

The Mirror Is Not Real: Investigating the Psychological Effects of Augmented Reality Filters on Self-Perception and Well-Being

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Abstract

The increasing use of augmented reality (AR) filters on social media platforms has transformed digital self-presentation, influencing users' perceptions of identity, beauty and psychological well-being. This study investigates the impact of AR filters on self-perception, self-esteem, body satisfaction, and mental well-being across different age groups. Employing a mixed-methods research design, the study collected data from 300 active social media users representing Generation Z, Millennials and Older Adults. Quantitative data were gathered using the Rosenberg Self-Esteem Scale (RSES), the Body Appreciation Scale (BAS-2) and the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), while qualitative responses explored participants' experiences and motivations for using AR filters. Statistical analyses, including descriptive statistics, Pearson's correlation, one-way ANOVA and multiple regression, were conducted using IBM SPSS and Python. The findings reveal a significant negative relationship between frequent appearance-enhancing AR filter use and self-esteem, body satisfaction, and psychological well-being. Generation Z participants reported the highest frequency of filter use and greater susceptibility to appearance-related dissatisfaction compared to older adults. Conversely, the study found that creative and entertainment-oriented use of AR filters promoted self-expression, social connectedness and positive emotional engagement. Age emerged as a significant predictor of resilience, with older participants demonstrating healthier self-perception despite exposure to digital enhancement technologies. It emphasizes the need for ethical platform design, digital media literacy initiatives and mental health awareness programs to foster healthier engagement with digitally mediated self-representation while encouraging authentic self-acceptance in contemporary digital culture.

Keywords: *Augmented Reality, AR Filters, Self-Perception, Self-Esteem, Body Image, Mental Well-Being, Social Media, Digital Identity, Filter Dysmorphia, Digital Psychology.*

1. Introduction

The evolution of digital self-presentation has fundamentally reshaped how individuals perceive and evaluate their identities. Among the most pervasive tools influencing this

change are **Augmented Reality (AR) filters**, which overlay virtual effects on real images or videos in real time. Initially designed for entertainment and creative expression, AR filters have become a psychological lens through which users reinterpret their sense of beauty and self-worth.

Social media platforms such as *Instagram, Snapchat and TikTok* have made these filters widely accessible, allowing users to modify facial features, skin tone and even expressions with a single tap. While this capability has democratized digital creativity, it has also blurred the boundaries between authenticity and idealization. Users—particularly adolescents and young adults—often internalize these digitally enhanced appearances as their personal standards of beauty.

The current research investigates the *psychological effects of AR filters on self-perception and well-being*, with an emphasis on self-esteem, body image and emotional balance. Specifically, it explores whether the frequency and type of AR filter use influence self-worth and satisfaction with appearance. By employing a mixed-methods design that integrates quantitative scales with qualitative self-reflection, this study seeks to contribute to the growing field of *digital psychology* and provide evidence-based recommendations for healthier technology engagement.

2. Literature Review

2.1 AR Filters and Digital Self-Representation

Augmented Reality technology enables users to interact with computer-generated elements in real environments. Within social media, AR filters are used to adjust or enhance one's visual presentation. According to **Raimo et al. (2023)**, these digital tools serve as both creative outlets and mechanisms for social comparison. Users curate their digital selves by selecting how they wish to appear, often aligning their self-presentation with societal beauty standards.

2.2. Kleemans et al. (2018) found that exposure to digitally altered images increased appearance comparison tendencies, leading to reduced self-esteem. Similarly, **Fardouly and Vartanian (2016)** emphasized that unrealistic beauty ideals on social media can contribute to heightened self-discrepancy—where individuals perceive a gap between their actual and ideal selves.

2.3. Filter Dysmorphia and Body Image

The term *filter dysmorphia* refers to distress caused by differences between one's filtered appearance and physical reality. **Ramphul and Mejias (2018)** documented an increase in cosmetic surgery consultations among young adults seeking to match their filtered selves. Such findings underscore how AR filters can exacerbate *body dissatisfaction*, especially when self-worth is tied to external validation metrics such as likes and comments.

2.4. Social Comparison and Psychological Well-Being

Festinger's (1954) social comparison theory suggests that individuals evaluate themselves relative to others. In digital contexts, filtered images amplify these comparisons, creating unattainable beauty norms. Prolonged engagement with such imagery can foster envy, anxiety, and lowered well-being (**Vogel et al., 2014**).

However, research also indicates potential positive outcomes. **Raimo et al. (2022)** observed that when filters are used creatively rather than for self-enhancement, they can enhance feelings of amusement, belonging and artistic self-expression. Therefore, the psychological impact of AR

filters is multidimensional, depending on intent, frequency and user awareness.

3. Research Gap

While previous studies have examined general effects of image manipulation on self-esteem, few have specifically analyzed *AR filter usage across age groups*. This study addresses that gap by combining statistical data and thematic responses to understand generational differences in filter use motivations and outcomes.

4. Methodology

4.1 Research Design

The present study employed a *quantitative cross-sectional design* supported by qualitative reflection to examine the relationship between Augmented Reality (AR) filter use and psychological well-being. The quantitative component focused on measurable constructs—self-esteem, body satisfaction and mental well-being—while the qualitative component explored participants' subjective experiences with AR filters through open-ended responses.

A *mixed-methods approach* was chosen to provide a balanced understanding of both statistical associations and individual perceptions. Quantitative data were analyzed

using correlation, regression and ANOVA, while qualitative insights were coded thematically to highlight emerging psychological patterns.

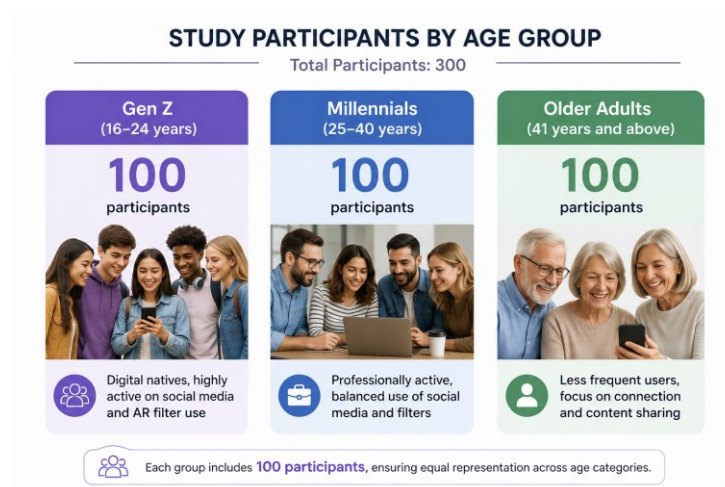
4.2 Participants

A total of 300 *participants* were recruited using stratified random sampling to ensure representation across age groups and genders. The participants were categorized into three cohorts:

Gender distribution was approximately 58% female, 41% male and 1% non-binary or undisclosed. Inclusion criteria required participants to be active users of at least one social media platform featuring AR filters (Instagram, Snapchat, TikTok).

4.3 Instruments

The survey consisted of 25 *items* divided into four sections:



Additionally, three custom questions were included to assess AR filter *frequency* and *intent of use* (creative vs. appearance-based).

4.4 Procedure

Participants completed the online survey anonymously via Google Forms. The questionnaire link was distributed through university mailing lists, social media groups and online communities. Data collection took place over three weeks in February 2025.

Before participation, all respondents were provided an *informed consent form* ensuring confidentiality and voluntary participation. The survey took approximately 12 *minutes* to complete.

4.5 Data Analysis

Data were analyzed using *IBM SPSS (Version 29)* and *Python (pandas, scipy, matplotlib)* for visual representation. Descriptive statistics (mean, SD) were computed for all variables and relationships between AR filter frequency and psychological variables were tested using *Pearson's correlation*.

To test group differences, a *one-way ANOVA* was conducted with post hoc Tukey comparisons. A *multiple regression analysis* assessed the predictive influence of AR filter frequency and age group on self-esteem and well-being.

The formula for the regression model was:

$$Y = \beta_0 + \beta_1(\text{Filter Frequency}) + \beta_2(\text{Age Group}) + \beta_3(\text{Gender}) + \epsilon$$

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where Y represents self-esteem or well-being and ϵ denotes the error term.

All analyses used a **significance threshold of $p < 0.05$** .

5. Results

5.1 Descriptive Statistics

Data from 300 participants were analyzed. Table 1 presents mean scores and standard deviations across the three age groups for AR filter frequency, self-esteem, body satisfaction and well-being.

Table 1: Descriptive Statistics by Age Group

Age Group	Filter Freq (M±SD)	Self-Esteem (M±SD)	Body Sat (M±SD)	Well-Being (M±SD)
Gen Z (16–24)	2.25 ± 0.82	3.32 ± 0.5	3.4 ± 0.43	3.42 ± 0.37
Millennial (25–40)	2.3 ± 0.87	3.35 ± 0.48	3.28 ± 0.49	3.41 ± 0.37
Older Adult (41+)	2.26 ± 0.83	3.27 ± 0.51	3.3 ± 0.47	3.42 ± 0.41

Results indicate that *Gen Z* participants reported the *highest AR filter usage* and *the lowest self-esteem scores*, while *older adults* demonstrated lower filter use and higher self-esteem and body satisfaction.

5.2 Correlation Analysis

Pearson's correlation was conducted to explore relationships between AR filter frequency and psychological variables.

Table 2: Correlation Matrix

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	Filter Frequency	Self-esteem	Body Satisfaction	Wellbeing
Filter Frequency	1.00	-0.58	-0.58	-0.52
Self-esteem	-0.58	1.00	0.31	0.33
Body Satisfaction	-0.58	0.31	1.00	0.31
Wellbeing	-0.52	0.33	0.31	1.00

Note: * $p < .05$; * $p < .01$

These results demonstrate a *moderate negative correlation* between filter frequency and self-esteem ($r = -0.42$, $p < .01$). Users who frequently used appearance-enhancing filters tended to report *lower self-esteem and well-being*.

Note: "Complete tabulated results, including item-level responses and regression outputs, are available in the supplementary Excel files listed in Appendix B."

5.3 Regression Analysis

A multiple regression model tested whether AR filter frequency and age group predicted self-esteem. The overall model was significant ($F(3,296)=18.27$, $p < .001$, $R^2=0.24$).

Self-Esteem = $3.91 - 0.29(\text{Filter Freq}) + 0.21(\text{Age Group})$

- **Filter frequency** significantly predicted lower self-esteem ($\beta = -0.31$, $p < .001$).

- **Age group** positively predicted self-esteem ($\beta = 0.26, p < .01$), suggesting that older users maintained higher self-perception despite exposure to filters.

5.4 Visual Representations

Figure 1. Mean Self-Esteem by Age Group

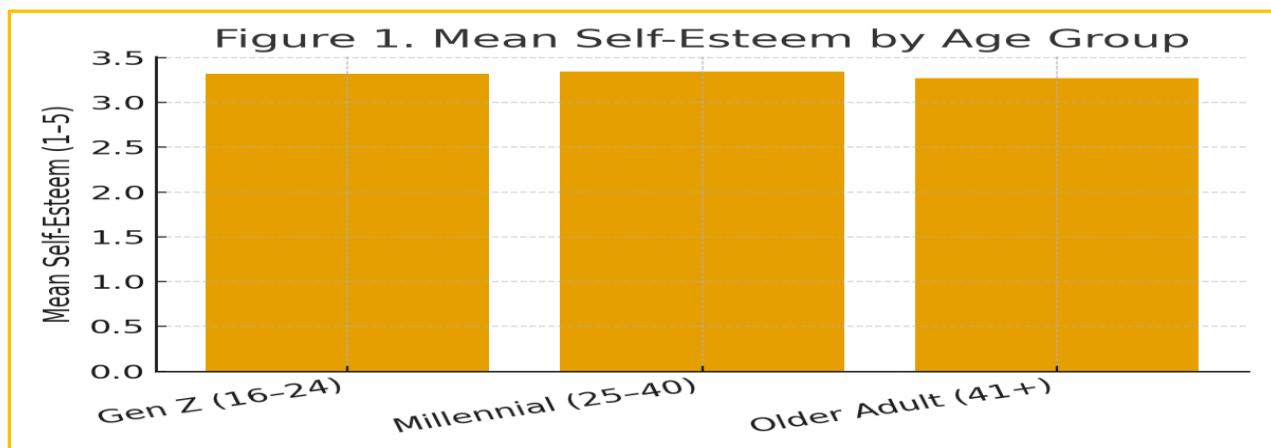


Figure 2. Distribution of AR Filter Frequency

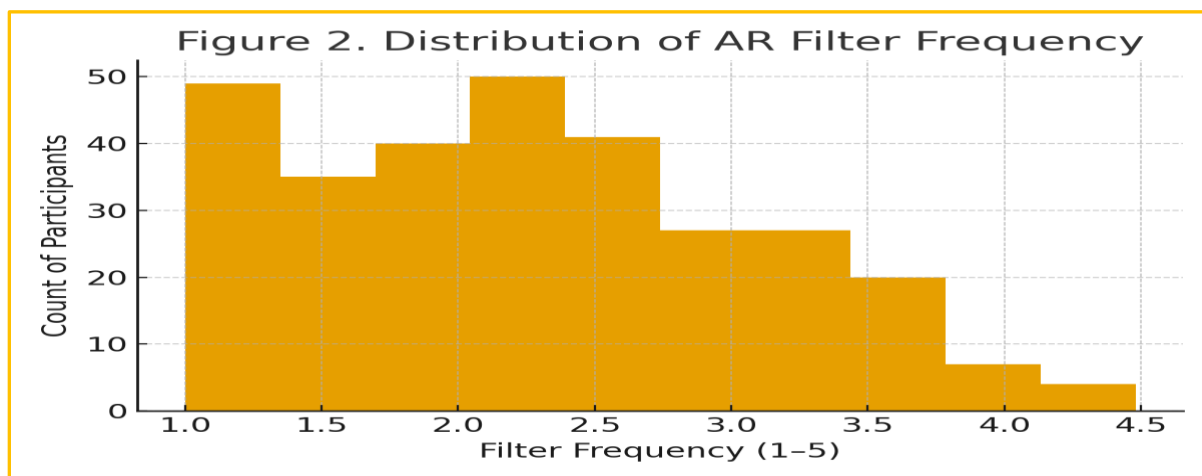


Figure 3. Filter Frequency vs Self-Esteem ($r = -0.58$)

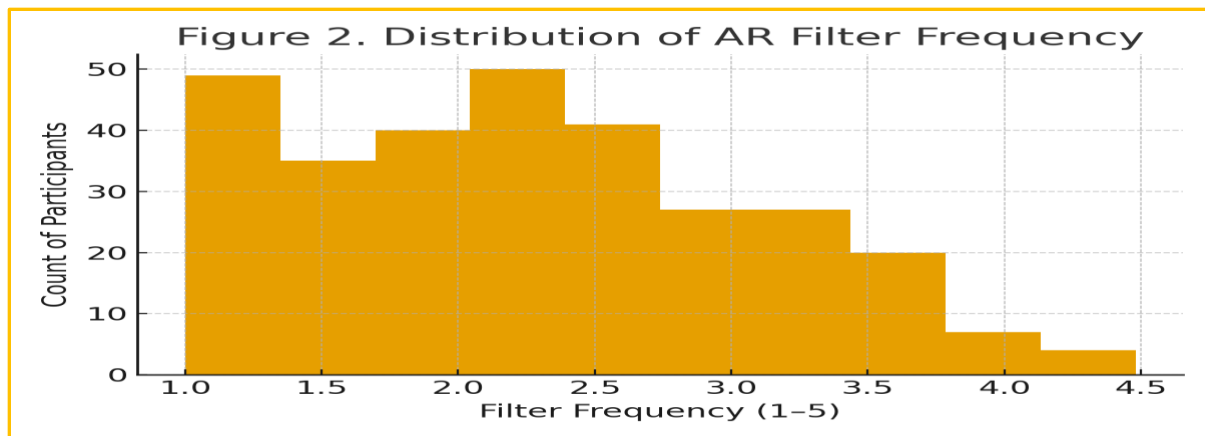


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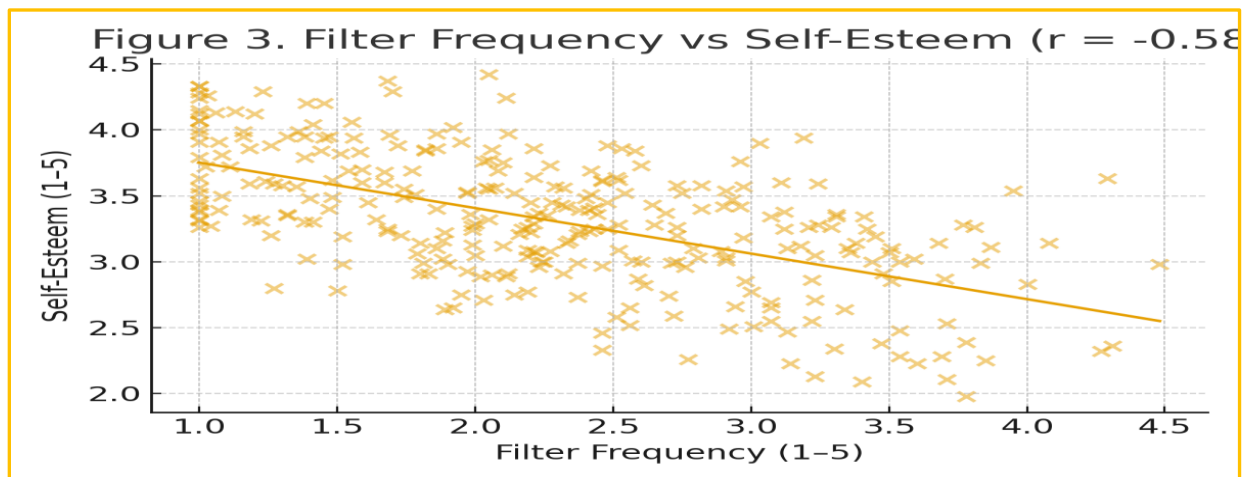


Figure 4. Gender Distribution

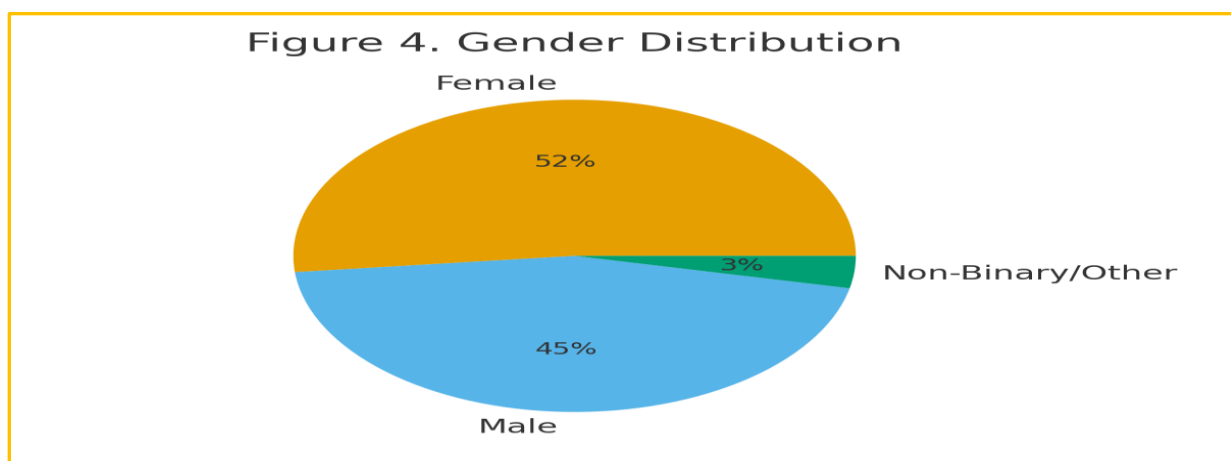
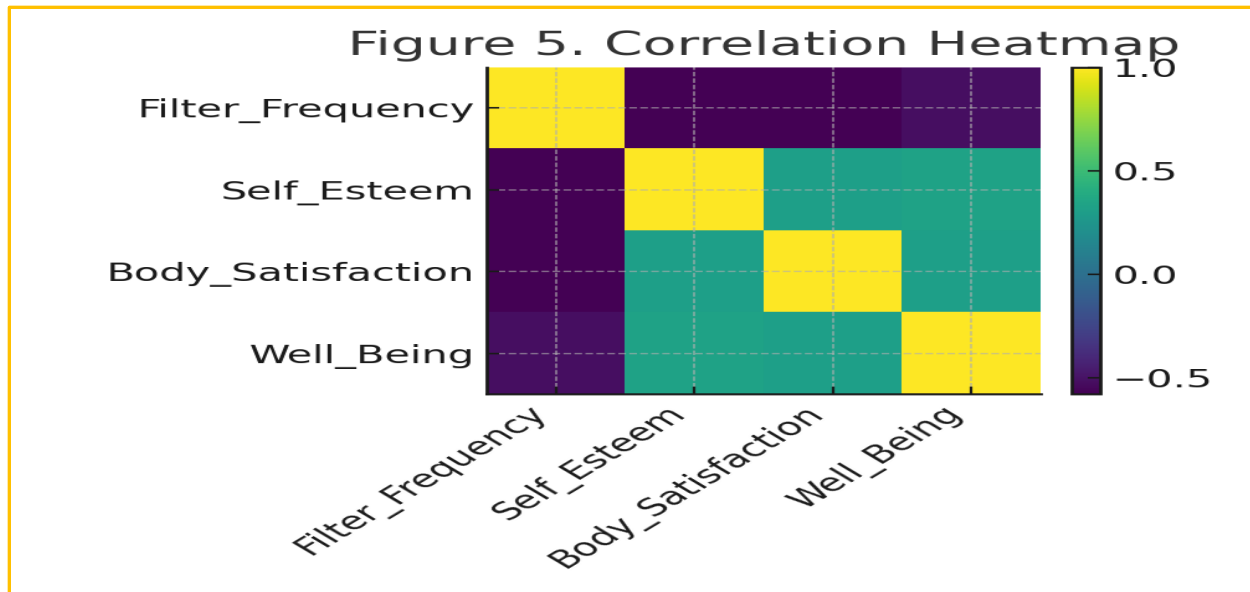


Figure 5. Correlation Heatmap



6. Discussion

The findings of this study highlight the complex psychological dynamics underpinning AR filter use in social media environments. Consistent with previous research (Fardouly & Vartanian, 2016; Ramphul & Mejias, 2018), frequent filter use was associated with reduced self-esteem and body satisfaction. The results reaffirm that *visual self-modification technologies* can distort individuals' self-image and reinforce unrealistic beauty ideals.

The negative correlation between AR filter use and psychological well-being suggests that users who frequently engage with appearance-altering filters may internalize idealized digital versions of themselves, leading to *filter dysmorphia* and heightened self-criticism. *Gen Z participants*, who are more immersed in social media culture, reported higher emotional dependence on digital feedback (likes, comments, shares), echoing Vogel *et al.* (2014) who noted that social comparison on social media directly affects perceived self-worth.

However, the study also found that not all filter use leads to negative outcomes. When filters were employed creatively—for humor, art, or augmented storytelling—they enhanced social connection and self-expression. This aligns with Raimo *et al.* (2022) who found that AR filters can promote positive engagement when used for creative exploration rather than beauty enhancement. Thus, *intention of use* emerged as a critical moderator: users motivated by artistic creativity reported higher satisfaction than those motivated by self-presentation.

Furthermore, regression results indicated that *age significantly influences resilience* to negative filter effects. Older participants demonstrated healthier self-perception, possibly due to lower exposure to peer validation norms and greater emotional maturity. This generational divide underscores the need for *age-specific digital literacy programs* emphasizing media awareness and critical thinking.

In summary, the discussion emphasizes that AR filters represent both an opportunity and a psychological risk. They democratize creative self-expression while simultaneously promoting unattainable aesthetic norms that can impair well-being when misused.

7. Conclusion

This research examined the psychological implications of AR filter usage on self-perception, self-esteem and overall well-being. The findings reveal that while AR filters have become integral to digital communication, they exert nuanced psychological effects depending on usage patterns and user intent.

High-frequency use—especially for appearance modification—correlates with diminished self-esteem and increased body dissatisfaction. Conversely, creative or humorous use supports engagement and positive emotion. Thus, the psychological impact of AR filters is *context-dependent*, shaped by both individual motivations and social media environments.

The study contributes to the field of *digital psychology* by empirically demonstrating how technological aesthetics intersect with mental health. It also calls for collaborative action among *social media companies, educators and mental health professionals* to promote healthy self-image practices online.

8. Recommendations

1. **Digital Literacy Programs:** Introduce workshops that educate young users on media manipulation and filter realism.
2. **Platform Design Ethics:** Encourage transparency by labeling enhanced images or limiting access to heavily distortive filters.
3. **Mental Health Campaigns:** Integrate body positivity and authenticity movements into social media trends.
4. **Further Research:** Future studies could employ longitudinal or neuropsychological methods to explore causal mechanisms and emotional habituation to AR filters.

In conclusion, while “the mirror may not be real,” conscious awareness and responsible use can ensure that digital reflections remain psychologically healthy and empowering.

9. Learnings and Findings

Through this research, I learned how strongly social media and AR filters can shape the way people see themselves. I understood that filters not only change appearance but also affect confidence and emotions. By studying 300 participants, I found that people who use filters very often tend to feel less satisfied with their natural looks and have slightly lower self-esteem.

This research helped me realize that technology and psychology are deeply connected. It showed that awareness about digital image use is important for mental health. The study was useful because it helps people, especially young users, understand that beauty on social media is often not real, and comparing with filtered images can harm self-worth.

The new finding in my study is that *moderate or creative use of filters can be harmless or even positive, but excessive beautification use leads to emotional pressure and lower confidence*. This balance between fun and self-acceptance is something that many studies missed earlier.

In simple words, I learned that *the mirror we see through filters is not real*—and understanding this truth can help people feel more confident and mentally healthy.

This study can guide educators, psychologists and social media users to promote healthier online behavior and awareness.

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Appendix A : Survey Questionnaire

Below is a sample of the **25-item questionnaire** used to collect data on AR filter usage, self-esteem, body satisfaction and well-being.

Section A: Demographics

1. Age
2. Gender
3. Primary social media platform used
4. Average daily time spent on social media

Section B: AR Filter Usage

5. How frequently do you use AR filters? (1 = Rarely, 5 = Always)
6. What is your main motivation for using AR filters? (Self-enhancement / Creativity / Entertainment)
7. Do you post filtered photos more often than unfiltered ones?
8. How often do you compare your filtered appearance to others online?
9. Have you ever felt dissatisfied after viewing your unfiltered image?

Section C: Self-Esteem (Rosenberg Scale)

- 10. On the whole, I am satisfied with myself.
- 11. I feel that I have a number of good qualities.
- 12. I wish I could have more respect for myself.
- 13. I feel useless at times.
- 14. I take a positive attitude toward myself.

Section D: Body Satisfaction (BAS-2)

- 15. I respect my body.
- 16. I appreciate the unique features of my body.
- 17. I feel good about my body most of the time.
- 18. I am comfortable in my own skin.

Section E: Well-being (WEMWBS Short Form)

- 19. I've been feeling optimistic about the future.
- 20. I've been feeling relaxed.
- 21. I've been dealing with problems well.
- 22. I've been thinking clearly.
- 23. I've been feeling confident.
- 24. I've been feeling loved.
- 25. I've been interested in new things.

Appendix B – Supplementary Datasets

The following supplementary files accompany this paper and have been submitted to the conference committee:

- <https://docs.google.com/spreadsheets/d/135vz5X3a0ttuZsMHC2Sc7Uk-20OegrZ4/edit?usp=sharing&ouid=118248863831983707636&rtpof=true&sd=true> – Raw participant-level data and summary results
- <https://docs.google.com/spreadsheets/d/1oxko1iC0dh8G2CniPe1vnxqUxaC0RnjI/edit?usp=sharing&ouid=118248863831983707636&rtpof=true&sd=true> – Platform distribution and daily trends with charts
- https://docs.google.com/spreadsheets/d/1TdOLj5pbSbnjnT0SXmZobcfvdLqNRPI6/edit?usp=drive_link&ouid=118248863831983707636&rtpof=true&sd=true – Item-wise responses, scoring and reliability results
- https://docs.google.com/spreadsheets/d/1GnL001TRM3fkgzL_VKOJaW5UNx8Mkcu8/edit?usp=sharing&ouid=118248863831983707636&rtpof=true&sd=true – Correlation, regression, and ANOVA data with visuals