahle (1988) and utilised in numerous fields in the literature (Lee et al. 2021; Sadiq, Adil, and Paul 2022). In addition to the limited prior research on wearable comfort in smart fashion adoption (Chang, Lee, and Ji 2016; Herz and Rauschnabel 2019), our study evaluates wearable comfort concerning individuals' perceptions of smart fashion utility within the domain of smart audio glasses.

Lastly, previous studies have viewed price as a determinant of attitude, value, and intention to use smart glasses (Rauschnabel, Felix, and Hinsch 2019; Zuidhof et al. 2024; Yutong et al. 2021; Chua et al. 2015), whereas we examined for the first time how price sensitivity moderates the relationships between perceived value, attitude, and intention to use, thus addressing a research gap and offering a different perspective.

This study is the first, to the authors' knowledge, to deploy the augmented VAB model to examine factors driving acceptance of the Amazon Echo Frame with a focus on the moderating role of price sensitivity. The findings offer valuable insights for designers and marketers on how to shape individuals' perceptions of smart glasses' utility to increase adoption rates.

The remainder of the paper is organised as follows: firstly, a literature review and development of hypotheses are presented. This is followed by methodology and detailed data analysis and results. Finally, conclusions and implications are discussed.

2. Literature review

Recent studies have increasingly focused on the acceptability of technology-based products (Ferri et al. 2021b), examining factors influencing their adoption. Specifically, Al-Maroof, Alfaisal, and Salloum (2021) found that privacy, motivation, and trust contribute to the perceived usefulness and ease of use, which in turn influence the adoption of Google Glasses. Holdack, Lurie-Stoyanov, and Fromme (2020) highlighted the importance of perceived usefulness and enjoyment in shaping attitudes, which predicts the intention to use AR glasses.

Herz and Rauschnabel (2019) found that health and privacy risks reduce the adoption rate of smart glasses, while virtual embodiment and virtual presence increase the adoption of VR glasses. Al-Maroof, Alfaisal, and Salloum (2021) found that functionality, trust, and privacy are determinants of individuals' perceptions of the usefulness and ease of use of Google Glass.

Rauschnabel, Brem, and Ivens (2015) suggested that emotionally stable, open-to-experience consumers are more product-aware and that the expected functional benefits and social conformity are linked to the adoption intention. Rauschnabel (2018) claimed that the utilitarian, hedonic, social, and symbolic benefits of using smart glasses lead to the potential adoption of smart glasses.

This study applies an augmented VAB model to explore smart glasses' adoption, leveraging prior research. Despite its comprehensive analysis, the VAB framework (Homer and Kahle 1988) remains overlooked in this field. The VAB model, proposed by Homer and Kahle (1988), posits that values influence attitudes, which in turn influence behaviour (Cheung and To 2019). Whatever the consumer perceives as valuable will determine the attitude and behaviour toward products and services (Rauschnabel, He, and Ro 2018). Various aspects of products/services must meet the acceptable standard of consumers' perception of value to attract positive behaviours toward such offerings (Homer and Kahle 1988). Extensive research has expanded on the VAB framework, with studies applying it to technology-related products. For example, Weretki et al. (2021) **[Q5]** applied the VAB model to study the relationship between the experiential value of gamified experience and information-sharing behaviour in service ecosystems, while Lee et al. (2021) explored how consumer-perceived values and attributes of 3D printed food influence purchase intention.

2.1. Perceived fashionability, wearable comfort, and perceived value

Wearable comfort and perceived fashionability are essential for smart glasses' acceptance (Herz and Rauschnabel 2019) though their joint impact on utility perception lacks validation. Wearable comfort refers to how comfortable smart glasses

are to wear, while perceived fashionability reflects how stylish wearing them feels. Perceived fashionability has also been described as the overall evaluation of the device design (Herz and Rauschnabel 2019), contributing positively to the perceived value of technology-based fashion products, although the authors labelled it as hedonic and utilitarian attitudes (Watchravesringkan, Nelson Hodges, and Kim 2010). While some scholars emphasise wearable comfort's importance for intention toward smart fashion use (Chang, Lee, and Ji 2016; Herz and Rauschnabel 2019), this article argues that wearable comfort is closely related to smart fashion utility perceptions. In sum, it is hypothesised as follows:

H1a: Perceived fashionability is positively related to perceived value.

H1b: Wearable comfort is positively related to perceived value.

2.2. Lifestyle compatibility and perceived value

Lifestyle compatibility refers to the degree to which potential adopters believe using smart glasses is consistent with their professed lifestyles and experiences (see Boateng et al. 2016; Osakwe et al. 2022). Lifestyle compatibility assesses how well that technology aligns with an individual's needs and preferences (see Shah et al. 2020). Studies indicate it influences technology acceptance/rejection (Boateng et al. 2016; Osakwe et al. 2022; Shah et al. 2020). We, therefore, suggest the following hypothesis:

H2: Lifestyle compatibility is positively related to perceived value.

2.3. Perceived value, attitude, and intention to use

Rauschnabel, He, and Ro (2018) suggested that consumer adoption is highest when smart glasses offer utilitarian, hedonic, and symbolic values, operationalised in this study as a second-order perceived value construct. Arruda Filho, Simões, and De Muylder (2019) analyzed the hedonic and utilitarian value's relation to purchase intention for innovative technological products. Moreover, existing research underscores the importance of perceived value (Ofori et al. 2022; Shah et al. 2020) in shaping attitudes and behaviours toward new and existing technologies. Previous studies have also identified that customer-perceived value is central to new technologies/innovations adoption (Lindič and Marques da Silva 2011). We, therefore, propose the following hypotheses:

H3a: Perceived value is positively related to attitude.

H3b: Perceived value is positively related to intention to use.

2.4. Attitude and intention to use

Attitude and intention to use are indirect outcomes of perceived value from the VAB framework proposition(Homer and Kahle 1988). Previous studies indicate that attitude will be positive when the product offers values aligned with consumers' needs (Sadiq, Adil, and Paul 2022). Basoglu et al. (2018) found that attitude and intention to use were positive when smart glasses were perceived as useful, while attitude was negative when respondents' privacy issues were associated with smart glasses. Similarly, Herz and Rauschnabel (2019) found that for every increase in attitude, there is a simultaneous increase in the intention to purchase smart glasses. Evidence across consumer and emerging technologies literature supports the idea that behavioural intention is positively influenced by attitude (Dogra et al. 2023; Osakwe et al. 2022); accordingly, leading to the following hypothesis:

H4: Attitude is positively related to intention to use.

2.5. The moderating role of price sensitivity

Extrinsic cues, such as the price, significantly influence value, attitude, and intention to use smart glasses (Rauschnabel et al. 2016; Zuidhof et al. 2024). Price is a critical determinant influencing consumers' adoption of smart glasses (Yutong et al. 2021; Zuidhof et al. 2024). The smart glasses' price and functionality create limitations for widespread adoption. Yutong et al. (2021) propose that as prices drop, and smart glasses' functional value increases, positive attitudes toward smart glasses' adoption will increase. This suggests that price sensitivity could moderate the effect of perceived value on attitude and further on intention to use smart glasses. Previous consumer studies indicate that price sensitivity moderates the effect

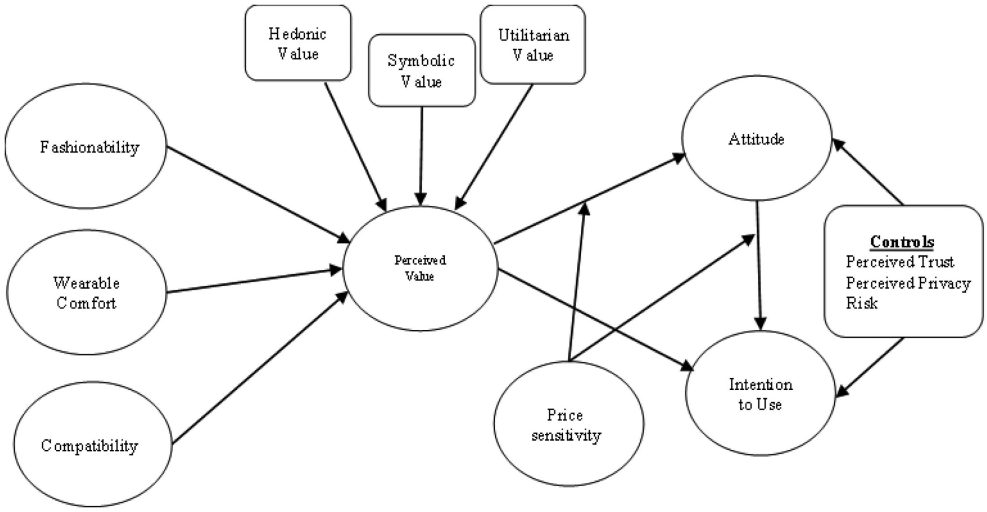
of perceived value on desirable outcomes like customer satisfaction (Chua et al. 2015) and the effect of attitude on purchase intention (Hsu, Chang, and Yansritakul 2017; Srivastava and Gupta 2022). However, the direction of the moderating effect remains open to empirical debate and is subject to the research context (see also Srivastava and Gupta 2022). Therefore, we propose the following hypotheses:

H5a: The impact of perceived value on attitude is affected by price sensitivity.

H5b: The impact of attitude on intention to use is affected by price sensitivity.

The research hypotheses are summarised as a research model (Figure 1).

Figure 1. Proposed research model. **[Q10]**



3. Methodology

3.1. Target population, data collection procedure, and sample

The target population for this study was young digitally literate consumers residing in North Macedonia, Europe. Young consumers tend to be more adventurous, and typically are the first to either try new technologies or regularly use them (Abikari 2024; Osakwe et al. 2022).

We used online surveys, targeting young consumers aged 18-35, utilising a snowball sampling method. Students from the largest university in North Macedonia participated, receiving course credits for completing and sharing the survey. This approach, widely used in technology acceptance research and among young consumers (cf. Abikari 2024; Bailey et al. 2017), yielded 325 responses, with 14 removed due to self-reported rushed completion. Most respondents were females (65.9%) and 81.4% were undergraduates. The average age was 23.8.

3.2. Measurement scales used

The questionnaire included demographic questions and measurement items of the latent variables. The measurement scales were adapted from relevant studies, namely: perceived fashionability (PF) (three items), wearable comfort (WC) (two items), and attitude (ATT) (two items) from Herz and Rauschnabel (2019); lifestyle compatibility (LC) (three items) from Boateng et al. (2016); hedonic (HV) (three items), utilitarian (UV) (three items), and symbolic values (SV) (four items) from McLean and Osei-Frimpong (2019); intention to use (INTU) (five items) construct from Davis (1989) and Rauschnabel et al. (2016); price sensitivity (PS) (three items) from the research of Goldsmith, Flynn, and Kim (2010) and Liang, Choi, and Joppe (2018). Perceived privacy risk (PPR) (three items) and trust (PT) (four items) (control variables) were adapted from the research of McLean and Osei-Frimpong (2019) and Boateng et al. (2016), respectively. These variables were included based on their relevance to smart glasses uptake and/or rejection (Alsharhan, Salloum, and Aburayya 2022; Herz and Rauschnabel 2019; Rauschnabel et al. 2016; Yutong et al. 2021). All the measurement scales are anchored on a five-point Likert scale. To assess the potential central bias of the scale, we analyzed response distribution across the scale along with mean and mediation comparison, as well as mode and variability checks. Results show no significant central bias impacting results.

3.3. Common method bias (CMB) assessment

Preventative measures for CMB included assuring respondents that no answers were right or wrong, voluntary participation, and no collection of any personal data from the respondents. In the header, information on smart glasses and in particular Amazon Echo Frame was provided and we indicated that data would only be used for research purposes. Following Kock's (2015) recommendation, we used a sophisticated collinearity approach, rather than Harman's unrotated factor analytic approach, showing no contamination by CMB as all variance inflation factor (VIF) values were below 3.3.

4. Results

4.1. Measurement model

Using Smart PLS 4(Ringle, Wende, and Becker2022) and following Sarstedt and Cheah's(2019) two-step approach recommendation, we assessed the measurement model. Construct's outer loadings were >0.7 with latent constructs showing alpha values >0.7 indicating high internal data reliability (Hair et al. 2016) (Table 1).

Table 1. Measurement model.

	λ	AVE	CR	Rho_A	α	VIF
Wearable Comfort		0.834	0.91	0.803	0.802	
I think wearing echo frame glasses would be comfortable	0.909					1.810
I'm sure it feels good to wear echo frame glasses	0.918					1.810
Lifestyle Compatibility 'Using echo frame glasses would … '		0.725	0.888	0.811	0.81	
fit my lifestyle	0.851					1.800
fit well with how I like to use smart audio digital devices	0.862					1.851
be compatible with most aspects of my activities	0.842					1.687
Perceived Fashionability		0.722	0.886	0.807	0.807	
I will look good wearing echo frame glasses	0.857					1.862
Echo frame glasses are fashionable	0.821					1.568
I would look modern if I use echo frame glasses	0.87					1.984
Utilitarian Value		0.69	0.87	0.775	0.775	
Using a new echo frame as a digital assistant is a convenient way to just like a headphone	0.803					1.460
Replacing headphones with echo frame as an audio digital assistant would make my life easier	0.851					1.715
Replacing headphones with the echo frame as the audio digital assistant is efficient and comfortable for me	0.837					1.693
Symbolic Value 'Using an echo frame as an audio digital assistant … '		0.654	0.883	0.831	0.823	
enhances my image among my peers	0.845					1.941
would be a status symbol for me	0.855					1.982
would make me seem more valuable among my peers	0.784					1.677
would seem more prestigious to me than those who do not	0.747					1.508

Hedonic Value		0.755	0.902	0.845	0.837	
I would be excited to use the echo frame (smart glasses) to complete my tasks.	0.833					1.775
I would find using a new digital assistant to be enjoyable.	0.89					2.084
Using an echo frame as an audio digital assistant would be entertaining	0.882					2.128
Attitude		0.864	0.927	0.843	0.842	
I think echo frame glasses are good products	0.927					2.126
Largely, I have a positive attitude toward echo frame glasses	0.932					2.126
Perceived Privacy Risk 'I am concerned … '		0.674	0.861	0.768	0.759	
over the confidentiality, if I interact with the echo frame device	0.784					1.447
that my personal details stored with the new device could be stolen	0.828					1.606
that the echo frame device could collect too much information about me	0.85					1.573
Intention to Use		0.714	0.926	0.9	0.9	
I plan to use the echo frame glasses as a digital assistant in the future	0.848					2.362
I intend to use an improved audio-digital assistant in the future	0.852					2.405
I predict I would use the echo frame glasses in the future	0.846					2.333
I intend to recommend this new device (Echo frame) to my peers and relatives.	0.818					2.062
Buying echo frame glasses would be a good idea	0.86					2.436
Price Sensitivity		0.749	0.77	0.554	0.529	
I think the new product would be moderate for me to afford	0.682					1.133
I hope the echo frame wouldn't be expensive to buy	0.809					1.309
My desire to buy the echo frame would depend on my income	0.684					1.177
Perceived Trust		0.593	0.852	0.786	0.769	
I would trust the new echo frame glasses as an audio digital assistant	0.804					1.630
Using echo frame glasses would not disclose my personal information	0.643					1.272
I think the new echo frame glasses would serve what they ought to do	0.814					1.621
I would find echo frame glasses safe for performing my task	0.806					1.655

The constructs' average variance extracted (AVE) was greater than the satisfactory threshold of 0.5(Hair et al. 2016), indicating that convergent validity was achieved. Discriminant validity was confirmed using the Fornell-Larcker criterion, showing the square root of AVE values exceeding correlations among constructs(Henseler, Ringle, and Sarstedt2015) (Table 2). Variance inflation factor (VIF) values were <5, demonstrating no multicollinearity issues (Table 1).

Table 2. Convergent and discriminant validity.

	AVE	CR	1	2	3	4	5	6	7	8	9	10	11
ATT	0.864	0.927	0.929										
LC	0.725	0.888	0.755	0.852									
PF	0.722	0.886	0.675	0.679	0.849								
HV	0.755	0.902	0.8	0.731	0.682	0.869							
PT	0.593	0.852	0.789	0.734	0.674	0.76	0.77						
PS	0.749	0.77	0.718	0.721	0.657	0.7	0.678	0.727					
PPR	0.674	0.861	0.157	0.183	0.264	0.195	0.168	0.307	0.821				
SV	0.654	0.883	0.443	0.617	0.624	0.445	0.49	0.507	0.277	0.809			
INTU	0.714	0.926	0.806	0.841	0.713	0.769	0.757	0.748	0.222	0.565	0.845		
UV	0.69	0.87	0.692	0.757	0.643	0.7	0.704	0.684	0.262	0.566	0.802	0.831	
WC	0.834	0.91	0.738	0.734	0.76	0.709	0.741	0.674	0.243	0.532	0.735	0.661	0.913

Note: In the diagonals and in bold are the square root of the AVEs and the off diagonals are the correlations.

Finally, the hierarchical construct (perceived value) was assessed using standard reflective-formative specification criteria with a disjointed two-staged approach (Wetzels, Odekerken-Schröder, and Van Oppen 2009). In the first stage, the measurement model of all the first-order constructs was assessed. Next, the measurement model of the second-order construct, depicting the association between the second-order component (perceived value) and its first-order components (symbolic, hedonic, and utilitarian values), was assessed. The collinearity was checked with VIF values < 5, indicating no issue with the higher-order construct. Following Sarstedt et al. (2019), the higher-order perceived value was assessed, showing that the three indicators have significant outer weights and outer loadings >0.6 (Table 3).

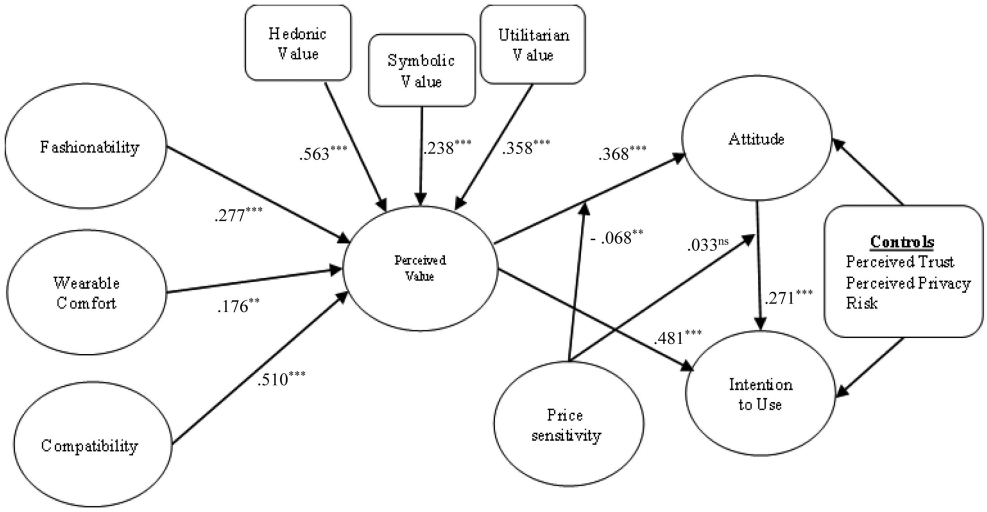
Table 3. Higher-order construct.

HOC	LOC	VIF		Outer Weights	T statistics	*p* values	Outer loadings
PV	HV	1.976		0.563	11.164	<0.001	0.920
	SV	1.481		0.238	6.609	<0.001	0.691
	UV	2.332		0.358	7.229	<0.001	0.887

4.2. Structural model

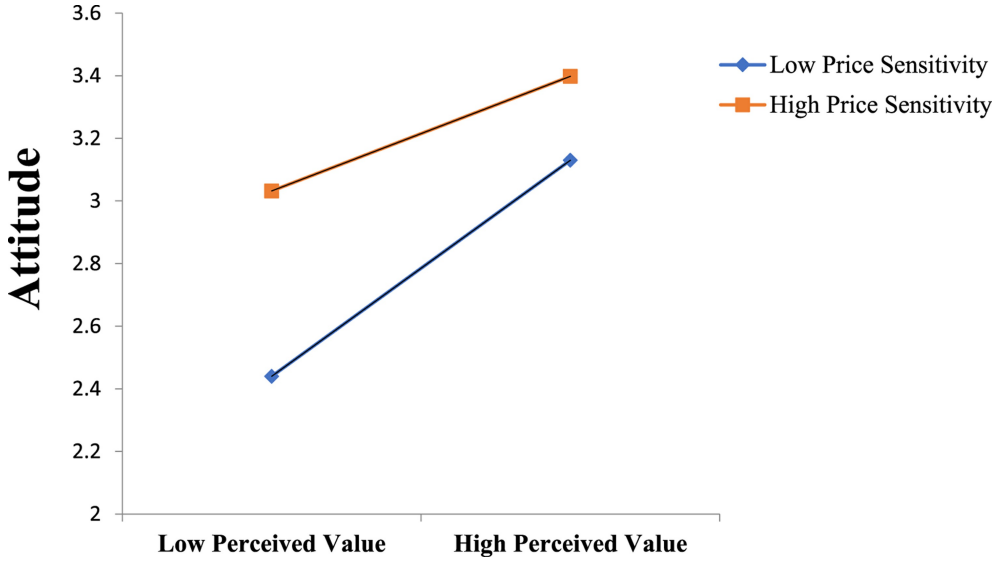
Results revealed that wearable comfort, perceived fashionability, and lifestyle compatibility are significantly related to second-order perceived value (β = 0.176, p<.01; β = 0.277, p<.001 and β = 0.510, p<.001, respectively). Following Cohen (1988) **[Q7]**, lifestyle compatibility has a large effect size, fashionability has a medium effect size and wearable comfort has a small effect size on perceived value (F^2 = 0.474; 0.127;0.044, respectively). Perceived value positively influenced attitude (β = 0.368, p<.001) and intention to use (β = 0.481, p<.001) with F^2 values of 0.135 and 0.251, respectively. As hypothesised, attitude is positively related to intention to use (β = 0.271, p<.001) with an F^2 value of 0.087 (Figure 2 and Appendix).

Figure 2. Structural model.



Additionally, examining the moderating role of price sensitivity, with perceived trust and perceived privacy risk controlled for, we find that the relationship between perceived values and attitude is negatively moderated ($\beta = -0.068$, $p<.001$). Price sensitivity dampens the positive relationship between perceived value and attitude particularly among more price-sensitive users compared to less price-sensitive users (Figure 3). Conversely, with potential users' perceived trust and perceived privacy risk controlled for ($\beta = 0.064$, $p>0.1$; $\beta = -0.008$, $p>0.1$, respectively), price sensitivity failed to significantly moderate the link between attitude and intention to use ($\beta = 0.033$, $p = 0.09$).

Figure 3. Price sensitivity moderates the link between perceived value and attitude.



Finally, R^2 values were employed in assessing the model's explanatory power. The R^2 values for perceived values, attitude, and intention to use were 0.766, 0.736, and 0.785, respectively, suggesting that the model is good at explaining variation in the constructs.

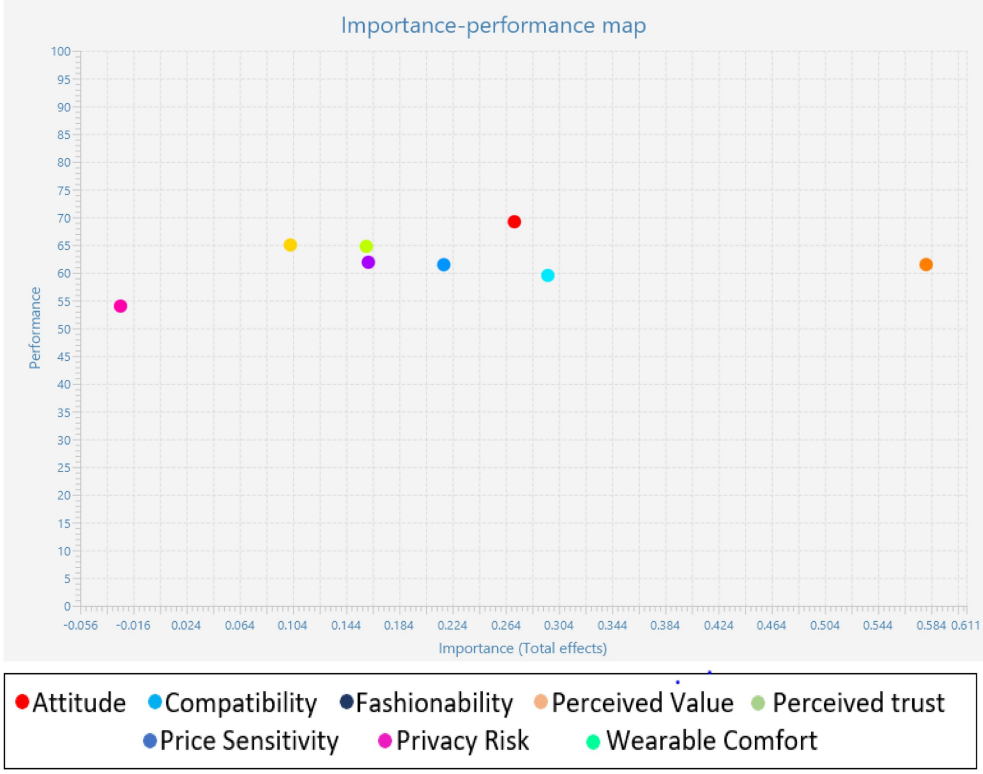
4.3. Further analysis

In additional analyses (Appendix), we found that perceived value mediates the indirect relationship between wearable comfort, perceived fashionability, lifestyle compatibility, and attitude ($\beta = 0.059$, $p<.01$; $\beta = 0.103$, $p<.001$ and $\beta = 0.180$, $p<.001$, respectively) as well as the intention to use ($\beta = 0.080$, $p<.01$; $\beta = 0.138$, $p<.001$ and $\beta = 0.241$, $p<.001$, respectively). Perceived values and attitude serially mediate the indirect relationship between wearable comfort, perceived fashionability, lifestyle compatibility, and intention to use ($\beta = 0.016$, $p<.05$; $\beta = 0.028$, $p<.01$ and $\beta = 0.050$, $p<.01$, respectively).

In the impact-performance map analysis (Ringle and Sarstedt 2016) perceived value emerges as one of the lowest-performing predictors of the intention to use, with a value of 61.493. However, its importance is the highest, with a total effect of 0.580. Hence, prioritising aspects related to perceived value could increase smart glasses' intention to use. Although wearable comfort outperforms perceived value, its importance is lower, with values of 65.022 and 0.102, respectively. Likewise, fashionability shows greater performance but minor importance with values of 61.903 and 0.161

(Figure 4). This indicates that while wearable comfort and fashionability excel in performance, their impact on enhancing intention to use remains relatively small.

Figure 4. Importance-performance map analysis.



5. Discussion and conclusions

This paper employs the augmented VAB model to reveal that lifestyle compatibility, fashionability, and wearable comfort positively influence the perceived value of smart glasses. Perceived lifestyle compatibility, fashionability, and wearable comfort increase are pivotal factors influencing perceived value (Herz and Rauschnabel 2019; Shah et al. 2020). Given the significant standardised regression paths, it is important to underline the decisive role of all three factors in determining the perceived value of smart glasses, with lifestyle compatibility being the strongest factor influencing the perceived value.

Moreover, we confirmed that perceived value as a second-order construct comprising functional, hedonic, and social values positively influences attitude and intention to use, indicating that enhanced perceived value results in a positive attitude and increased intention to use. This aligns with previous studies confirming that a product's high utilitarian, hedonic, and symbolic benefits/value lead to higher chances of adoption and intention to use (Ofori et al. 2022; Rauschnabel, He, and Ro 2018).

Our results further confirmed the indirect influence of context-specific factors on attitude via perceived value and intention to use smart glasses via the attitude and perceived value as serial mediators. This implies that the attitude and intention to use smart glasses can be increased by successfully managing the context-specific factors that positively impact the perceived value. The indirect influence of lifestyle compatibility on attitude (via perceived value) and intention to use (via perceived value and attitude) is the strongest compared to the indirect influence of the other two context-specific factors. Namely, product lifestyle compatibility, perceived fashionability, and wearable comfort are direct and indirect antecedents of perceived value, attitude, and users' intention to adopt high-tech products.

Although the price sensitivity does not significantly moderate the link between attitude and intention to use, it significantly and negatively moderates the link between perceived value and attitude when controlling for trust and privacy risk. Specifically, the relationship between perceived value and attitude becomes weaker with the increase in price sensitivity implying that the relationship between perceived value and attitude is stronger for low-price-sensitivity users than for high-price-sensitivity users. These findings enhance our understanding of price sensitivity's moderating role, enriching prior research (Chua et al. 2015; Rauschnabel et al. 2016; Zuidhof et al. 2024).

5.1. Theoretical implications

Theoretically, our findings help advance the claim that the perceived value of high-technology products is determined by context-specific factors (Herz and Rauschnabel 2019; Shah et al. 2020). Our study contributes to the technology acceptance research by augmenting the original VAB model, comprising relevant context-specific factors while controlling for privacy risks and trust perceptions.

Unlike previous research, such as Rauschnabel, He, and Ro (2018), which focused on the direct role of expected benefits and perceived risk on smart glasses's purchase intention, we developed an enriched VAB model. This model integrates fashionability, wearable comfort, and lifestyle compatibility as factors influencing the perceived value of a high-tech product like smart glasses. Also, while past studies analyzed wearable comfort as a determinant of smart fashion use (Chang, Lee, and Ji 2016; Herz and Rauschnabel 2019), we analyzed wearable comfort related to individuals' perceptions of smart fashion utility concerning smart audio glasses.

Furthermore, similar to the studies of Hsu, Chang, and Yansritakul (2017) and Srivastava and Gupta (2022), we incorporated price sensitivity into our model examining its moderating role in the relationships between perceived value, attitude, and intention to use. Previous studies mainly analyzed price as a determinant of attitude, value, intention to use and adoption of smart glasses (Rauschnabel, Felix, and Hinsch 2019; Zuidhof et al. 2024; Yutong et al. 2021) or analyzed price sensitivity as a moderator between perceived value and satisfaction (Chua et al. 2015). This paper has contributed to the field of digital/smart fashion literature (Chang, Lee, and Ji 2016; Herz and Rauschnabel 2019) by identifying price sensitivity as a key factor affecting the link between perceived value and attitude. Our work supports the clues provided in previous research (Zuidhof et al. 2024; Yutong et al. 2021) by conceptually linking together price sensitivity, perceived value, attitude towards the product, and intention to use.

Finally, this study is pioneering in analyzing the structural relationships among context-related factors, perceived value, attitude, and intention to use smart audio glasses like Echo Frame; distinguishing it from prior studies.

5.2. Managerial implications

The managerial implications of this study are severalfold. Firstly, it emphasises the importance for manufacturers and marketing managers of smart glasses like Amazon Echo Frame to emphasise communicating lifestyle compatibility, fashionability, and wearability in their efforts to enhance perceived value leading to a positive attitude and increased intention to use.

Secondly, our findings indicate that the positive effect of perceived value on attitude declines as price sensitivity increases. Low price-sensitive potential users place more emphasis on perceived value when developing an attitude toward the product, compared with high price-sensitive potential users who place more emphasis on the price of the technology. Marketing managers should target low-price sensitive users and position the product based on users' lifestyles, at the same time pointing out the fashionable design and wearability and presenting the high value of the product, which will lead to increased intention to use and ultimately increase in the product's sale.

Thirdly, based on the impact-performance map analysis, perceived value has one of the lowest performances but the highest importance compared to other variables. Despite its low performance, perceived value is crucial in enhancing intention to use. Marketing managers should prioritise increasing perceived value to increase intention to use and ultimately product purchases.

Fourthly, the results indicate that while wearable comfort and fashionability have high performance, they contribute relatively little to increasing intention to use. In contrast, lifestyle compatibility has lower performance than fashionability and wearable comfort and is slightly lower than perceived value. Additionally, the importance of lifestyle compatibility is lower than the perceived value's importance but considerably higher than the fashionability and wearable comfort importance indicating that lifestyle compatibility should be considered a valuable factor right after the perceived value in managing the intention to use smart glasses.

Finally, attitude outperforms perceived value and lifestyle compatibility but is of lower importance than lifestyle compatibility and perceived value in raising the intention to use. Marketing managers should prioritise enhancing perceived value to increase intention to use, while targeting low price-sensitive with a product featuring modern fashionable design and high wearable comfort tailored to their lifestyle.

5.3. Industry and policy implication

As fashionability, comfort, and lifestyle compatibility impact the perceived value, attitude, and intention to use smart glasses, manufacturers should collaborate with fashion brands to design stylish and comfortable models for customers

prioritising style and comfort over cost. Smart glasses must look modern and provide advanced comfort and functionalities that complement customers' daily activities and lifestyles.

This strategy could position them as luxury items in the wearable technology market, appealing to upscale customers. Leveraging social media influencers aligned with the target market can further help strengthen this positioning.

Additionally, regulations on privacy, data security, and safety standards are crucial. Governments could promote the integration of smart glasses into public services and foster the development of applications tailored to public sector needs, thus driving innovation and broader adoption of smart glasses technology.

6. Limitations and future research

The first limitation of this study concerns the generalizability of the results due to the sample being drawn from young consumers in a single country. Future research should broaden the sample to include participants from other countries. Additionally, the study relied on self-reported data, so future studies could analyze actual use rather than intentions to use. Further, this study examined the direct and indirect influence of three context-specific factors on perceived value, attitude, and intention to use. Future studies should incorporate other context-related factors such as cultural values and personality-based factors like openness to experience. Future studies could also focus on analyzing user satisfaction as well as the sustainability aspects related to the new technology use.

Future research can explore additional moderating factors beyond price sensitivity on perceived value, attitude, and intention to use. Moreover, comparative studies between different generations can reveal differences in perceived value, attitude, and intention to use smart glasses among these customer segments. Future studies could also explore how familiarity and comfort with technology moderate the relationship between the perceived value and attitudes and intentions to use smart glasses. Technologically savvy users might find it easier to navigate advanced features, affecting intentions and usage rates. Additionally, the level of trust users have in the security and privacy of the smart glasses can also serve as a moderator in future research.

Disclosure statement

No potential conflict of interest was reported by the author(s **[Q8]**).

Ethical declarations and human participants

The authors declare that our study meets ethical requirements in the country where it has been conducted. Our study does not constitute any harm whatsoever to the research participants. Participation was voluntary with no personal or identifiable information collected. As per the first author's (as well as the third author's) institution, studies like this are low-risk to respondents and do not require formal ethical clearance.

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References

Abikari, M. 2024. "Emotions, Perceived Risk and Intentions to Adopt Emerging E-Banking Technology Amongst Educated Young Consumers." *International Journal of Bank Marketing*, doi:10.1108/IJBM-01-2023-0004.

Al-Maroof, R. S., A. M. Alfaisal, and S. A. Salloum. 2021. "Google Glass Adoption in the Educational Environment: A Case Study in the Gulf Area." *Education and Information Technologies* 26 (3): 2477–2500. doi:10.1007/s10639-020-10367-1

Alsharhan, A., S. A. Salloum, and A. Aburayya. 2022. "Technology Acceptance Drivers for AR Smart Glasses in the Middle East: A Quantitative Study." *International Journal of Data and Network Science* 6 (1): 193–208. doi:10.5267/j.ijdns.2021.9.008

Arruda Filho, E. J. M., J. D. S. Simões, and C. F. De Muylder. 2019. "The Low Effect of Perceived Risk in the Relation Between Hedonic Values and Purchase Intention." *Journal of Marketing Management* 36 (1-2): 128–148. doi:10.1080/0267257X.2019.1697725

Bailey, A. A., I. Pentina, A. S. Mishra, and M. S. Ben Mimoun. 2017. "Mobile Payments Adoption by US Consumers: An Extended TAM." *International Journal of Retail & Distribution Management* 45 (6): 626–640. doi:10.1108/IJRDM-08-2016-0144

Basoglu, N. A., M. Goken, M. Dabic, D. Ozdemir Gungor, and T. U. Daim. 2018. "Exploring Adoption of Augmented Reality Smart Glasses: Applications in the Medical Industry." *Frontiers of Engineering Management* 5 (2): 167–181.

Boateng, H., D. R. Adam, A. F. Okoe, and T. Anning-Dorson. 2016. "Assessing the Determinants of Internet Banking Adoption Intentions: A Social Cognitive Theory Perspective." *Computers in Human Behavior* 65: 468–478. doi:10.1016/j.chb.2016.09.017

Caldarelli, A., L. Ferri, and M. Maffei. 2017. "Expected Benefits and Perceived Risks of Cloud Computing: An Investigation Within an Italian Setting." *Technology Analysis & Strategic Management* 29 (2): 167–180.

Chang, H. S., S. C. Lee, and Y. G. Ji. 2016. "Wearable Device Adoption Model with TAM and TTF." *International Journal of Mobile Communications* 14 (5): 518–537. doi:10.1504/IJMC.2016.078726

Cheung, M. F., and W. M. To. 2019. "An Extended Model of Value-Attitude-Behavior to Explain Chinese Consumers' Green Purchase Behavior." *Journal of Retailing and Consumer Services* 50: 145–153. doi:10.1016/j.jretconser.2019.04.006

Chua, B. L., S. Lee, B. Goh, and H. Han. 2015. "Impacts of Cruise Service Quality and Price on Vacationers' Cruise Experience: Moderating Role of Price Sensitivity." *International Journal of Hospitality Management* 44: 131–145. doi:10.1016/j.ijhm.2014.10.012

Custom Market Insights. 2022. *Global Smart Eyewear Technology Market Forecast,* available at:https://www.custommarketinsights.com/press-releases/smart-eyewear-technology-market/ (accessed 24 May 2023).

Davis, F. D. 1989. "Perceived Usefulness, Perceived Ease of use, and User Acceptance of Information Technology." *MIS Quartely* 13 (3): 319–340. doi:10.2307/249008

Dogra, P., A. K. Kaushik, P. Kalia, and A. Kaushal. 2023. "Influence of Augmented Reality on Shopping Behavior." *Management Decision* 61 (7): 2073–2098. doi:10.1108/MD-02-2022-0136

Ferri, L., R. Spanò, G. Ginesti, and G. Theodosopoulos. 2021b. "Ascertaining Auditors' Intentions to use Blockchain Technology: Evidence from the Big 4 Accountancy Firms in Italy." *Meditari Accountancy Research* 29 (5): 1063–1087. doi:10.1108/MEDAR-03-2020-0829.

Ferri, L., R. Spanò, M. Maffei, and C. Fiondella. 2021a. "How Risk Perception Influences CEOs' Technological Decisions: Extending the Technology Acceptance Model to Small and Medium-Sized Enterprises' Technology Decision Makers." *European Journal of Innovation Management* 24 (3): 777–798. doi:10.1108/EJIM-09-2019-0253

Goldsmith, R. E., L. R. Flynn, and D. Kim. 2010. "Status Consumption and Price Sensitivity." *Journal of Marketing Theory and Practice* 18 (4): 323–338. doi:10.2753/MTP1069-6679180402

Hair, J. F., L. M. Matthews, R. L. Matthews, and M. Sarstedt. 2016. "PLS-SEM or CB-SEM: Updated Guidelines on Which Method to use." *International Journal of Multivariate Data Analysis* 1 (2): 107–123. doi:10.1504/IJMDA.2017.087624

Henseler, J., C. M. Ringle, and M. Sarstedt. 2015. "A New Criterion for Assessing Discriminant Validity in Variance-Based Structural Equation Modelling." *Journal of the Academy of Marketing Science* 43 (1): 115–135. doi:10.1007/s11747-014-0403-8

Herz, M., and P. A. Rauschnabel. 2019. "Understanding the Diffusion of Virtual Reality Glasses: The Role of Media, Fashion and Technology." *Technological Forecasting and Social Change* 138: 228–242. doi:10.1016/j.techfore.2018.09.008

Holdack, E., K. Lurie-Stoyanov, and H. F. Fromme. 2020. "The Role of Perceived Enjoyment and Perceived Informativeness

in Assessing the Acceptance of AR Wearables." *Journal of Retailing and Consumer Services* 65: 102259. doi:10.1016/j.jretconser.2020.102259

Homer, P. M., and L. R. Kahle. 1988. "A Structural Equation Test of the Value-Attitude-Behavior Hierarchy." *Journal of Personality and Social Psychology* 54 (4): 638–646. doi:10.1037/0022-3514.54.4.638

Hsu, C. L., C. Y. Chang, and C. Yansritakul. 2017. "Exploring Purchase Intention of Green Skincare Products Using the Theory of Planned Behavior: Testing the Moderating Effects of Country of Origin and Price Sensitivity." *Journal of Retailing and Consumer Services* 34: 145–152. doi:10.1016/j.jretconser.2016.10.006

Kock, N. 2015. "Common Method Bias in PLS-SEM: A Full Collinearity Assessment Approach." *International Journal of e-Collaboration* 11 (4): 1–10. doi:10.4018/ijec.2015100101

Lee, K. H., K. H. Hwang, M. Kim, and M. Cho. 2021. "3D Printed Food Attributes and Their Roles Within the Value-Attitude-Behavior Model: Moderating Effects of Food Neophobia and Food Technology Neophobia." *Journal of Hospitality and Tourism Management* 48: 46–54. doi:10.1016/j.jhtm.2021.05.013

Liang, L. J., H. C. Choi, and M. Joppe. 2018. "Understanding Repurchase Intention of Airbnb Consumers: Perceived Authenticity, Electronic Word-of-Mouth, and Price Sensitivity." *Journal of Travel & Tourism Marketing* 35 (1): 73–89. doi:10.1080/10548408.2016.1224750

Lindič, J., and C. Marques da Silva. 2011. "Value Proposition as a Catalyst for a Customer Focused Innovation." *Management Decision* 49 (10): 1694–1708. doi:10.1108/00251741111183834

McLean, G., and K. Osei-Frimpong. 2019. "Hey Alexa … Examine the Variables Influencing the Use of Artificial Intelligent in-Home Voice Assistants." *Computers in Human Behavior* 99: 28–37. doi:10.1016/j.chb.2019.05.009

Ofori, K. S., H. Anyigba, O. Adeola, C. Junwu, C. N. Osakwe, and O. David-West. 2022. "Understanding Post-Adoption Behaviour in the Context of Ride-Hailing Apps: The Role of Customer Perceived Value." *Information Technology & People* 35 (5): 1540–1562. doi:10.1108/ITP-06-2019-0285

Osakwe, C. N., M. Hudik, D. Říha, M. Stros, and T. Ramayah. 2022. "Critical Factors Characterizing Consumers' Intentions to use Drones for Last-Mile Delivery: Does Delivery Risk Matter?" *Journal of Retailing and Consumer Services* 65: 102865. doi:10.1016/j.jretconser.2021.102865

Rauschnabel, P. A. 2018. "Virtually Enhancing the Real World with Holograms: An Exploration of Expected Gratifications of Using Augmented Reality Smart Glasses." *Psychology & Marketing* 35 (8): 557–572. doi:10.1002/mar.21106

Rauschnabel, P. A., A. Brem, and B. S. Ivens. 2015. "Who Will buy Smart Glasses? Empirical Results of Two Pre-Market-Entry Studies on the Role of Personality in Individual Awareness and Intended Adoption of Google Glass Wearables." *Computers in Human Behavior* 49: 635–647. doi:10.1016/j.chb.2015.03.003

Rauschnabel, P. A., R. Felix, and C. Hinsch. 2019. "Augmented Reality Marketing: How Mobile AR-Apps Can Improve Brands Through Inspiration." *Journal of Retailing and Consumer Services* 49: 43–53. doi:10.1016/j.jretconser.2019.03.004

Rauschnabel, P. A., J. He, and Y. K. Ro. 2018. "Antecedents to the Adoption of Augmented Reality Smart Glasses: A Closer Look at Privacy Risks." *Journal of Business Research* 92: 374–384. doi:10.1016/j.jbusres.2018.08.008

Rauschnabel, P. A., D. W. Hein, J. He, Y. K. Ro, S. Rawashdeh, and B. Krulikowski. 2016. "Fashion or Technology? A Fashnology Perspective on the Perception and Adoption of Augmented Reality Smart Glasses." *i-com* 15 (2): 179–194. doi:10.1515/icom-2016-0021

Research and Markets. 2023. *Smart Augmented Reality (AR) Glasses: Global Strategic Business Report*. Research and Markets. https://rb.gy/7jsmp.

Ringle, C. M., and M. Sarstedt. 2016. "Gain More Insight from Your PLS-SEM Results: The Importance-Performance map Analysis." *Industrial Management & Data Systems* 116 (9): 1865–1886. doi:10.1108/IMDS-10-2015-0449

Ringle, C. M., S. Wende, and J.-M. Becker. 2022. *SmartPLS 4*. Boenningstedt: SmartPLS. https://www.smartpls.com.

Ritzen, S. 2022. "Best Smart Glasses for 2022: Take Photos and Video, Listen to Tunes, Access Your Virtual Assistant, and More", *Futurism*, available at: https://futurism.com/best-smart-glasses (accessed 23 April 2023).

Sadiq, M., M. Adil, and J. Paul. 2022. "Eco-Friendly Hotel Stay and Environmental Attitude: A Value-Attitude-Behaviour Perspective." *International Journal of Hospitality Management* 100: 103094. doi:10.1016/j.ijhm.2021.103094

Sarstedt, M., and J. H. Cheah. 2019. "Partial Least Squares Structural Equation Modeling Using SmartPLS: A Software Review." *Journal of Marketing Analytics* 7: 196–202. doi:10.1057/s41270-019-00058-3

Sarstedt, M., J. F. Hair, Jr., J. H. Cheah, J. M. Becker, and C. M. Ringle. 2019. "How to Specify, Estimate, and Validate Higher-Order Constructs in PLS-SEM." *Australasian Marketing Journal* 27 (3): 197–211. doi:10.1016/j.ausmj.2019.05.003

Shah, A. M., X. Yan, S. A. A. Shah, and M. Ali. 2020. "Customers' Perceived Value and Dining Choice Through Mobile Apps in Indonesia." *Asia Pacific Journal of Marketing and Logistics* 33 (1): 1–28. doi:10.1108/APJML-03-2019-0167

Srivastava, V., and A. K. Gupta. 2022. "Price Sensitivity, Government Green Interventions, and Green Product Availability Triggers Intention Toward Buying Green Products." *Business Strategy and the Environment* 32 (1): 802–819. doi:10.1002/bse.3176

Watchravesringkan, K., N. Nelson Hodges, and Y. Kim. 2010. "Exploring Consumers' Adoption of Highly Technological Fashion Products: The Role of Extrinsic and Intrinsic Motivational Factors." *Journal of Fashion Marketing and Management* 14 (2). doi:10.1108/13612021011046101

Wetzels, M., G. Odekerken-Schröder, and C. Van Oppen. 2009. "Using PLS Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration." *MIS Quarterly* 33 (1): 177–195. doi:10.2307/20650284

Yutong, Q., J. Hang, J. R. Chen, and P. J. Ng. 2021. "The Impact of Smart Glasses on a new Generation of Users." *International Journal of Business Strategy and Automation (IJBSA)* 2 (4): 1–25. doi:10.4018/IJBSA.286776

Zuidhof, N., S. Ben Allouch, O. Peters, and P. P. Verbeek. 2024. "Perspectives on the Acceptance and Social Implications of Smart Glasses: A Qualitative Focus Group Study in Healthcare." *International Journal of Human–Computer Interaction*, 40(2), 149–159.**[Q9]**

Attachment Files

1 Figure 1.docx *: Figure 1. Proposed research model*

2 Figure 2 - Structual model.docx *: Figure 2 - Structural model*