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Unpacking Backlash: Social Costs of Gender Non-Conformity for Women and Men

Desirée Kozlowski[1] and Isabella Power[2]

ABSTRACT. Individuals deviating from gender-expected behavior experience negative social repercussions known as "backlash". Backlash is commonly exhibited as decreased ratings of likability and competence toward the gender-incongruent individual. Few researchers have compared gender-incongruent women and men within the same study, nor whether job-incongruence or trait-incongruence has a more potent effect on backlash. We aimed to determine whether and to what extent trait-incongruence and job-incongruence affected ratings of likability and competence for both female and male targets in an online experiment. Participants were 296 Australian adult volunteers (64% female; mean age = 35.87). Participants were presented with point-light walkers visually conveying the target's gender (female/male) together with a brief vignette describing the target's occupation (feminine vs. masculine) and personal trait (feminine vs masculine). Participants rated each target on likability and competence. We observed a classic backlash effect on likability and competence for trait-incongruent and job-incongruent female targets, with backlash greater for trait-incongruence than job-incongruence. In contrast, male targets exhibiting a stereotypically feminine trait elicited higher ratings on likability and competence than trait-congruent males: A *reverse* backlash effect. These findings could indicate a change in expectations and values; for example, they may reflect a negative response to the idea of "toxic masculinity".

Keywords: gender; backlash; gender roles; gender non-conformity; social consequences; masculinity

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Introduction

Sex and gender are related concepts often treated as having the same meaning despite being semantically separate constructs. We will use the word gender to refer to the ascription of femaleness or maleness to actors by observers and sex only where that term has been used in the literature. Upon initially perceiving an individual as a woman or a man, people tend to prescribe gendered characteristics to them based on their gender. For example, society assigns agentic traits – such as independence, assertiveness, self-confidence, and ambition – to men while believing that women should display communal characteristics such as friendliness, warmth, interpersonal sensitivity, and helpfulness (Eagly & Karau, 2002; Rosenfeld & Tomiyama, 2021). Such assumptions are known as prescriptive gender stereotypes, meaning that these behaviors are what society believes an individual *should* be like or do based on their perceived gender. Similarly, *Pro*scriptive gender stereotypes describe what an individual *should not* be like or do (Sullivan et al., 2018). For example, in Western societies, people generally believe that women should not be too agentic and men should not be too communal since such behaviors violate prescriptive gender roles (Bosson et al., 2022; Haines et al., 2016).

According to social role theory (Eagly, 1987), rather than arising from essentialist or evolutionary mechanisms, attitudes toward appropriate and inappropriate characteristics of men and women result from sex-differentiated behaviors, themselves shaped by the division of labor in a society. Gender roles are integral to every culture and are the most frequently activated social schema, even more so than age or race (Johnson & Ghavami, 2011). Furthermore, gender stereotypes influence how we behave as individuals, such as the partners we choose (Song & Liu, 2021), the jobs we decide to pursue, and the traits we choose to either express or repress (Löffler & Greitemeyer, 2021; Rudman & Glick, 2001).

Backlash

Individuals who violate prescriptive or proscriptive gender roles experience negative social consequences of their gender-incongruent behavior (Lee, 2022; Meeussen et al., 2022; Rudman & Glick, 2001; Rudman & Phelan, 2008). Rudman and Glick (2001) termed these social repercussions "backlash," and even gender-non-conforming preschool children are subject to it (Sullivan et al., 2018). Backlash is regarded as one of the mechanisms responsible for impeding women's career aspirations in terms of pursuing non-traditional careers and when seeking promotion (Flood et al., 2021; Smith et al., 2019) and for men's underrepresentation in jobs linked to communal roles (Meeussen et al., 2020).

Experimentally, backlash often manifests as decreased ratings of likability and competence toward the individual displaying the gender-incongruent behavior (Moss-Racusin et al., 2010; Rudman & Glick, 2001) and is a critical factor in coercing individuals to adhere to socially acceptable gender norms (Moss-Racusin & Rudman, 2010). Despite consistent evidence suggesting women experience backlash (e.g., Bosak et al., 2018; Phelan et al., 2008; Schneider et al., 2022), there are conflicting findings on backlash for non-conforming men. With few experiments comparing gender-incongruent women and men within the same study, it remains unknown whether the nature of backlash differs by gender. Moreover, while many studies confirm that both job-incongruence (Wilbourn & Kee, 2010) and trait-incongruence (Brosi et al., 2016; Parasurama & Sedoc, 2022) result in backlash for the protagonist, no researchers to date have examined both job and trait-incongruence within the same study. Thus, the discrete contributions of job- and trait-incongruence to the backlash effect are yet to be determined.

Despite gender perceptions shifting to reflect better the changing roles of women and men, prescriptive stereotypes over the last 30 years have remained mostly stable (Bosson et al., 2022; Haines et al., 2016). So, although women may increasingly be perceived as equally competent as men, competence is perceived as a less desirable trait for women to display than men (Anderson, 2018; Prentice & Carranza, 2002). This may explain why competent females are judged less likable than identical males (Rudman & Glick, 2001), a phenomenon consistent with the backlash effect.

Role Congruity Theory and the Status Incongruity Hypothesis

Researchers have sought to explain the backlash effect using established theories such as role congruity theory (RCT) (Eagly & Karau, 2002) and the status incongruity hypothesis (SIH) (Moss-Racusin et al., 2010; Rudman et al., 2012). RCT explains prejudice toward women leaders as arising from the conflict between what are regarded as typical characteristics of women and of leaders and suggests the further a particular leadership role is from the feminine gender role, the stronger this prejudice is likely to be (Eagly & Karau, 2002). SIH expands on RCT by identifying the beliefs implemented regarding gender stereotypes when backlash is evident (Rudman et al., 2012). According to the SIH, the belief systems driving backlash are that men should not be weak as weakness is associated with low status, while women should not be dominant because it is associated with high status (Rudman et al., 2012; Yildirim et al., 2019). This concept has been termed the “gender hierarchy,” and thus, agentic females experience backlash even when not in a leadership position (Ciancetta & Roch, 2021; Rudman & Fairchild, 2004).

A large body of literature examines the backlash effect that further supports the SIH using varying methodologies. For example, males can also experience backlash due to surrendering their status and assuming a lower

status role (Heilman, 2012; Rudman et al., 2012). Other female-proscribed behaviors besides taking a leadership position also result in backlash. For example, certain agentic traits – such as self-advocating behavior (Bosak et al., 2018), anger (Brescoll & Uhlmann, 2008), immodesty (Moss-Racusin & Rudman, 2010), and using sexuality to acquire power (Infanger et al., 2016) – result in backlash against females. Moreover, even when a managerial role was feminized, agentic women were rated less hireable than agentic males (Rudman & Glick, 2001).

Despite limited research on how backlash affects men, preliminary studies have indicated that when men violate gender roles through behaviors such as advocating for others (Bosak et al., 2018), or seeking help in the workplace (Rosette et al., 2015) they are perceived as deficient in agentic qualities, thus leading to lower ratings of competence. Other researchers found that men are disliked when they display modest behavior (Moss-Racusin et al., 2010) and that men are rated as more likely to be gay and less likable when they choose a feminized career path (Croft et al., 2015). While females experience both social and economic penalties for gender-incongruent behavior (Anderson, 2018; Moss-Racusin & Rudman, 2010), males have not been found to suffer economic penalties (Moss-Racusin et al., 2010; Moss-Racusin & Johnson, 2016). Instead of gender-incongruent behavior resulting in reduced liking as it does for women, men's incongruent behavior can result in reduced respect (Heilman & Wallen, 2010). These findings suggest that males are also subject to behavioral restrictions; however, *the way* men experience backlash is still not clearly established.

Jobs and Traits

The communal and agentic traits of women and men are often closely associated with certain jobs, resulting in gendered (feminine or masculine) professions, thereby creating a division in what is considered women's versus men's work (Levanon & Grusky, 2016; Manzi, 2019). In addition to job-incongruence resulting in backlash, research suggests that exhibiting gender-incongruent personal traits (trait-incongruence) can have similar consequences (Moss-Racusin et al., 2010; Rudman et al., 2012). It has been proposed that trait-incongruence challenges the gender hierarchy regardless of occupation, for example, when a woman displays agentic (high-status) traits (Rudman et al., 2012). However, what remains unknown is whether job-incongruence or trait-incongruence results in greater backlash for the individual. Researchers have speculated that, if trait-incongruent behavior results in backlash regardless of leadership position, trait-incongruence may have a more considerable influence on backlash than job-incongruence (Manzi, 2019; Rudman et al., 2012).

Most research on backlash has occurred in the context of occupational settings. It suggests that gender-incongruent behavior has implications for

individuals at every stage of their career: From the assessment of a résumé (Parasurama & Sedoc, 2022) and accuracy of performance ratings (Cardy & Dobbins, 1986) to salary negotiations and workplace promotions (Smith et al., 2019). Heilman et al. (2004) posited that it is not a candidate's competence per se but the rater's adverse social reaction that is the primary influence in workplace evaluations. Further, the nature of the job description itself can influence raters' assessments of both male and female applicants, and backlash against agentic female applicants is not universally found (see, for example, Steffens et al., 2009).

The Stereotype Content Model

Cuddy et al. (2009) proposed the stereotype content model (SCM) as a widely applicable inter-group relations account of social stereotypes based on two major universal factors: warmth and competence. Those authors found that observers do not necessarily rate out-group members in purely derogatory terms, but that ambiguous judgments – such as "rich" people being rated highly on competence and low on warmth – are common (Cuddy et al., 2009).

Thus, backlash need not manifest exclusively as reductions in regard across the board; more subtle effects are possible. Indeed, there is evidence that women are consistently rated as less likable when exhibiting overt (but not implicit) dominance but that their competence ratings are not affected (Williams & Tiedens, 2016). Meanwhile, rating male nurses as high on warmth was potentially linked to paternalistic attitudes toward them (Kaur et al., 2022). This makes the need for more nuanced research on the topic of backlash clear; in fact, it is necessary if we are to work toward an equal workplace environment for all genders.

The Present Study

Despite numerous studies on gender stereotypes and backlash there is still more to learn, particularly about the impact of backlash on men and the relative contributions of gender-incongruent traits and jobs. There is also a need for research comparing how women and men experience backlash within the same study, allowing for direct comparison. Thus, with this study we aimed to determine whether and to what extent gender-incongruent jobs and traits resulted in backlash for women and men. Our first aim was to examine whether backlash differed depending on whether gender incongruity was expressed through job or personal trait. Our second aim was to test whether backlash occurred differently for females and males displaying gender-incongruent jobs and traits. It was expected that females demonstrating masculine qualities would be perceived as less likable compared to gender-congruent females, but we had no directional hypothesis on competence. We

expected that males demonstrating feminine qualities would be perceived as less likable and less competent than gender-congruent males (Bosak et al., 2018).

Method

Participants

Participants were adults 18 years or older, recruited via emails to the university All-Students mailing list, social media, and snowball sampling. After eliminating outliers (see results section for details), 296 participants remained (190 [64%] female; 57 male; 2 non-binary; 3 prefer not to say; 3 prefer to self-describe; 41 no response; mean age = 35.87). Table 1 includes additional demographic information. The study was approved by the Southern Cross University Human Research Ethics Committee, approval number ECN-19-135. The experiment was conducted online at the convenience of the individual and took approximately 10 minutes to complete. Participants received relevant information about the experiment, and their consent was given by clicking the "next" button, which started the experiment.

Table 1 Demographic information from participants

Characteristic	**Information (%)**
Gender (n = 296)	Female: 64% Male: 19.3% Non-binary: 1.0% Prefer not to say: 1.5% Prefer to self-describe: 1.5% No response: 13.8%
Age (n = 240)	Mean age = 35.82 SD = 15.23 Range = 18–76 years old
Where do you currently live? (n = 256)	In a capital city: 21.8% In a regional city: 37.6% In a large town: 15.8% In a small town: 19.5% In a remote/outback area: 1.5%
Where did you grow up? (n = 255)	In a capital city: 28.2% In a regional city: 23.3% In a large town: 13.2% In a small town: 24.4% In a remote/outback area: 6.8%
Do you currently live in Australia? (n =266)	Yes: 85.7% No: 10.9%

Design

The study used a 2 x 2 incomplete repeated-measures design with the four conditions arising from manipulating trait (feminine/masculine) and job (feminine/masculine). Thus, the independent variables were job-type and personal trait. Female and male targets were considered separately so target gender was not an independent variable. The dependent variables were observers' ratings of each target's likability and competence.

An array of moving dots on the screen conveyed the gender of the target resulting in the percept either of a female or male walking figure. Such stimuli are known as point-light walkers (PLWs; see below for details). The same figure was displayed across all female target conditions and another across all male target conditions. These were paired with textual vignettes describing the target in terms of their occupation (job: feminine/masculine) and a personal characteristic (trait: feminine/masculine). Thus, on each presentation observers saw a moving image of a figure walking (conveying either male or female cues) presented with a written vignette containing information about the target's job and a personal trait, each of which either congruent or incongruent with the target's apparent gender.

Participants were randomly assigned to view one of four stimulus sets, each of which contained eight target presentations (four male targets and four female targets). There were four feminine and four masculine jobs and traits spread across the sets (see supplementary material for a full list of vignettes). Each participant encountered each job and trait only once to control for carryover effects. In this way, each participant encountered eight discrete targets presented in random order:

1. female target with a feminine job and feminine trait (fully congruent condition),
2. female target with a feminine job and masculine trait (trait incongruent condition),
3. female target with a masculine job and feminine trait (job incongruent condition),
4. female target with a masculine job and masculine trait (fully incongruent condition),
5. male target with a masculine job and masculine trait (fully congruent condition),
6. male target with a masculine job and feminine trait (trait incongruent condition),
7. male target with a feminine job and masculine trait (job incongruent condition),
8. male target with a feminine job and feminine trait (fully incongruent condition).

Participants were asked to rate each target on perceived likability and competence (dependent variables).

Visual stimuli. PLWs were arrays of 15 animated black dots on a white background. Together they convey gender through visual structure and motion cues (see Troje, 2002). The holistic presentation of dots and their trajectories indicate either female biological markers – such as wide hips, narrow shoulders and sway in their walk – or male biological markers including broad shoulders, narrow hips, with more swagger to the walk (Pollick et al., 2005). By using PLWs instead of images of real people, confounding variables, such as attractiveness, race, ethnicity, socio-economic status, eye color, hair color, and tertiary sex cues, are eliminated (Troje, 2002). This makes them a novel alternative to faces and names as a means of conveying gender.

PLWs are derived from a mathematical sampling of real people and range from -6 SD indicating extremely feminine, 0 indicating a gender-neutral PLW, and +6 SD indicating an extremely masculine PLW (Pollick et al., 2005; Troje, 2002). The PLW with a SD of -2 was used in the current study to represent a female protagonist and with a SD of +2 to represent a male. These stimuli are reported to be correctly identified in over 90% of cases (Kozlowski et al., 2016) but are not exaggerated in either structure or kinematics; thus, they represent a fairly 'average' male or female figure (Troje, 2002). The absolute size of the PLWs was responsive to screen resolution.

Vignettes. Vignettes provided short textual descriptions of each target PLW. Vignettes comprised a feminine or masculine gendered job (i.e., civil engineer, CEO, electrician, army, childcare worker, nurse, librarian, or secretary) and a feminine or masculine gendered trait (i.e., competitive, ambitious, confident, independent, modest, supportive, sensitive to the needs of others, or co-operative). Using vignettes allowed the presentation of a job (feminine/masculine) and trait (feminine/masculine) that were either congruent or incongruent with the target's gender. Each vignette was displayed directly below the animated PLW. For example: "I work as a civil engineer. I'd rather figure out my problems for myself than ask for help". Refer to the supplementary material to view the vignettes displayed for each condition.

According to Luzadis et al. (2008), prescriptive norms regarding job gender type are directly reflected by the statistical representation of gender within each job. The occupations chosen for the current study were based on actual participation rates as reported by the Australian Bureau of Statistics (2019). Our "feminine jobs" were those with a minimum of 85% female participation and our "masculine jobs" a minimum of 85% male participation. The statistical representation of those in the Australian army was not found on https://joboutlook.gov.au/Career; instead, data were obtained from the Aus-

tralian Government's 2015–2016 annual report (Department of Defence, 2016) of women in the Australian defence force.

In order to determine what constituted female and male prescribed traits, the stereotype trait indices developed by Bem (1974) and later reconfirmed by Prentice and Carranza (2002) were used. Those authors conducted a survey asking participants to rate how desirable it is for women and men to possess specific characteristics in U.S. society. It was found that male prescribed traits included confidence, strong leader, ambitious, independence, intelligence and competitiveness (α = .86). While female prescribed traits included co-operative, supportive, friendliness, warmth, and sensitive to the needs of others (α = .84) (Prentice & Carranza, 2002). This was the basis for choosing the gender prescriptive traits used in the current study. Refer to the supplementary material for a full list of the jobs and traits used in the study.

Measures

Likability and competence scale. Participants were required to rate each PLW on a single-item likability scale and a single-item competence scale. The competence scale was adapted from Heilman et al. (2004). The likability scale was adapted from Moss-Racusin et al. (2010). Participants were asked to rate "how competent do you find this person?" and "how likable do you find this person?" on a 7-point Likert scale (1= *not at all* to 7 = *extremely*). Single-item measures were deemed appropriate for this study as they provided parsimonious options to measure two quite well-defined constructs: competence and likability (Allen et al., 2022; Matthews et al., 2022).

Procedure

Participants were provided with a link to the online experiment, which was delivered using Survey Monkey. Once they clicked on the link, they were provided with an information sheet after which they selected "next" as implicit consent. At that point participants were randomly assigned to one of the four experimental conditions described earlier. Each target/vignette combination was displayed until the response was complete; participants then pressed a button to advance to the next target and so on until they had completed eight trials.

Results

Preliminary analyses

Initially, 301 participants responded to the online experiment. Data were assessed for outliers, and five participants with a z-score greater than +/-3.29

SDs were deleted from the data set. Analyses were conducted using IBM SPSS version 22. Missing data analysis revealed that 6.94% of responses were blank. Little's MCAR test was non-significant, indicating that data were missing completely at random. Thus, we retained data from 296 participants and allowed SPSS to exclude on an analysis by analysis basis. All measures and manipulations are disclosed in this manuscript. Observed power was ≥ .93 for all analyses and no data collection took place after data analysis.

Preliminary analysis using a 2 (participant gender) x 2 (target gender) mixed within-between analyses of variance (ANOVA) revealed that there were no significant differences between male and female participants on ratings of likability or competence. Therefore, data were collapsed across participant gender and the three participants who did not specify their gender were included in further analyses. The assumption of normality was met as indicated by histograms and Q-Q plots.

Experimental analyses

We ran separate 2 x 2 (trait [feminine, masculine] x job [feminine, masculine]) repeated measures ANOVAs for male and for female targets examining ratings of likability and competence (dependent variables) to determine whether displaying a gender incongruent trait and/or job affected observers' ratings. Thus, we report the results of four ANOVAs:
1) likability ratings for female targets,
2) competence ratings for female targets,
3) likability ratings for male targets, and
4) competence ratings for male targets.

Female likability

Figure 1 shows the mean ratings of likeability for female targets. Overall, female targets with feminine traits were rated more likeable than female targets with male traits, as indicated by a significant main effect of trait (F (1, 272) = 289.71, $p < .001$, $\eta^2 = .516$). There was also a significant main effect of job (F (1, 272) = 16.94, $p < .001$, $\eta^2 = .059$), indicating that targets with feminine jobs were perceived to be more likeable overall. These effects were moderated by a significant job*trait interaction (F (1, 272) = 14.20, $p < .001$, $\eta^2 = .050$). Figure 1 shows that, for those targets with masculine traits, there was no difference between ratings based on masculine or feminine job. However, for targets with feminine traits likeability was rated more highly for those with feminine jobs (i.e., those that were fully congruent).

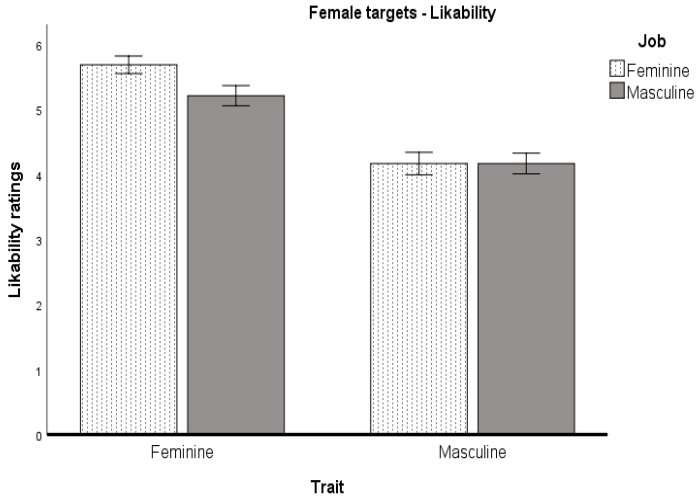


Figure 1 Mean likability ratings for female targets according to job and trait congruence. Error bars = 95% confidence intervals.

Female competence

Figure 2 shows the mean ratings of competence for female targets. Although the magnitude of the effect was not as pronounced as that seen for likeability, female targets with feminine traits were rated more competent than those with male traits. This was confirmed by a significant main effect of trait (F (1, 272) = 134.60, $p < .001$, $\eta^2 = .331$). There was also a significant main effect of job (F (1, 272) = 5.24, $p < .023$, $\eta^2 = .019$), indicating that targets with feminine jobs were perceived to be more competent. These effects were moderated by a significant job*trait interaction (F (1, 272) = 28.80, $p < .001$, $\eta^2 = .096$). As illustrated in Figure 2, for targets with a feminine job, competence was rated more highly for those possessing a feminine trait. However, for targets with a masculine job, competence was rated more highly for those possessing a masculine trait.



Figure 2 Mean competence ratings for female targets according to job and trait congruence. Error bars = 95% confidence intervals.

Male likability

Figure 3 shows the mean ratings of likability for male targets. Observers perceived male targets with a feminine (i.e., gender incongruent) trait to be more likable than those with a masculine trait, as indicated by a significant main effect of trait (F (1, 271) = 320.85, $p < .001$, $\eta^2 = .542$). There was no main effect of job or job*trait interaction (both $p > .05$). Thus, males with a feminine trait were rated as significantly more likable than males with a masculine trait and job-congruence had no effect on likability.

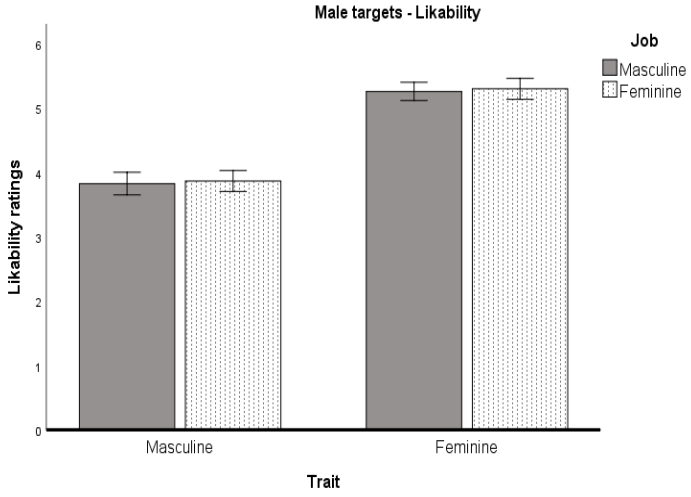


Figure 3 Mean likability ratings for male targets according to job and trait congruence. Error bars = 95% confidence intervals.

Male competence

Figure 4 shows the mean ratings of competence for male targets. Overall, male targets with feminine traits were rated more competent than male targets with masculine traits, as confirmed by a significant main effect of trait (F (1, 270) = 87.61, $p < .001$, $\eta^2 = .245$). There was also a significant main effect of job (F (1, 270) = 12.16, $p = .001$, $\eta^2 = .043$), indicating that targets with masculine jobs were rated as more competent overall. There was no job*trait interaction ($p > .05$).



Figure 4 Mean competence ratings for male targets according to job and trait congruence. Error bars = 95% confidence intervals.

Discussion

Backlash is the reduction in ratings of liking and competence toward an individual who diverges from what is expected based on their apparent gender. Exploring the nature of backlash is important for understanding social biases and working toward gender parity. We aimed to investigate whether backlash differed when gender-incongruence was expressed through job or personal trait and whether it manifested differently for females and males. We found that job- and trait-incongruence affected backlash differently. Overall, trait-incongruence had a greater backlash effect than job-incongruence for both females and males. We also found that the overall nature of backlash differed for women and men. Female targets exhibiting either job- or trait-incongruent behavior were rated as less likable and less competent than those where job and trait were feminine (congruent): A classic backlash effect. However, male targets exhibiting a feminine (incongruent) trait were rated as both more likeable and more competent than gender conforming males: A *reverse* backlash effect. Job-incongruence did not affect ratings of likability for the male targets, but resulted in lower perceived competence.

We hypothesised that females displaying gender-incongruent behavior would be rated less likable than gender-congruent females, and that males exhibiting feminine qualities would be perceived as less likable and less competent than gender-congruent males. The hypothesis was supported for female targets: Gender-incongruent females were viewed as less likable and competent. For male targets though, our results were opposite to those we expected to see, with trait-incongruent males perceived as *more* likable and competent than gender-conforming males.

In terms of the relative contributions of job- and trait-incongruence we found that trait-incongruence had more potent consequences than job-incongruence for both genders. Female targets were rated as less likable when they held a masculine job, but exhibiting a masculine personal trait, such as independence, came at significantly higher social cost. The pattern was similar for ratings of competence, and possessing a masculine trait resulted in greater backlash for female targets with a feminine job than for those in a masculine one.

Similar Patterns for Likability and Competence

Our finding that competence ratings mirrored likability ratings was not predicted. As expected, trait- and job-incongruent females were perceived as less likable; however, they were also perceived as less competent. The finding on competence is contrary to previous work, which suggested masculine traits were associated with higher competence ratings regardless of one's gender (Rosette et al., 2015). Accordingly, gender-incongruent women have been perceived as more competent than congruent women (Brescoll & Uhlmann, 2008) and gender-incongruent men as less competent than congruent men (Rosette et al., 2015). It is possible that the social construction linking masculinity with competence is changing over time (Chan et al., 2021; Gartzia & van Engen, 2012). This may be in response to increasing awareness of concepts like "toxic masculinity", where men's social dominance is based on masculine norms such as violence and devaluing women (Elliott, 2018); the glass elevator, which refers to the apparent ease with which men advance in female-dominated careers; and/or, the "me too" movement, where victims of sexual harassment, particularly by prominent men, speak out (Scher, 2018). We have known for some time that when an individual evaluates another's workplace performance, their rating often better reflects the extent to which they find the other to be likable than the protagonist's actual competence (Cardy & Dobbins, 1986). It may be that we no longer perceive masculine characteristics to be direct reflections of competence and are beginning to perceive some more feminine traits as linked to competence.

The outcomes for our female targets can be considered consistent with suggestions by Rudman et al. (2012) that agentic female behavior may result

in backlash whether or not the woman holds a leadership position because trait-incongruence challenges society's gender hierarchy. Those authors proposed that *status*-incongruence might have a more substantial influence on backlash than job-incongruence per se. Here we have seen that not only does backlash occur irrespective of occupation, but trait-incongruence was a more potent driver of backlash than job-incongruence. Since most studies on backlash have explored such concepts within the framework of occupational settings (Berkery et al., 2013; Elman et al., 2018; Rosette et al., 2015), our study contributes to this body of work by examining backlash in a more general context.

Reverse Backlash for Men

We also found the consequences of gender non-conformity were different for men and women. We found a *reverse* backlash effect (higher ratings of likability and competence) observed for trait-incongruent males. Sekaquaptewa and Espinoza (2004) reported that members of a high-status group can display gender-incongruent behavior without biases being activated. Thus, for example, it could be that job-incongruence had no effect on likability for male targets in the current study due to the implicit high-status of men. However, Sekaquaptewa and Espinoza's (2004) findings fall short of explaining the reverse backlash effect we found for trait-incongruent men. Perhaps we simply do not like women to deviate from their assigned roles but find it more acceptable for males to do so. Again though, there is little support for this idea in the literature where backlash has been demonstrated to occur also for men (Heilman & Chen, 2005; Moss-Racusin, 2014; Moss-Racusin & Johnson, 2016). In fact, it has been suggested that men experience greater social backlash than women due to the stronger gender proscriptions placed on men (Bosson et al., 2022; Kozlowski et al., 2016; Vandello & Bosson, 2013).

The significantly lower competence ratings of gender-congruent male targets compared to those exhibiting a feminine trait was perhaps the most interesting finding in the current study. One possibility is that we are seeing experimental evidence of an emergent kind of social cost: A backlash against hyper-masculinity. Terms such as "hegemonic masculinity" or "toxic masculinity" are used to describe men who are somehow more masculine than is ideal (de Boise, 2019) and this type of narrative is gaining traction. Perhaps these ideas have contributed to a preference for both genders to display communal traits rather than agentic traits (Quayle et al., 2018). A man with some softening aspect to him may now be regarded as a "better" man (Gallegos et al., 2019). Elman et al. (2018) studied workers' perceptions of female and male managers exhibiting either communal or agentic traits. They found that workers preferred managers who exhibited communal traits – irrespective of the manager's gender. This accords with our participants' higher liking for feminine traits in both females and males. However, in the Elman et al. (2018)

study, workers rated communal managers lower on competence, where we saw no such dip. If attitudes were shifting and we were beginning to hold feminine traits in higher regard and perceive them as reflecting higher competence and likability, we would expect to see a pattern such as we found here, traditional backlash for females and a reverse backlash for males.

Alternatively, this reverse backlash toward trait-incongruent males on competence may reflect an increasing emphasis on "softer" skills in the workplace (Coda et al., 2021; Gartzia & van Engen, 2012). Some of these softer skills – such as collaboration, co-operation, openness and empathy – have traditionally been regarded as feminine traits (Kark et al., 2012). With these skills becoming increasingly valued in the workplace, they may also be increasingly associated with competence regardless of the gender of those exhibiting them. Indeed, Opfer (2018) found that when assessing the likability and competence of the sender of a business email, readers rated those exhibiting communal (feminine) traits higher on both measures than senders exhibiting agentic (masculine) traits. Opfer's (2018) result was consistent across genders, a fact consistent with our finding that both males and females were rated more highly when exhibiting feminine traits.

The Current Findings in Context

Many studies investigating backlash have a theoretical foundation in the status incongruity hypothesis (SIH) (Moss-Racusin et al., 2010; Moss-Racusin & Johnson, 2016). Our finding that gender-incongruent women experienced backlash was consistent with SIH, whereas the reverse backlash for gender-incongruent men was not. As mentioned, this may be related to changing perceptions of women and men over-time, or to a growing focus on the importance of soft skills, but it could also be explained by the motivations of women and men. For example, Johnston and Diekman (2015) proposed an alternative explanation for the backlash effect. They found women are perceived to be ideally-motivated (i.e., motivated by what they aspire to be) while men are equally motivated by their ideals but also what they "ought" to do (obligation). Thus, when a woman expresses that she is acting out of obligation rather than desire, she can experience backlash from others due to violating the gender norm associated with women being ideally-motivated (Johnston & Diekman, 2015). Those authors suggested that this double-edged sword is also evident in the workforce, whereby society assumes a woman displaying agentic traits in her occupation is doing so out of aspiration rather than it being a requirement of her working role (Johnston & Diekman, 2015). As men are more often perceived to act out of obligation rather than desire, the backlash for non-conforming is milder.

The fact that the male targets displaying trait-incongruent behavior in our study were perceived as more likable and more competent could be because their deviation – toward being emotionally sensitive, or nurturing, for

example – was perceived as arising from being motivated by "what they should do". If they were perceived to be partaking in behaviors outside the gendered social roles of men because it was what they *ought* to do rather than what they aspired to do, this may be enough for them to be rewarded with higher ratings on likability and competence. Equally, if the female targets who deviated were perceived to be doing so out of aspiration rather than obligation, they may have been judged as deserving social punishment. Based on Johnston and Diekman's (2015) study, and our own results, we suggest that perceived motivation may have implications for backlash and that this is a promising area for future research.

The current study employed a novel methodology, which allowed us to control all variables except those of experimental interest. Its merits for examining social attitudes and testing for experimental effects of manipulating individual attributes are confirmed by the nuanced results evident here. The contribution of these results to theory must rest on further research to replicate and confirm (or disconfirm) that men exhibiting stereotypically feminine traits are in fact rated as more likeable and competent. From there, investigations into why that might be so will be needed. An example of work in this direction is Chan et al.'s study (2021) that linked lower competence ratings of more overtly masculine politicians to the voting record of those politicians. The initial question will be whether our reverse backlash results from a rejection of overt masculinity or that stereotypically feminine traits are becoming more highly valued per se. The answer to this question will come with considerable practical implications, including to education and training.

It must be noted that our study was not without its limitations. Firstly, we measured backlash only in terms of observers' ratings of likability and competence. Previous research has indicated that additional forms of backlash can be evident – especially for gender-incongruent men – such as being perceived as gay (Croft et al., 2015) or being disrespected (Heilman & Wallen, 2010). Future work could focus on including a broader range of constructs to measure backlash within the same study. We found a reverse backlash for trait-incongruent men on likability and competence, but other social consequences may not reflect the same pattern.

An additional factor is that the participants in this study were predominately university students. Therefore, our results may represent the attitudes of a particular subset of people – Australians with a university education – rather than Australian attitudes more generally. However, there is some evidence the roles of women and men in society are changing (Bosak et al., 2018), and it is plausible that our research reflects a real generational shift in Australian attitudes towards women and men and how they are evaluated. Of course, follow-up studies will be necessary to confirm this.

Conclusion

Our results indicate that traditional backlash is still experienced by gender-incongruent women in Australian society, with the social cost of trait-incongruence greater than that of job-incongruence. In comparison, male targets were appraised as more likeable and more competent when they exhibited a gender-incongruent personal trait: A *reverse* backlash effect. This may be experimental evidence of changes in society's perception of women and men. Possible explanations for this are: increasing unease with hyper-masculinity arising from coverage of social issues like the "me too" movement and toxic masculinity; growing awareness of the value of soft-skills, which largely align with feminine traits; or the perception that gender-incongruent women are motivated by aspiration (and thus deserve punishment), while gender-incongruent men deviate out of obligation (which "excuses" them from culpability for their transgression).

The contribution of our study to the literature is the direct comparison of the social costs of gender-incongruence for female and male targets. Also, we have illustrated the relative contributions of trait- and occupation-incongruence to backlash. This provides a more nuanced and realistic understanding of the nature of backlash for both genders and outlines the circumstances in which backlash is likely to be most evident. Furthermore, this research flags an effect not reported previously that may represent the first empirical evidence of a shift in attitudes toward hyper-masculinity. Although replication and further exploration will be required for an unambiguous interpretation, this novel finding provides a sound basis for further investigation.

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The authors affirm that the manuscript represents an honest, accurate, and transparent account of the research being reported, that no relevant aspects of the study have been left out, and that any inconsistencies from the research as planned (and, if significant, registered) have been clarified.

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Beauty Filters for Physical Attractiveness: Idealized Appearance and Imagery, Visual Content and Representations, and Negative Behaviors and Sentiments

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ABSTRACT. This paper provides a systematic literature review of studies investigating image and body beautification tools and deep learning-based facial retouching in relation to digitally networked images. The analysis highlights that photo editing and beauty apps configure unrealistically ideal body images in terms of normative standards. Throughout April 2022, we performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "beauty filters for physical attractiveness" + "idealized appearance and imagery," "visual content and representations," and "negative behaviors and sentiments." As we inspected research published between 2017 and 2022, only 168 articles satisfied the eligibility criteria. By eliminating controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, we decided upon 24, generally empirical, sources. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Distiller SR, MMAT, and ROBIS.

Keywords: beauty filter; physical attractiveness: idealized appearance and imagery; visual content and representation; negative behavior and sentiment

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1. Introduction

Digital self-representation, visually discursive practices, and social meaning and engagement optimize beauty norms and standards in relation to idealized body images. The purpose of our systematic review is to examine the recently published literature on idealized appearance and imagery, visual content and representations, and negative behaviors and sentiments and integrate the insights it configures on beauty filters for physical attractiveness. By analyzing the most recent (2017–2022) and significant (Web of Science, Scopus, and ProQuest) sources, our paper has attempted to prove that low self-esteem, digitized social interactions, and perceived facial and body imperfections can be attained through augmented reality beauty apps. The actuality and novelty of this study are articulated by addressing image and body beautification tools and deep learning-based facial retouching in relation to digitally networked images (Andronie et al., 2023; Lăzăroiu et al., 2022; Nagy and Lăzăroiu, 2022), that is an emerging topic involving much interest. Our research problem is whether augmented reality and depth sensing algorithms (Andronie et al., 2021; Lăzăroiu et al., 2017) assist digital self-representational media in relation to visual and digital practices and negative emotions and feelings.

In this review, prior findings have been cumulated indicating that emotional and aesthetic identities in relation to negative self-esteem and body dissatisfaction require visual content, symbolic meanings, impression management, and social adaptation. The identified gaps advance edited and retouched images necessitating photo beautification apps. Our main objective is to indicate that photo editing and beauty apps configure unrealistically ideal body images in terms of normative standards. This systematic review contributes to the literature on socially constructed attractiveness and appealing self-presentation by clarifying that beauty ideal internalization and standards are attained through multimodal emotional expressions and visual inconsistencies. This research endeavors to elucidate whether beauty apps and edited physical appearance further normative beauty standards, idealized body image, and visual connections on social media. Our contribution is by integrating research findings indicating that negative beliefs, thoughts, and feelings, societal expectations, and visual and discursive data can be achieved through try-on surgery filters.

2. Theoretical Overview of the Main Concepts

Digital beauty technologies enable idealized body representations, aesthetic and emotional visuality, and image sentiment recognition. Augmented reality try-ons and beauty apps integrate affective and cognitive behaviors, experiences, and feelings in terms of negative body image and emotions. Motion sensing technology is instrumental in social comparisons, realistically un-

attainable beauty standards, and negative body image and self-esteem. Impression and appearance management can optimize low self-esteem in relation to physically attractive individuals and public self-consciousness. Online social contexts, self-rated emotional expressiveness, and cultural norms and codes shape decision-making and behavior as regards beauty filters. The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), normative beauty standards, idealized body image, and visual connections on social media (section 4), image and body beautification tools and deep learning-based facial retouching (section 5), digitally modified bodies and visible selves (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout April 2022, we performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "beauty filters for physical attractiveness" + "idealized appearance and imagery," "visual content and representations," and "negative behaviors and sentiments." As we inspected research published between 2017 and 2022, only 168 articles satisfied the eligibility criteria. By eliminating controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, we decided upon 24, generally empirical, sources (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Distiller SR, MMAT, and ROBIS (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
beauty filters for physical attractiveness + idealized appearance and imagery	56	8
beauty filters for physical attractiveness + visual content and representations	55	8
beauty filters for physical attractiveness + negative behaviors and sentiments	57	8
Type of paper		
Original research	153	22
Review	7	2
Conference proceedings	6	0
Book	1	0
Editorial	1	0

Source: Processed by the authors. Some topics overlap.

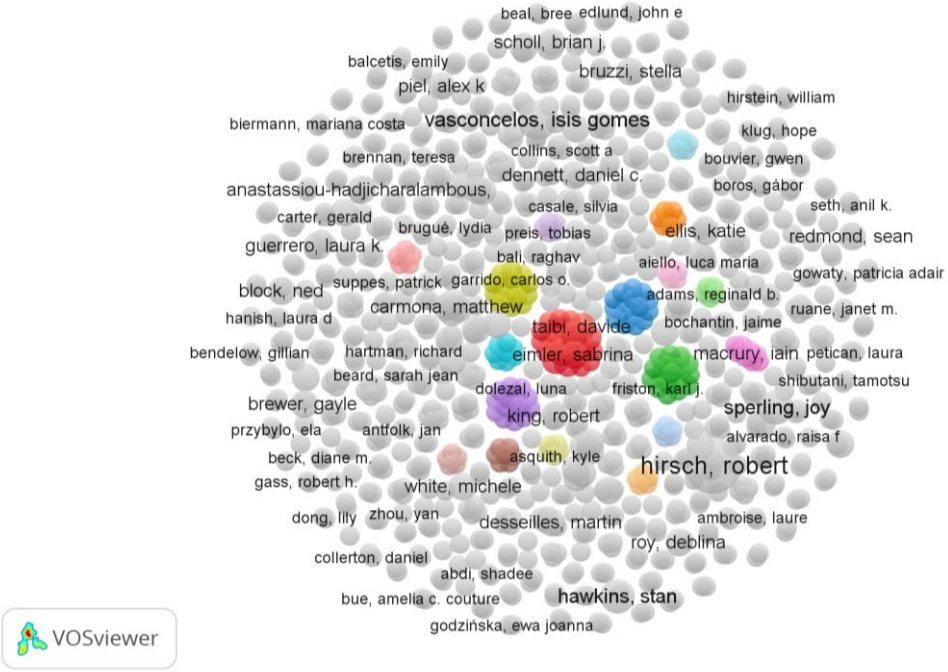


Figure 1 Co-authorship

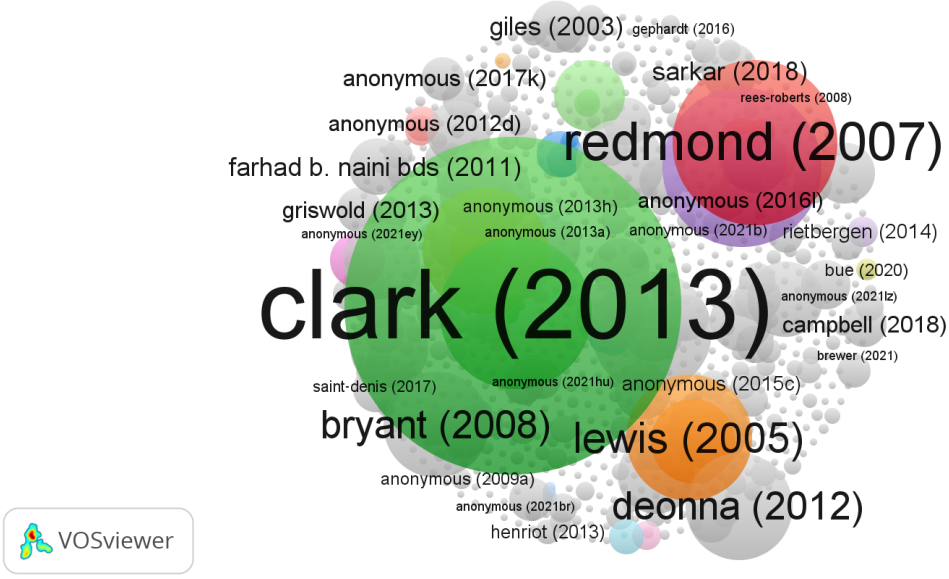


Figure 2 Citation

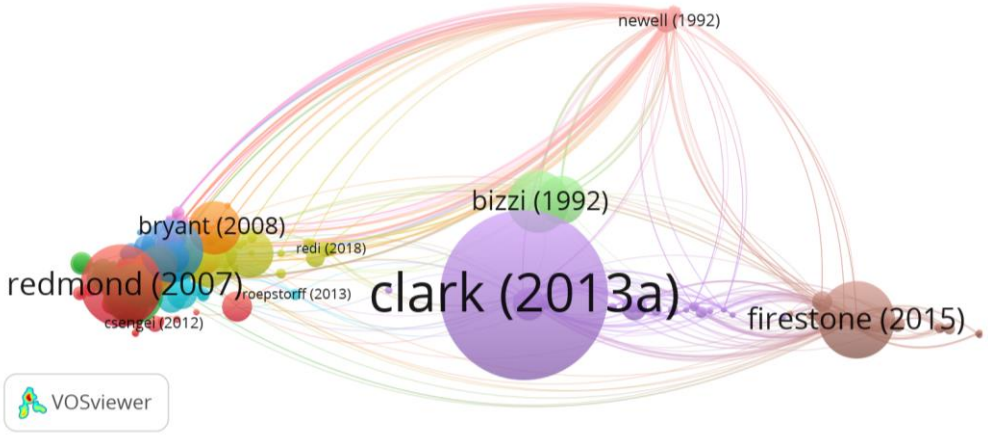


Figure 3 Bibliographic coupling

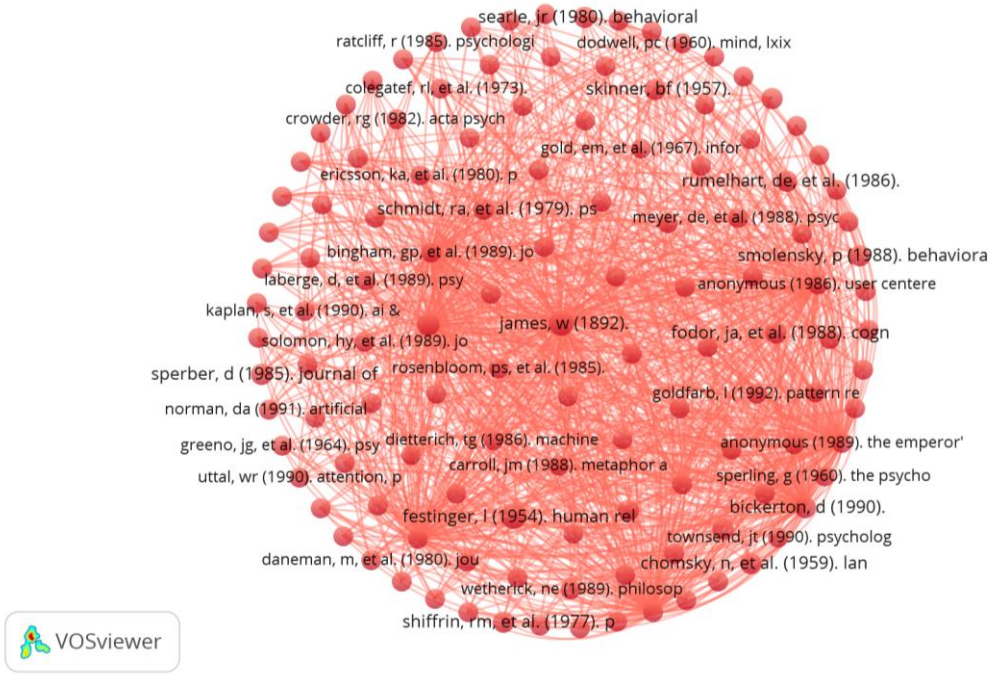


Figure 4 Co-citation

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings).

Negative self-esteem, visual representations, and digital self-monitoring and self-tracking assist beauty apps and photo editing tools.	Butkowski et al., 2022; Elias and Gill, 2017; Lavrence and Cambre, 2020; Millière, 2022; Rodner et al., 2022
Beauty apps and aesthetic digital self-tracking and self-monitoring devices enable self-modifying practices in relation to idealized facial and bodily appearances.	Eriksson and Kenalemang, 2023; Frieiro et al., 2022; McGill, 2022; Yang, 2022
Socio-cultural dynamics, contexts, and processes can be attained through biometric data and face beautification tools.	Elias and Gill, 2017; Lavoye et al., 2023; Peng and Gu, 2021; Wang, 2020; Zhao and Zappavigna, 2018
Social interactions, facial and bodily expressions, low self-perception and self-esteem, and negative behaviors and attitudes articulate socially constructed attractiveness and appealing self-presentation.	Eriksson and Kenalemang, 2023; Evans, 2023; Frieiro et al., 2022; Morikawa et al., 2021; Yang, 2022
Augmented reality beauty apps and facial recognition algorithms further virtual body representation, thoughts and feelings, symbolic meanings, cognitive and behavioral control, and visual and haptic imagery.	Evans, 2023; Jarzyna, 2021; Lavoye et al., 2023; Whang et al., 2021; Zhang, 2022; Zhao and Zappavigna, 2018
Image and body beautification tools and deep learning-based facial retouching in relation to digitally networked images configure social desirability, specific personal traits and behaviors, and socially constituted norms.	Degen and Kleeberg-Niepage, 2023; Eriksson and Kenalemang, 2023; Jarzyna, 2021; Lavoye et al., 2023; McGill, 2022
Computer vision and digital image enhancement algorithms articulate selfie-taking behaviors, personality traits, and narcissistic self-representation.	Millière, 2022; Morikawa et al., 2021; Ponseti et al., 2022; Wang and Yu, 2023; Zhao and Zappavigna, 2018
Edited and retouched images necessitate photo beautification apps in relation to idealized appearance and attractiveness and emotional well-being.	Evans, 2023; Qutub, 2021; Skov and Nadal, 2021; Zhang, 2022; Zhao and Zappavigna, 2018
Intersecting social identities, modified bodily features, and inauthentic social performance develop on deep learning-based photorealistic and retouched images and beauty filters.	Frieiro et al., 2022; McGill, 2022; Millière, 2022; Rodner et al., 2022; Sonmez and Esiyok, 2022; Yang, 2022

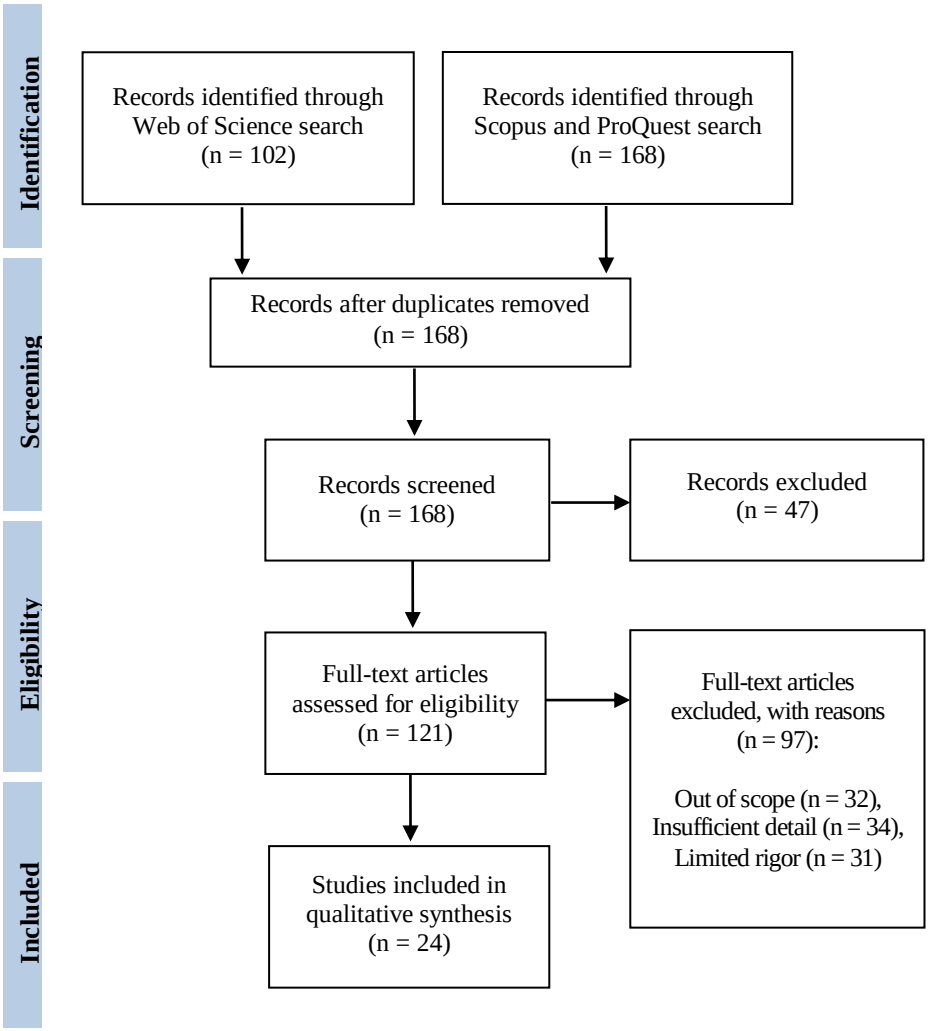


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

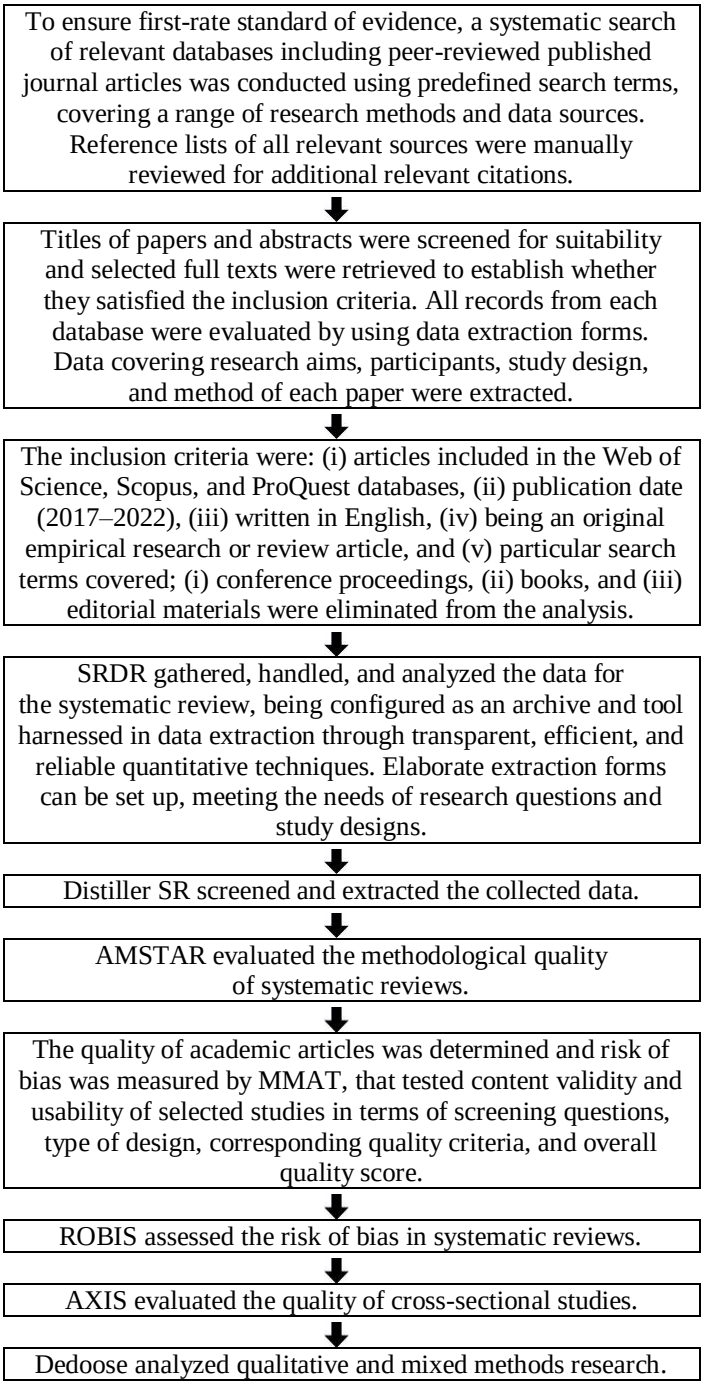


Figure 6 Screening and quality assessment tools

4. Normative Beauty Standards, Idealized Body Image, and Visual Connections on Social Media

Negative self-esteem, visual representations, and digital self-monitoring and self-tracking (Butkowski et al., 2022; Elias and Gill, 2017; Lavrence and Cambre, 2020; Millière, 2022; Rodner et al., 2022) assist beauty apps and photo editing tools. Digital self-presentation and sociality integrate semantic face editing tools, networked social practices, synthetic visual media, and generative adversarial networks. Low self-esteem, digitised social interactions, and perceived facial and body imperfections can be attained through augmented reality beauty apps. Negative beliefs, thoughts, and feelings, societal expectations, and visual and discursive data can be achieved through try-on surgery filters.

Beauty apps and aesthetic digital self-tracking and self-monitoring devices (Eriksson and Kenalemang, 2023; Frieiro et al., 2022; McGill, 2022; Yang, 2022) enable self-modifying practices in relation to idealized facial and bodily appearances. Emotional and aesthetic identities in relation to negative self-esteem and body dissatisfaction require visual content, symbolic meanings, impression management, and social adaptation. Beauty apps and edited physical appearance further normative beauty standards, idealized body image, and visual connections on social media. Self-editing software and visual data mining tools in relation to conventionally attractive individuals enable normative beauty ideals, body dissatisfaction.

Socio-cultural dynamics, contexts, and processes (Elias and Gill, 2017; Lavoye et al., 2023; Peng and Gu, 2021; Wang, 2020; Zhao and Zappavigna, 2018) can be attained through biometric data and face beautification tools. Algorithmic sociality, visual data, and social processes necessitate facial recognition systems as regards ideal or normative body images and virtual makeovers. Augmented reality try-ons and beauty apps integrate affective and cognitive behaviors, experiences, and feelings in terms of negative body image and emotions. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Negative self-esteem, visual representations, and digital self-monitoring and self-tracking assist beauty apps and photo editing tools.	Butkowski et al., 2022; Elias and Gill, 2017; Lavrence and Cambre, 2020; Millière, 2022; Rodner et al., 2022
Beauty apps and aesthetic digital self-tracking and self-monitoring devices enable self-modifying practices in relation to idealized facial and bodily appearances.	Eriksson and Kenalemang, 2023; Frieiro et al., 2022; McGill, 2022; Yang, 2022
Socio-cultural dynamics, contexts, and processes can be attained through biometric data and face beautification tools.	Elias and Gill, 2017; Lavoye et al., 2023; Peng and Gu, 2021; Wang, 2020; Zhao and Zappavigna, 2018

5. Image and Body Beautification Tools and Deep Learning-based Facial Retouching

Social interactions, facial and bodily expressions, low self-perception and self-esteem, and negative behaviors and attitudes (Eriksson and Kenalemang, 2023; Evans, 2023; Frieiro et al., 2022; Morikawa et al., 2021; Yang, 2022) articulate socially constructed attractiveness and appealing self-presentation. Virtual makeover apps are pivotal in self-image alteration, body image and facial appearance dissatisfaction, and bodily and facial appearances. Augmented reality and depth sensing algorithms assist digital self-representational media in relation to visual and digital practices and negative emotions and feelings.

Augmented reality beauty apps and facial recognition algorithms (Evans, 2023; Jarzyna, 2021; Lavoye et al., 2023; Whang et al., 2021; Zhang, 2022; Zhao and Zappavigna, 2018) further virtual body representation, thoughts and feelings, symbolic meanings, cognitive and behavioral control, and visual and haptic imagery. Motion sensing technology is instrumental in social comparisons, realistically unattainable beauty standards, and negative body image and self-esteem. Photo editing and beauty apps configure unrealistically ideal body images in terms of normative standards.

Image and body beautification tools and deep learning-based facial retouching in relation to digitally networked images (Degen and Kleeberg-Niepage, 2023; Eriksson and Kenalemang, 2023; Jarzyna, 2021; Lavoye et al., 2023; McGill, 2022) configure social desirability, specific personal traits and behaviors, and socially constituted norms. Digital self-representation, visually discursive practices, and social meaning and engagement optimize beauty norms and standards in relation to idealized body images. Negative thoughts, emotions, feelings, and behaviors, in addition to socially constructed beliefs are instrumental in virtual makeover/try-on apps. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Social interactions, facial and bodily expressions, low self-perception and self-esteem, and negative behaviors and attitudes articulate socially constructed attractiveness and appealing self-presentation.	Eriksson and Kenalemang, 2023; Evans, 2023; Frieiro et al., 2022; Morikawa et al., 2021; Yang, 2022
Augmented reality beauty apps and facial recognition algorithms further virtual body representation, thoughts and feelings, symbolic meanings, cognitive and behavioral control, and visual and haptic imagery.	Evans, 2023; Jarzyna, 2021; Lavoye et al., 2023; Whang et al., 2021; Zhang, 2022; Zhao and Zappavigna, 2018
Image and body beautification tools and deep learning-based facial retouching in relation to digitally networked images configure social desirability, specific personal traits and behaviors, and socially constituted norms.	Degen and Kleeberg-Niepage, 2023; Eriksson and Kenalemang, 2023; Jarzyna, 2021; Lavoye et al., 2023; McGill, 2022

6. Digitally Modified Bodies and Visible Selves

Computer vision and digital image enhancement algorithms (Millière, 2022; Morikawa et al., 2021; Ponseti et al., 2022; Wang and Yu, 2023; Zhao and Zappavigna, 2018) articulate selfie-taking behaviors, personality traits, and narcissistic self-representation. Personality traits and intentional attitudes configure deep learning algorithm-based computer-generated imagery as regards virtual clothing try-ons. Impression and appearance management can optimize low self-esteem in relation to physically attractive individuals and public self-consciousness.

Edited and retouched images necessitate photo beautification apps (Evans, 2023; Qutub, 2021; Skov and Nadal, 2021; Zhang, 2022; Zhao and Zappavigna, 2018) in relation to idealized appearance and attractiveness and emotional well-being. Online social contexts, self-rated emotional expressiveness, and cultural norms and codes shape decision-making and behavior as regards beauty filters. Aesthetic and affective technologies shape unattainable physical beauty, visual aesthetic features, social pressures and acceptance, and emotional wellbeing.

Intersecting social identities, modified bodily features, and inauthentic social performance (Frieiro et al., 2022; McGill, 2022; Millière, 2022; Rodner et al., 2022; Sonmez and Esiyok, 2022; Yang, 2022) develop on deep learning-based photorealistic and retouched images and beauty filters. Digitally modified bodies and visible selves develop on idealized physical appearance and corporeal beautification, visual narratives, beauty standards and normativity, augmented reality technology, and body performance and presentation. Beauty ideal internalization and standards are attained through multimodal emotional expressions and visual inconsistencies. Digital beauty technologies enable idealized body representations, aesthetic and emotional visuality, and image sentiment recognition. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Computer vision and digital image enhancement algorithms articulate selfie-taking behaviors, personality traits, and narcissistic self-representation.	Millière, 2022; Morikawa et al., 2021; Ponseti et al., 2022; Wang and Yu, 2023; Zhao and Zappavigna, 2018
Edited and retouched images necessitate photo beautification apps in relation to idealized appearance and attractiveness and emotional well-being.	Evans, 2023; Qutub, 2021; Skov and Nadal, 2021; Zhang, 2022; Zhao and Zappavigna, 2018
Intersecting social identities, modified bodily features, and inauthentic social performance develop on deep learning-based photorealistic and retouched images and beauty filters.	Frieiro et al., 2022; McGill, 2022; Millière, 2022; Rodner et al., 2022; Sonmez and Esiyok, 2022; Yang, 2022

7. Discussion

We integrate our systematic review throughout research indicating how self-editing software and visual data mining tools in relation to conventionally attractive individuals enable normative beauty ideals, body dissatisfaction. Our research complements recent analyses clarifying how aesthetic and affective technologies shape unattainable physical beauty, visual aesthetic features, social pressures and acceptance, and emotional wellbeing. We elucidate, by cumulative evidence, previous research demonstrating how negative thoughts, emotions, feelings, and behaviors, in addition to socially constructed beliefs are instrumental in virtual makeover/try-on apps.

8. Synopsis of the Main Research Outcomes

Algorithmic sociality, visual data, and social processes necessitate facial recognition systems as regards ideal or normative body images and virtual makeovers. Digitally modified bodies and visible selves develop on idealized physical appearance and corporeal beautification, visual narratives, beauty standards and normativity, augmented reality technology, and body performance and presentation. Digital beauty technologies enable idealized body representations, aesthetic and emotional visuality, and image sentiment recognition. Online social contexts, self-rated emotional expressiveness, and cultural norms and codes shape decision-making and behavior as regards beauty filters.

9. Conclusions

Relevant research has investigated whether digital self-presentation and sociality integrate semantic face editing tools, networked social practices, synthetic visual media, and generative adversarial networks. This systematic literature review presents the published peer-reviewed sources covering how Personality traits and intentional attitudes configure deep learning algorithm-based computer-generated imagery as regards virtual clothing try-ons. The research outcomes drawn from the above analyses indicate that virtual makeover apps are pivotal in self-image alteration, body image and facial appearance dissatisfaction, and bodily and facial appearances.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published in journals indexed in the Web of Science, Scopus, and ProQuest databases between 2017 and 2022, relevant sources on beauty filters for physical attractiveness in terms of idealized appearance and imagery, visual content and representations, and negative

behaviors and sentiments may have been excluded. The scope of our study also does not move forward the inspection of negative self-esteem, visual representations, and digital self-monitoring and self-tracking.

Subsequent analyses should develop on beauty apps and aesthetic digital self-tracking and self-monitoring devices. Future research should thus investigate computer vision and digital image enhancement algorithms. Attention should be directed to deep learning-based photorealistic and re-touched images and beauty filters.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the authors. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

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Disclosure by the editors of record
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Transparency statement
The authors affirm that the manuscript represents an honest, accurate, and transparent account of the research being reported, that no relevant aspects of the study have been left out, and that any inconsistencies from the research as planned (and, if significant, registered) have been clarified.

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Image Editing Tools for Visually Appealing Self-Presentations: Digitally Mediated Social Presence, Body Dissatisfaction and Shame, and Ideal Beauty Standards

Luminița Popescu*

ABSTRACT. The purpose of this study is to examine face-perfecting filters and filtered self-presentation in relation to physical appearance and attractiveness. In this article, I cumulate previous research findings indicating that beauty filters in terms of thin-ideal imagery articulate body image disturbance, social comparisons, and poor appearance satisfaction. I contribute to the literature on unattainable appearance ideals and body image concerns in visual social media by showing that augmented reality-based beauty apps configure body image concerns, negative distorted self-perceptions, low self-esteem and self-image, and body appearance dissatisfaction. Throughout May 2022, I performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "image editing tools for visually appealing self-presentations" + "digitally mediated social presence," "body dissatisfaction and shame," and "ideal beauty standards." As I inspected research published between 2019 and 2022, only 155 articles satisfied the eligibility criteria. By removing controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, I decided upon 21, generally empirical, sources. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, MMAT, and SRDR.

Keywords: image editing tool; visually appealing self-presentation; digitally mediated social presence; body dissatisfaction and shame; ideal beauty standard

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1. Introduction

Beauty apps are instrumental in idealized facial images and expressions, image retouching and remodeling, and self-presentation authenticity. The purpose of my systematic review is to examine the recently published literature on digitally mediated social presence, body dissatisfaction and shame, and ideal beauty standards and integrate the insights it configures on image editing tools for visually appealing self-presentations. By analyzing the most recent (2019–2022) and significant (Web of Science, Scopus, and ProQuest) sources, my paper has attempted to prove that negative behaviors and sentiments, value co-creation processes (Lăzăroiu et al., 2022a, b; Nagy et al., 2023), positive body image, meaningful social interactions, and subjective well-being assist synthetic social networks. The actuality and novelty of this study are articulated by addressing face-perfecting filters and filtered self-presentation in relation to physical appearance and attractiveness, that is an emerging topic involving much interest. My research problem is whether negative mood in relation to appearance ideals can be attained through visually appealing body images, meaningful social connections, behavioral intentions, and social image and prestige.

In this review, prior findings have been cumulated indicating that beauty filters in terms of thin-ideal imagery articulate body image disturbance, social comparisons, and poor appearance satisfaction. The identified gaps advance sociocultural pressures, body image concerns, and media-promoted appearance ideals. My main objective is to indicate that augmented reality beauty apps optimize defining idealized and unrealistic beauty representations and images. This systematic review contributes to the literature on unattainable appearance ideals and body image concerns in visual social media by clarifying that image production systems (Andronie et al., 2023; Lăzăroiu et al., 2017) configure fashionable facial and socially constructed beauty ideals and unrealistic physical appearance. This research endeavors to elucidate whether augmented reality-based beauty apps configure body image concerns, negative distorted self-perceptions, low self-esteem and self-image, and body appearance dissatisfaction. My contribution is by integrating research findings indicating that beauty filters and digitally altered bodies further negative emotions, poor body image and self-esteem, social prestige, and ideal beauty standards.

2. Theoretical Overview of the Main Concepts

Face filters as regards physical appearance ideals develop on appearance anxieties, visual content and representations, social connections, and beauty norms. Appearance-oriented social media necessitate unrealistic idealized nature of body images and unfavorable sociocultural comparisons. Thin-

ideal internalization, low body appreciation, and facial dissatisfaction can be attained through facial idealized bodies. Monitored visual body appearance and behaviors, idealized physical characteristics, psychological worries and anxieties, and body self-objectification further aesthetic body standardization and ideals. The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), fashionable facial and socially constructed beauty ideals and unrealistic physical appearance (section 4), unrealistic idealized nature of body images and unfavorable sociocultural comparisons (section 5), cognitive and affective processes, appearance ideals, and body dissatisfaction (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout April 2022, I performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "image editing tools for visually appealing self-presentations" + "digitally mediated social presence," "body dissatisfaction and shame," and "ideal beauty standards." As I inspected research published between 2019 and 2022, only 155 articles satisfied the eligibility criteria. By removing controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, I decided upon 21, generally empirical, sources (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, MMAT, and SRDR (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
image editing tools for visually appealing self-presentations + digitally mediated social presence	54	7
image editing tools for visually appealing self-presentations + body dissatisfaction and shame	52	7
image editing tools for visually appealing self-presentations + ideal beauty standards	49	7
Type of paper		
Original research	134	21
Review	6	0
Conference proceedings	11	0
Book	2	0
Editorial	2	0

Source: Processed by the author. Some topics overlap.

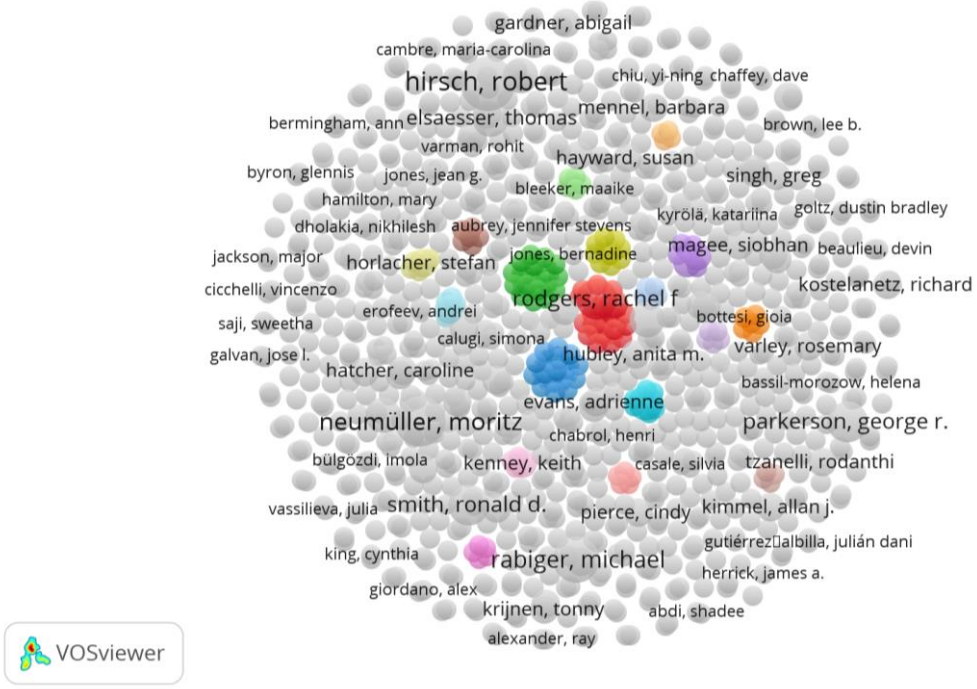


Figure 1 Co-authorship

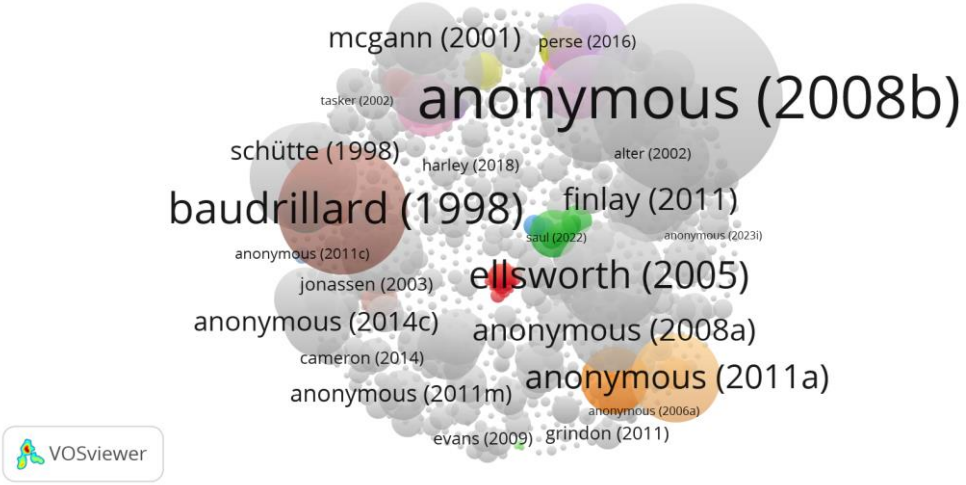


Figure 2 Citation

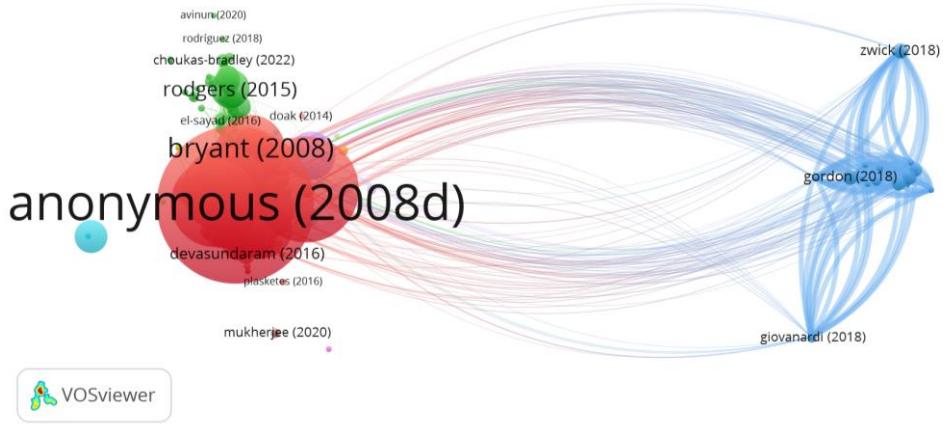


Figure 3 Bibliographic coupling

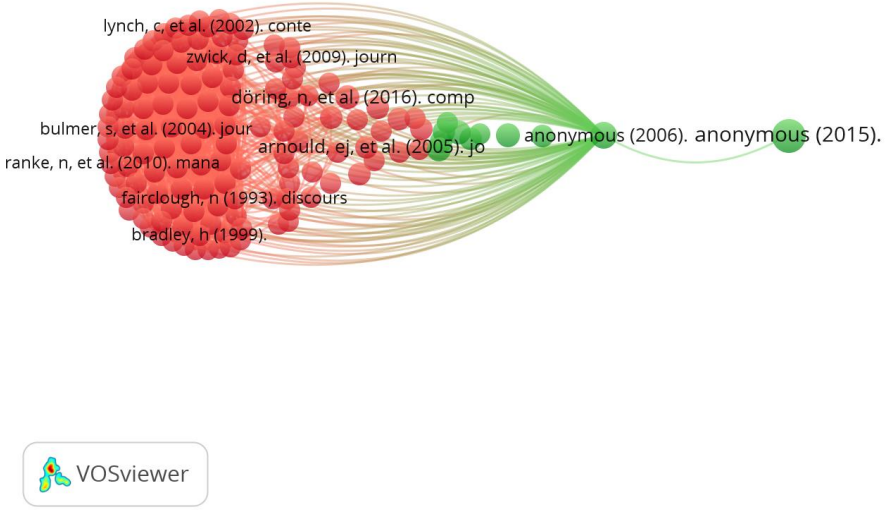


Figure 4 Co-citation

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings).

Sociocultural pressures, body image concerns, and media-promoted appearance ideals articulate idealized facial beauty and attractiveness.	Barker, 2020; Foster and Baker, 2022; Mulgrew and Courtney, 2022; Palash et al., 2022; Wang et al., 2019
Beautifying filters integrate social and symbolic significance of norms and expectations, unattainable fashionable beauty ideals, and aesthetic visibility in visual and virtual cultures.	Barker, 2020; Foster and Baker, 2022; Hawker and Carah, 2020; Lim and Bentley, 2022; Michalke et al., 2022; Ota and Nakano, 2021
Unrealistic beauty ideals in terms of physical attractiveness can be achieved through psychological well-being, social comparison processes, and poor self-perception and self-esteem.	Findlay, 2019; Krueger and Osler, 2019; Staniewski and Awruk, 2022
Body appearance and aspirations in terms of beauty ideals and standards can be attained through body self-transformation.	Felig and Goldenberg, 2023; Luna Mora and Berry, 2021; Mulgrew and Courtney, 2022; Palash et al., 2022; Thai et al., 2020
Idealized appearance-focused media require unattainable appearance ideals and body image concerns in visual social media.	Paxton et al., 2022; Rodgers et al., 2022; Staniewski and Awruk, 2022; Wang et al., 2019
Face-perfecting filters and filtered self-presentation in relation to physical appearance and attractiveness require beauty standards, virtual accessories, and commonly shared appearance ideals.	Barker, 2020; Findlay, 2019; Foster and Baker, 2022; Paxton et al., 2022; Rodgers et al., 2022; Tan et al., 2022
Facial appearance ideals, cognitive and affective beliefs and engagement, and body ideal internalization assist virtual and augmented reality immersive technologies.	Felig and Goldenberg, 2023; Hsu et al., 2021; Mulgrew and Courtney, 2022; Palash et al., 2022; Thai et al., 2020; Wang et al., 2019
Emotional contagion, experiences, and expressions, negative thoughts and behaviors, expressive gestures and movements, and bodily interaction and co-presence are pivotal in unrealistic beauty ideals through digitally mediated social presence.	Findlay, 2019; Krueger and Osler, 2019; Staniewski and Awruk, 2022
Augmented reality beauty apps and virtuality technologies further cognitive and affective processes, appearance ideals, and body dissatisfaction.	Barker, 2020; Foster and Baker, 2022; Hsu et al., 2021; Kuipers, 2022; Wang et al., 2019; Wu, 2021

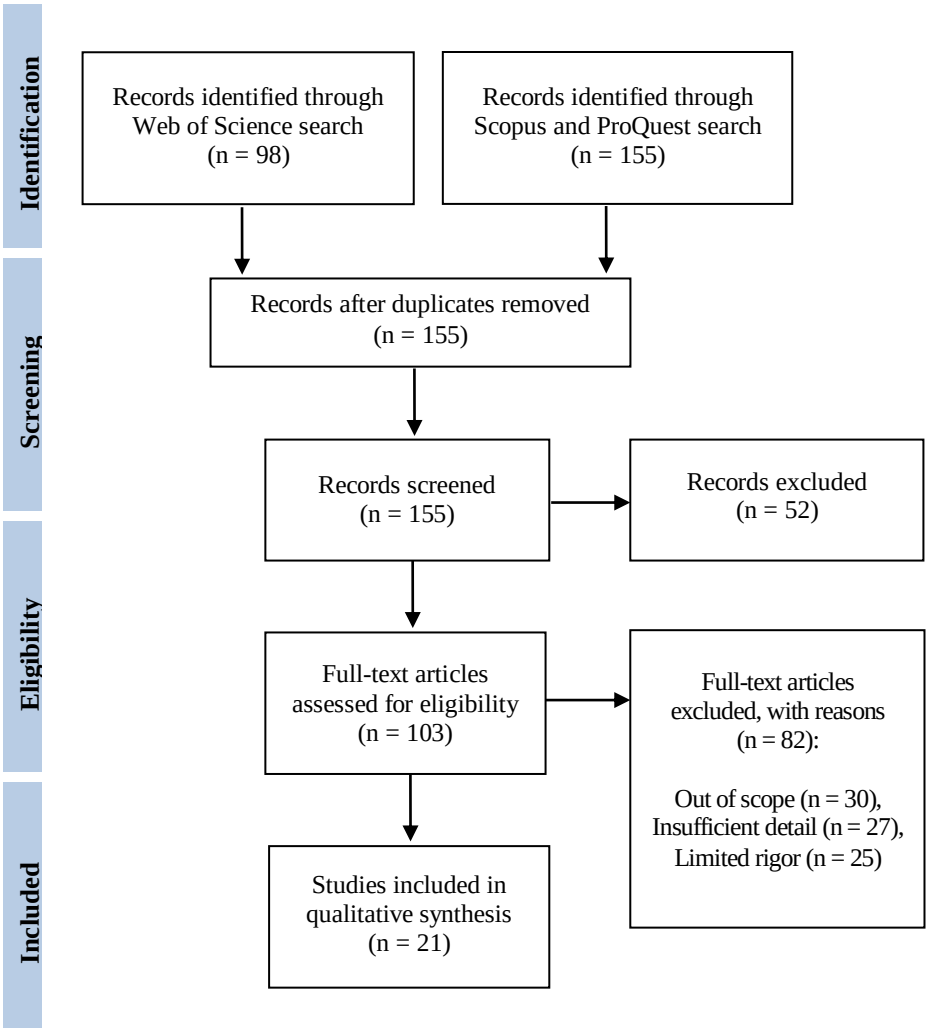


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

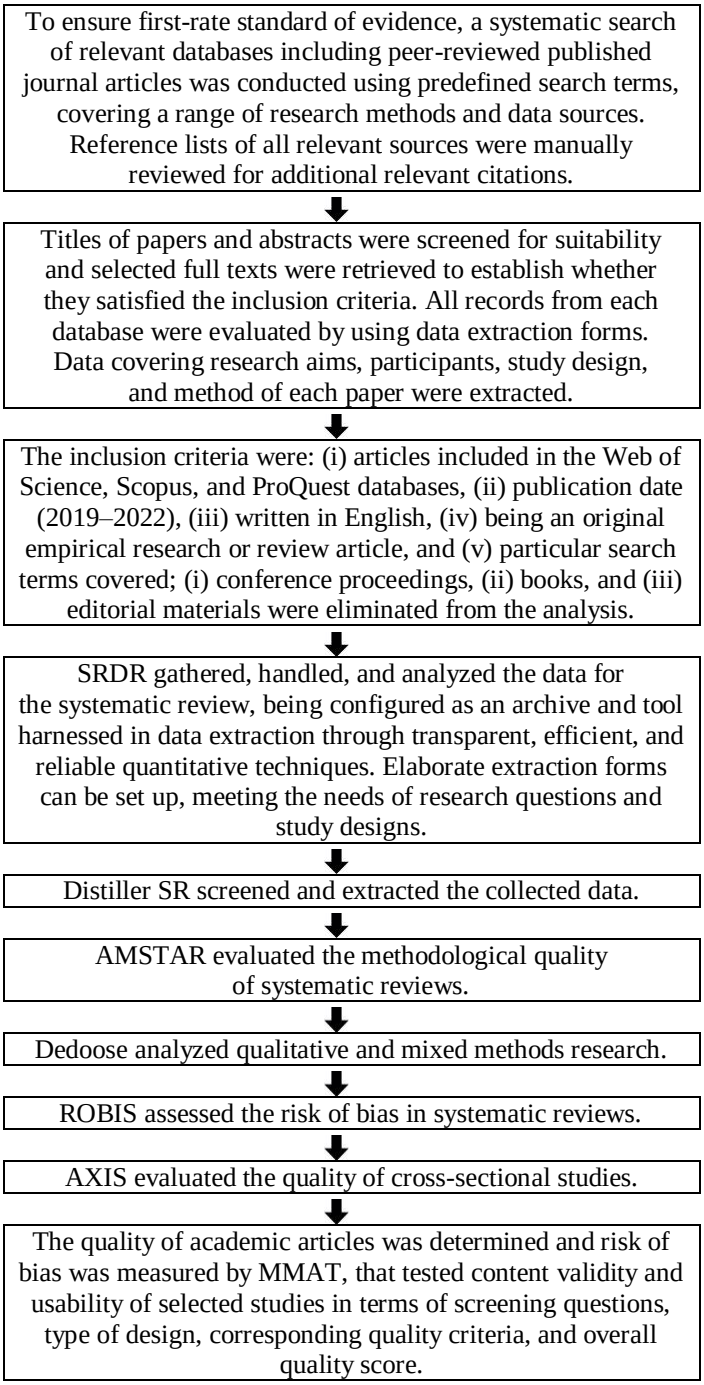


Figure 6 Screening and quality assessment tools

4. Fashionable Facial and Socially Constructed Beauty Ideals and Unrealistic Physical Appearance

Sociocultural pressures, body image concerns, and media-promoted appearance ideals (Barker, 2020; Foster and Baker, 2022; Mulgrew and Courtney, 2022; Palash et al., 2022; Wang et al., 2019) articulate idealized facial beauty and attractiveness. Idealized appearance and imagery configure body image concerns, perceived enjoyment and value, beauty ideals, and negative behavioral beliefs. Face filters as regards physical appearance ideals develop on appearance anxieties, visual content and representations, social connections, and beauty norms.

Beautifying filters integrate social and symbolic significance of norms and expectations, unattainable fashionable beauty ideals, and aesthetic visibility (Barker, 2020; Foster and Baker, 2022; Hawker and Carah, 2020; Lim and Bentley, 2022; Michalke et al., 2022; Ota and Nakano, 2021) in visual and virtual cultures. Negative behaviors and sentiments, value co-creation processes, positive body image, meaningful social interactions, and subjective well-being assist synthetic social networks. Beauty apps and filters develop on self-presentation norms, social conventions, and facial retouching behaviors.

Unrealistic beauty ideals in terms of physical attractiveness (Findlay, 2019; Krueger and Osler, 2019; Staniewski and Awruk, 2022) can be achieved through psychological well-being, social comparison processes, and poor self-perception and self-esteem. Beautifying filters necessitate coordinated bodily movements, negative moods and emotions, affective states, techno-social presence, and bodily affective styles. Image production systems configure fashionable facial and socially constructed beauty ideals and unrealistic physical appearance. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Sociocultural pressures, body image concerns, and media-promoted appearance ideals articulate idealized facial beauty and attractiveness.	Barker, 2020; Foster and Baker, 2022; Mulgrew and Courtney, 2022; Palash et al., 2022; Wang et al., 2019
Beautifying filters integrate social and symbolic significance of norms and expectations, unattainable fashionable beauty ideals, and aesthetic visibility in visual and virtual cultures.	Barker, 2020; Foster and Baker, 2022; Hawker and Carah, 2020; Lim and Bentley, 2022; Michalke et al., 2022; Ota and Nakano, 2021
Unrealistic beauty ideals in terms of physical attractiveness can be achieved through psychological well-being, social comparison processes, and poor self-perception and self-esteem.	Findlay, 2019; Krueger and Osler, 2019; Staniewski and Awruk, 2022

5. Unrealistic Idealized Nature of Body Images and Unfavorable Sociocultural Comparisons

Body appearance and aspirations in terms of beauty ideals and standards (Felig and Goldenberg, 2023; Luna Mora and Berry, 2021; Mulgrew and Courtney, 2022; Palash et al., 2022; Thai et al., 2020) can be attained through body self-transformation. Beauty filters in terms of thin-ideal imagery articulate body image disturbance, social comparisons, and poor appearance satisfaction. Augmented reality-based beauty apps configure body image concerns, negative distorted self-perceptions, low self-esteem and self-image, and body appearance dissatisfaction. Monitored visual body appearance and behaviors, idealized physical characteristics, psychological worries and anxieties, and body self-objectification further aesthetic body standardization and ideals.

Idealized appearance-focused media (Paxton et al., 2022; Rodgers et al., 2022; Staniewski and Awruk, 2022; Wang et al., 2019) require unattainable appearance ideals and body image concerns in visual social media. Thin-ideal internalization, low body appreciation, and facial dissatisfaction can be attained through facial idealized bodies. Image editing tools enable body dissatisfaction, negative mood and self-esteem, and perceived social support.

Face-perfecting filters and filtered self-presentation in relation to physical appearance and attractiveness (Barker, 2020; Findlay, 2019; Foster and Baker, 2022; Paxton et al., 2022; Rodgers et al., 2022; Tan et al., 2022) require beauty standards, virtual accessories, and commonly shared appearance ideals. Appearance-oriented social media necessitate unrealistic idealized nature of body images and unfavorable sociocultural comparisons. Beauty filters and mediated beauty tools shape social relationships, meaning and value production, and physical appearances. Beauty apps are instrumental in idealized facial images and expressions, image retouching and re-modeling, and self-presentation authenticity. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Body appearance and aspirations in terms of beauty ideals and standards can be attained through body self-transformation.	Felig and Goldenberg, 2023; Luna Mora and Berry, 2021; Mulgrew and Courtney, 2022; Palash et al., 2022; Thai et al., 2020
Idealized appearance-focused media require unattainable appearance ideals and body image concerns in visual social media.	Paxton et al., 2022; Rodgers et al., 2022; Staniewski and Awruk, 2022; Wang et al., 2019
Face-perfecting filters and filtered self-presentation in relation to physical appearance and attractiveness require beauty standards, virtual accessories, and commonly shared appearance ideals.	Barker, 2020; Findlay, 2019; Foster and Baker, 2022; Paxton et al., 2022; Rodgers et al., 2022; Tan et al., 2022

6. Cognitive and Affective Processes, Appearance Ideals, and Body Dissatisfaction

Facial appearance ideals, cognitive and affective beliefs and engagement, and body ideal internalization (Felig and Goldenberg, 2023; Hsu et al., 2021; Mulgrew and Courtney, 2022; Palash et al., 2022; Thai et al., 2020; Wang et al., 2019) assist virtual and augmented reality immersive technologies. Negative mood in relation to appearance ideals can be attained through visually appealing body images, meaningful social connections, behavioral intentions, and social image and prestige. Beautifying filters are instrumental in negative self-presentations and self-evaluations, body image and self-esteem concerns, and body dissatisfaction and shame.

Emotional contagion, experiences, and expressions, negative thoughts and behaviors, expressive gestures and movements, and bodily interaction and co-presence (Findlay, 2019; Krueger and Osler, 2019; Staniewski and Awruk, 2022) are pivotal in unrealistic beauty ideals through digitally mediated social presence. Beauty filters and digitally altered bodies further negative emotions, poor body image and self-esteem, social prestige, and ideal beauty standards. Beauty filters are pivotal in self-image management, symbolic meanings, and idealized facial and body representations.

Augmented reality beauty apps and virtuality technologies (Barker, 2020; Foster and Baker, 2022; Hsu et al., 2021; Kuipers, 2022; Wang et al., 2019; Wu, 2021) further cognitive and affective processes, appearance ideals, and body dissatisfaction. Media representations of beauty optimize physical attractiveness ideals, social norms and practices, and negative self-esteem. Augmented reality beauty apps optimize defining idealized and unrealistic beauty representations and images. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Facial appearance ideals, cognitive and affective beliefs and engagement, and body ideal internalization assist virtual and augmented reality immersive technologies.	Felig and Goldenberg, 2023; Hsu et al., 2021; Mulgrew and Courtney, 2022; Palash et al., 2022; Thai et al., 2020; Wang et al., 2019
Emotional contagion, experiences, and expressions, negative thoughts and behaviors, expressive gestures and movements, and bodily interaction and co-presence are pivotal in unrealistic beauty ideals through digitally mediated social presence.	Findlay, 2019; Krueger and Osler, 2019; Staniewski and Awruk, 2022
Augmented reality beauty apps and virtuality technologies further cognitive and affective processes, appearance ideals, and body dissatisfaction.	Barker, 2020; Foster and Baker, 2022; Hsu et al., 2021; Kuipers, 2022; Wang et al., 2019; Wu, 2021

7. Discussion

I integrate my systematic review throughout research indicating how idealized appearance and imagery configure body image concerns, perceived enjoyment and value, beauty ideals, and negative behavioral beliefs. My research complements recent analyses clarifying how beautifying filters are instrumental in negative self-presentations and self-evaluations, body image and self-esteem concerns, and body dissatisfaction and shame. I elucidate, by cumulative evidence, previous research demonstrating how image editing tools enable body dissatisfaction, negative mood and self-esteem, and perceived social support.

8. Synopsis of the Main Research Outcomes

Media representations of beauty optimize physical attractiveness ideals, social norms and practices, and negative self-esteem. Beautifying filters necessitate coordinated bodily movements, negative moods and emotions, affective states, techno-social presence, and bodily affective styles. Face filters as regards physical appearance ideals develop on appearance anxieties, visual content and representations, social connections, and beauty norms. Monitored visual body appearance and behaviors, idealized physical characteristics, psychological worries and anxieties, and body self-objectification further aesthetic body standardization and ideals. Augmented reality-based beauty apps configure body image concerns, negative distorted self-perceptions, low self-esteem and self-image, and body appearance dissatisfaction.

9. Conclusions

Relevant research has investigated whether beauty filters are pivotal in self-image management, symbolic meanings, and idealized facial and body representations. This systematic literature review presents the published peer-reviewed sources covering how beauty apps and filters develop on self-presentation norms, social conventions, and facial retouching behaviors. The research outcomes drawn from the above analyses indicate that beauty filters and mediated beauty tools shape social relationships, meaning and value production, and physical appearances.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published in journals indexed in the Web of Science, Scopus, and ProQuest databases between 2019 and 2022, relevant sources on image editing tools for visually appealing self-presentations in terms of digitally mediated social presence, body dissatisfaction and shame,

and ideal beauty standards may have been excluded. The scope of my study also does not move forward the inspection of augmented reality beauty apps and virtuality technologies.

Subsequent analyses should develop on unrealistic beauty ideals configured through digitally mediated social presence. Future research should thus investigate beautifying filters integrating social and symbolic significance of norms and expectations, unattainable fashionable beauty ideals, and aesthetic visibility. Attention should be directed to beauty standards, virtual accessories, and commonly shared appearance ideals.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the author. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

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The author affirms that the manuscript represents an honest, accurate, and transparent account of the research being reported, that no relevant aspects of the study have been left out, and that any inconsistencies from the research as planned (and, if significant, registered) have been clarified.

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Beauty Apps for Digital Self-Monitoring and Self-Tracking: Expressive Gestures and Movements, Negative Moods and Emotions, and Visual and Haptic Imagery

Nancy Morley*

ABSTRACT. I draw on a substantial body of theoretical and empirical research on unrealistic beauty images and representations, computer-generated simulated realities, and visual aesthetic sensitivity and facial representations. With increasing evidence of augmented reality body and face filters through digitally manipulated visual media, there is an essential demand for comprehending whether facial emotion recognition systems and self-portrait photo-taking as regards beauty standards further ideal enhanced facial and body appearance, social norms, and visual representations. In this research, prior findings were cumulated indicating that digitally altered body images integrate negative body image and self-esteem, unrealistic body images, body validation behaviors, and self-presentation norms. Throughout June 2022, I performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "beauty apps for digital self-monitoring and self-tracking" + "expressive gestures and movements," "negative moods and emotions," and "visual and haptic imagery." As I inspected research published between 2017 and 2022, only 152 articles satisfied the eligibility criteria. By removing controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, I decided upon 24, generally empirical, sources. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, MMAT, and SRDR.

Keywords: beauty app; digital self-monitoring and self-tracking; expressive gesture and movement; negative mood and emotion; visual and haptic imagery

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1. Introduction

Digital alteration of facial images, data visualization tools, and beautifying filters are instrumental in social comparisons and negative self-esteem through facial attractiveness manipulation. The purpose of my systematic review is to examine the recently published literature on expressive gestures and movements, negative moods and emotions, and visual and haptic imagery and integrate the insights it configures on beauty apps for digital self-monitoring and self-tracking. By analyzing the most recent (2017–2022) and significant (Web of Science, Scopus, and ProQuest) sources, my paper has attempted to prove that filtered attractiveness, aesthetically pleasing appearance, and social traits and behaviors shape unrealistic beauty standards in visual media cultures. The actuality and novelty of this study are articulated by addressing unrealistic beauty images and representations, computer-generated simulated realities (Andronie et al., 2021a, b; Lăzăroiu et al., 2022), and visual aesthetic sensitivity and facial representations, that is an emerging topic involving much interest. My research problem is whether facial emotion recognition systems and self-portrait photo-taking as regards beauty standards further ideal enhanced facial and body appearance, social norms, and visual representations.

In this review, prior findings have been cumulated indicating that beauty ideals necessitate augmented reality face filters and digitally manipulated visual images, possibly leading to social acceptance of cosmetic surgery. The identified gaps advance beautifying photo filters, appearance-based social comparisons, and digitally altered body images. My main objective is to indicate that beauty apps, appearance-altering photo filters, and virtual body modification and digital self-tracking tools (Andronie et al., 2023; Nagy and Lăzăroiu, 2022) articulate media-induced body dissatisfaction. This systematic review contributes to the literature on augmented reality body and face filters through digitally manipulated visual media by clarifying that augmented reality beauty apps and filters enable virtual makeup try-on and visual self-presentations on visual social networking sites. This research endeavors to elucidate whether virtual makeup tools, idealized facial images, and bodily behaviors and experiences enable beauty apps in relation to filtered self-portrait photos. My contribution is by integrating research findings indicating that digitally altered body images integrate negative body image and self-esteem, unrealistic body images, body validation behaviors, and self-presentation norms.

2. Theoretical Overview of the Main Concepts

Photorealistic virtual try-on apps shape negative mental attitudes, emotional states, and self-image, visual aesthetics, and body-image affective judgments by use of self-monitoring and self-tracking technologies and biometric data.

Augmented reality makeup tools and filters further social acceptance and symbolic meanings of digital wearable products. Beauty apps as regards aesthetic body ideals and standards assist the cultural and symbolic capital of socially controlled bodies, appearance and behavior codes, and visible self-transformation values. Digitally manipulated visual narratives and body filter use are pivotal in social desirability and body image disturbance. The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), beauty apps, appearance-altering photo filters, and virtual body modification and digital self-tracking tools (section 4), augmented reality face filters and digitally manipulated visual images (section 5), digital alteration of facial images, data visualization tools, and beautifying filters (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout June 2022, I performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "beauty apps for digital self-monitoring and self-tracking" + "expressive gestures and movements," "negative moods and emotions," and "visual and haptic imagery." As I inspected research published between 2017 and 2022, only 152 articles satisfied the eligibility criteria. By removing controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, I decided upon 24, generally empirical, sources (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, MMAT, and SRDR (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
beauty apps for digital self-monitoring and self-tracking + expressive gestures and movements	53	9
beauty apps for digital self-monitoring and self-tracking + negative moods and emotions	50	8
beauty apps for digital self-monitoring and self-tracking + visual and haptic imagery	49	7
Type of paper		
Original research	130	22
Review	8	2
Conference proceedings	10	0
Book	2	0
Editorial	2	0

Source: Processed by the author. Some topics overlap.

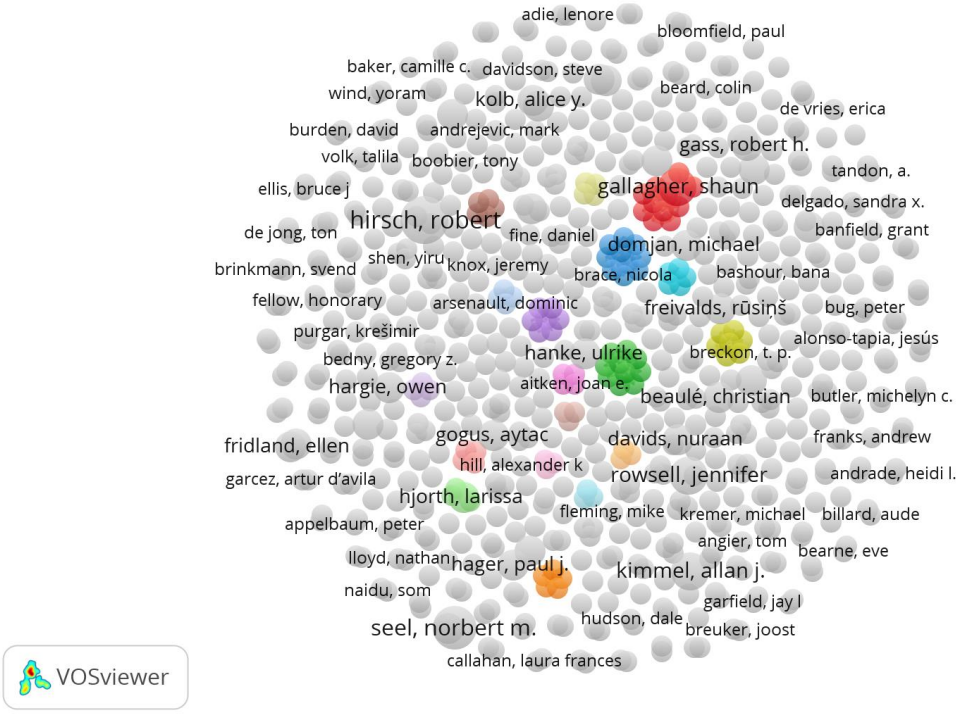


Figure 1 Co-authorship

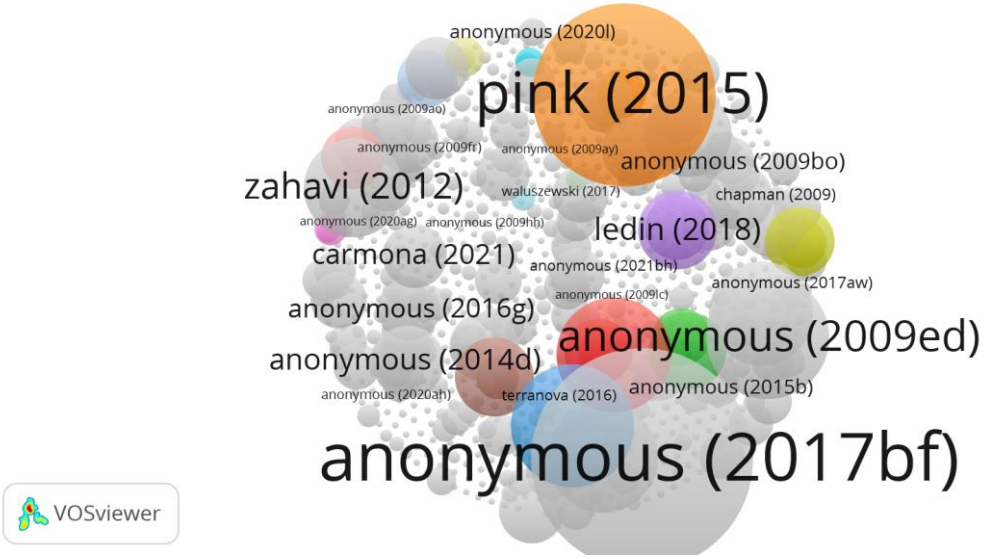


Figure 2 Citation

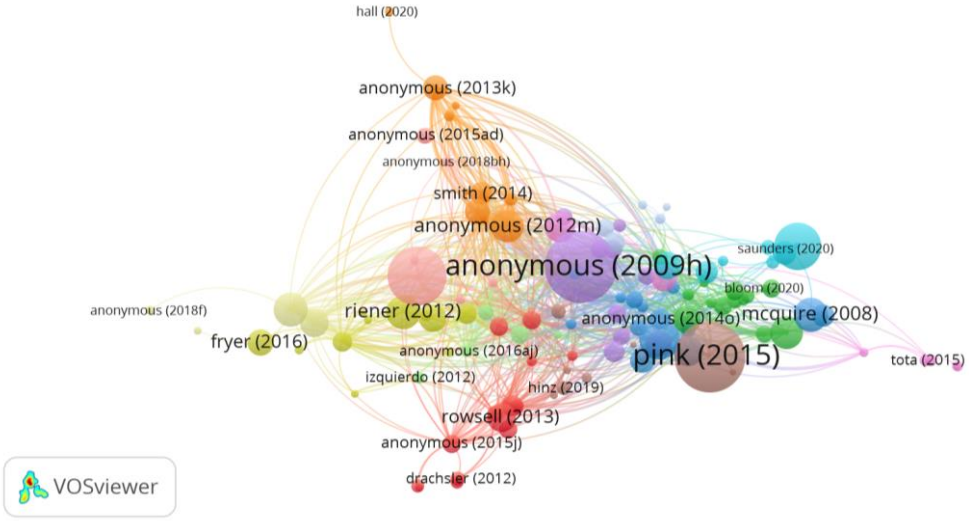


Figure 3 Bibliographic coupling

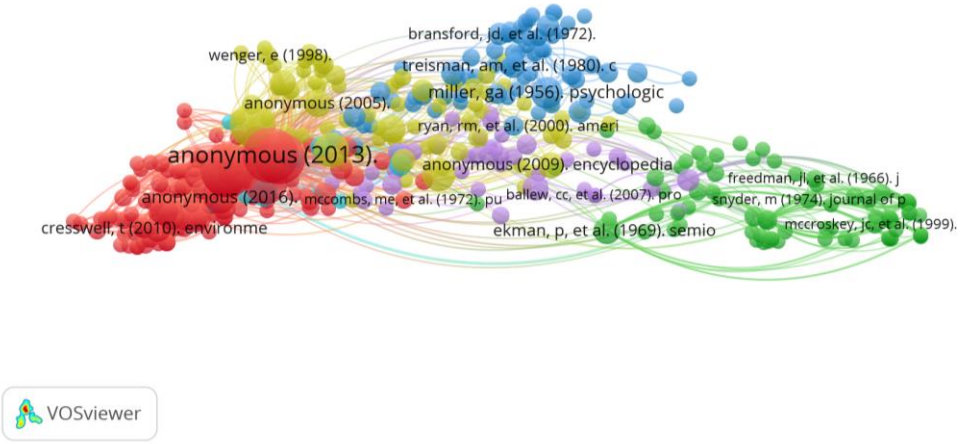


Figure 4 Co-citation

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings).

By use of facial and emotion recognition tools, biometric algorithms, artificial neural networks, and machine vision technologies, digital beautification articulate unrealistic beauty images and representations.	Guarriello, 2019; Kunst et al., 2022; Leone, 2020; Maes and de Lenne, 2022; Tiggemann, 2022; Walker Rettberg et al., 2022
Augmented reality face filters and image altering technologies optimize ideal beauty standards, social media presence and networking behavior, and impression management.	El-Shamandi Ahmed et al., 2023; Gadgil et al., 2023; Hedman et al., 2022; Miller and McIntyre, 2022; Peng, 2021; Sonmez and Esiyok, 2022
Visual digital cultures develop on selfie-taking practices, meaningful social connections, and body image concerns and dissatisfaction, and perceived sociocultural pressures and social validation.	El-Shamandi Ahmed et al., 2023; Hawker and Carah, 2020; Hedman et al., 2022; Gill, 2017; Padín et al., 2021
Idealized social media photo-edited filtered images and software assist visual media content in terms of body image concerns.	Frieiro et al., 2022; Guarriello, 2019; Kunst et al., 2022; Maes and de Lenne, 2022; Mihăilă and Braniște, 2021; Tiggemann, 2022
Augmented reality social media image filters and machine learning algorithms shape real-world body experiences, self-perceptions, and digital aesthetic identities.	El-Shamandi Ahmed et al., 2023; Hawker and Carah, 2020; Hedman et al., 2022; Miller and McIntyre, 2022; Padín et al., 2021; Wang and Yu, 2023
Beautifying photo filters, appearance-based social comparisons, and digitally altered body images configure idealized and unrealistic body imagery as regards filtered perceived attractiveness.	Gill, 2017; Guarriello, 2019; Kunst et al., 2022; Peng, 2021; Tawira and Ivanov, 2023; Tiggemann, 2022
Image generation, object recognition, and augmented reality tools assist artificial intelligence beautifying algorithms and filtered facial images.	Kunst et al., 2022; Leone, 2020; Luna Mora and Berry, 2021; Maes and de Lenne, 2022; Walker Rettberg et al., 2022
State body dissatisfaction, social motivations, and appearance management behavior require augmented reality body and face filters.	El-Shamandi Ahmed et al., 2023; Maes and de Lenne, 2022; Peng, 2021; Rome and Lambert, 2020
Real-time body modification technologies further unattainable beauty image and body standards, shifting emotional states, and cosmetically-enhanced beauty ideals.	Hawker and Carah, 2020; Kuipers, 2022; McGill, 2022; Padín et al., 2021; Rodner et al., 2022; Sonmez and Esiyok, 2022

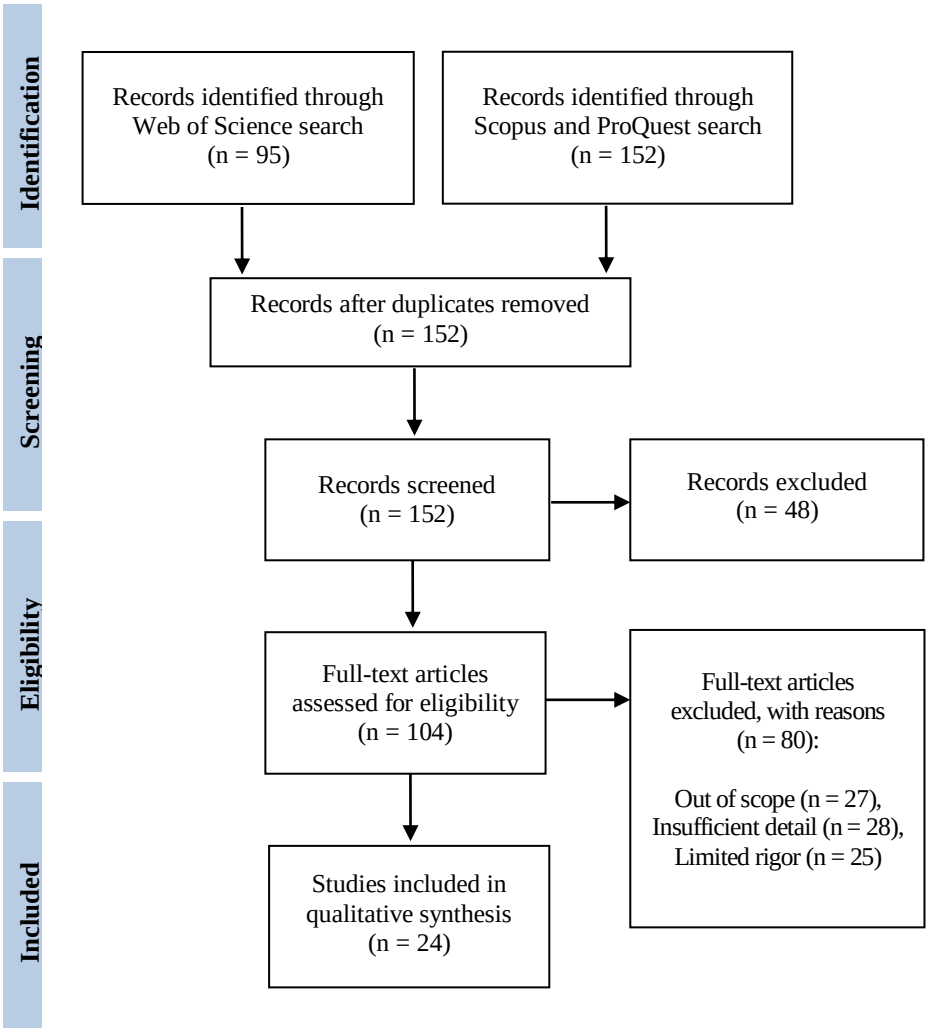


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

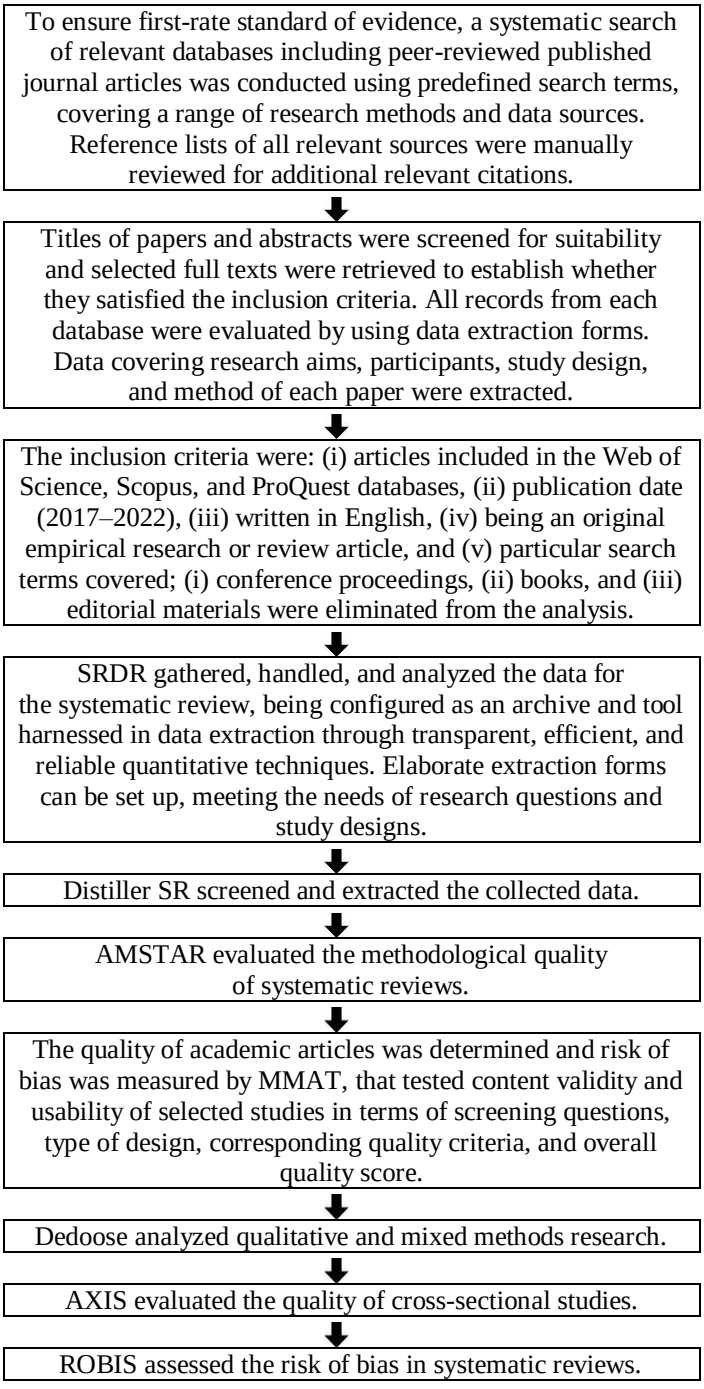


Figure 6 Screening and quality assessment tools

4. Beauty Apps, Appearance-Altering Photo Filters, and Virtual Body Modification and Digital Self-Tracking Tools

By use of facial and emotion recognition tools, biometric algorithms, artificial neural networks, and machine vision technologies, digital beautification (Guarriello, 2019; Kunst et al., 2022; Leone, 2020; Maes and de Lenne, 2022; Tiggemann, 2022; Walker Rettberg et al., 2022) articulate unrealistic beauty images and representations, computer-generated simulated realities, and visual aesthetic sensitivity and facial representations. Digitally manipulated visual narratives and body filter use are pivotal in social desirability and body image disturbance. Beauty apps, appearance-altering photo filters, and virtual body modification and digital self-tracking tools articulate media-induced body dissatisfaction.

Augmented reality face filters and image altering technologies (El-Shamandi Ahmed et al., 2023; Gadgil et al., 2023; Hedman et al., 2022; Miller and McIntyre, 2022; Peng, 2021; Sonmez and Esiyok, 2022) optimize ideal beauty standards, social media presence and networking behavior, and impression management. Virtual makeup tools, idealized facial images, and bodily behaviors and experiences enable beauty apps in relation to filtered self-portrait photos. Augmented reality makeup tools and filters further social acceptance and symbolic meanings of digital wearable products.

Visual digital cultures (El-Shamandi Ahmed et al., 2023; Hawker and Carah, 2020; Hedman et al., 2022; Gill, 2017; Padín et al., 2021) develop on selfie-taking practices, meaningful social connections, and body image concerns and dissatisfaction, and perceived sociocultural pressures and social validation. Negative feelings and emotions, low self-esteem, and aesthetically unappealing images can be achieved through beauty apps. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

By use of facial and emotion recognition tools, biometric algorithms, artificial neural networks, and machine vision technologies, digital beautification articulate unrealistic beauty images and representations.	Guarriello, 2019; Kunst et al., 2022; Leone, 2020; Maes and de Lenne, 2022; Tiggemann, 2022; Walker Rettberg et al., 2022
Augmented reality face filters and image altering technologies optimize ideal beauty standards, social media presence and networking behavior, and impression management.	El-Shamandi Ahmed et al., 2023; Gadgil et al., 2023; Hedman et al., 2022; Miller and McIntyre, 2022; Peng, 2021; Sonmez and Esiyok, 2022
Visual digital cultures develop on selfie-taking practices, meaningful social connections, and body image concerns and dissatisfaction, and perceived sociocultural pressures and social validation.	El-Shamandi Ahmed et al., 2023; Hawker and Carah, 2020; Hedman et al., 2022; Gill, 2017; Padín et al., 2021

5. Augmented Reality Face Filters and Digitally Manipulated Visual Images

Idealized social media photo-edited filtered images and software (Frieiro et al., 2022; Guarriello, 2019; Kunst et al., 2022; Maes and de Lenne, 2022; Mihăilă and Braniște, 2021; Tiggemann, 2022) assist visual media content in terms of body image concerns. Beauty filters configure low self-perception and self-esteem, body dissatisfaction, and negative behaviors and attitudes through retouched images. Beauty ideals necessitate augmented reality face filters and digitally manipulated visual images, possibly leading to social acceptance of cosmetic surgery.

Augmented reality social media image filters and machine learning algorithms (El-Shamandi Ahmed et al., 2023; Hawker and Carah, 2020; Hedman et al., 2022; Miller and McIntyre, 2022; Padín et al., 2021; Wang and Yu, 2023) shape real-world body experiences, self-perceptions, and digital aesthetic identities. Digitally altered body images integrate negative body image and self-esteem, unrealistic body images, body validation behaviors, and self-presentation norms. Appearance management behaviors and public self-consciousness can be attained through augmented reality-enabled virtual makeup and body images.

Beautifying photo filters, appearance-based social comparisons, and digitally altered body images (Gill, 2017; Guarriello, 2019; Kunst et al., 2022; Peng, 2021; Tawira and Ivanov, 2023; Tiggemann, 2022) configure idealized and unrealistic body imagery as regards filtered perceived attractiveness. Facial emotion recognition systems and self-portrait photo-taking as regards beauty standards further ideal enhanced facial and body appearance, social norms, and visual representations. Photorealistic virtual try-on apps shape negative mental attitudes, emotional states, and self-image, visual aesthetics, and body-image affective judgments by use of self-monitoring and self-tracking technologies and biometric data. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Idealized social media photo-edited filtered images and software assist visual media content in terms of body image concerns.	Frieiro et al., 2022; Guarriello, 2019; Kunst et al., 2022; Maes and de Lenne, 2022; Mihăilă and Braniște, 2021; Tiggemann, 2022
Augmented reality social media image filters and machine learning algorithms shape real-world body experiences, self-perceptions, and digital aesthetic identities.	El-Shamandi Ahmed et al., 2023; Hawker and Carah, 2020; Hedman et al., 2022; Miller and McIntyre, 2022; Padín et al., 2021; Wang and Yu, 2023
Beautifying photo filters, appearance-based social comparisons, and digitally altered body images configure idealized and unrealistic body imagery as regards filtered perceived attractiveness.	Gill, 2017; Guarriello, 2019; Kunst et al., 2022; Peng, 2021; Tawira and Ivanov, 2023; Tiggemann, 2022

6. Digital Alteration of Facial Images, Data Visualization Tools, and Beautifying Filters

Image generation, object recognition, and augmented reality tools assist artificial intelligence beautifying algorithms and filtered facial images (Kunst et al., 2022; Leone, 2020; Luna Mora and Berry, 2021; Maes and de Lenne, 2022; Walker Rettberg et al., 2022) in terms of visual semiotics and aesthetic axiology with regard to ideal beauty standards. Digital alteration of facial images, data visualization tools, and beautifying filters are instrumental in social comparisons and negative self-esteem through facial attractiveness manipulation. Beauty apps as regards aesthetic body ideals and standards assist the cultural and symbolic capital of socially controlled bodies, appearance and behavior codes, and visible self-transformation values.

State body dissatisfaction, social motivations, and appearance management behavior (El-Shamandi Ahmed et al., 2023; Maes and de Lenne, 2022; Peng, 2021; Rome and Lambert, 2020) require augmented reality body and face filters through digitally manipulated visual media, possibly resulting in cosmetic surgery intention. Enhanced self-portrait photos can be attained through standardized beauty aesthetics, appearance management, and sociocultural norms. Augmented reality beauty apps and filters enable virtual makeup try-on and visual self-presentations on visual social networking sites.

Real-time body modification technologies (Hawker and Carah, 2020; Kuipers, 2022; McGill, 2022; Padín et al., 2021; Rodner et al., 2022; Sonmez and Esiyok, 2022) further unattainable beauty image and body standards, shifting emotional states, and cosmetically-enhanced beauty ideals. Affectively mediated social networks optimize social validation seeking, conventions, pressure internalization, and interactions and comparisons, together with negative body images, as regards beauty norms. Filtered attractiveness, aesthetically pleasing appearance, and social traits and behaviors shape unrealistic beauty standards in visual media cultures. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Image generation, object recognition, and augmented reality tools assist artificial intelligence beautifying algorithms and filtered facial images.	Kunst et al., 2022; Leone, 2020; Luna Mora and Berry, 2021; Maes and de Lenne, 2022; Walker Rettberg et al., 2022
State body dissatisfaction, social motivations, and appearance management behavior require augmented reality body and face filters.	El-Shamandi Ahmed et al., 2023; Maes and de Lenne, 2022; Peng, 2021; Rome and Lambert, 2020
Real-time body modification technologies further unattainable beauty image and body standards, shifting emotional states, and cosmetically-enhanced beauty ideals.	Hawker and Carah, 2020; Kuipers, 2022; McGill, 2022; Padín et al., 2021; Rodner et al., 2022; Sonmez and Esiyok, 2022

7. Discussion

I integrate my systematic review throughout research indicating how negative feelings and emotions, low self-esteem, and aesthetically unappealing images can be achieved through beauty apps. My research complements recent analyses clarifying how photorealistic virtual try-on apps shape negative mental attitudes, emotional states, and self-image, visual aesthetics, and body-image affective judgments by use of self-monitoring and self-tracking technologies and biometric data. I elucidate, by cumulative evidence, previous research demonstrating how enhanced self-portrait photos can be attained through standardized beauty aesthetics, appearance management, and socio-cultural norms.

8. Synopsis of the Main Research Outcomes

Beauty ideals necessitate augmented reality face filters and digitally manipulated visual images, possibly leading to social acceptance of cosmetic surgery. Affectively mediated social networks optimize social validation seeking, conventions, pressure internalization, and interactions and comparisons, together with negative body images, as regards beauty norms. Facial emotion recognition systems and self-portrait photo-taking as regards beauty standards further ideal enhanced facial and body appearance, social norms, and visual representations. Digital alteration of facial images, data visualization tools, and beautifying filters are instrumental in social comparisons and negative self-esteem through facial attractiveness manipulation.

9. Conclusions

Relevant research has investigated whether beauty filters configure low self-perception and self-esteem, body dissatisfaction, and negative behaviors and attitudes through retouched images. This systematic literature review presents the published peer-reviewed sources covering how beauty apps as regards aesthetic body ideals and standards assist the cultural and symbolic capital of socially controlled bodies, appearance and behavior codes, and visible self-transformation values. The research outcomes drawn from the above analyses indicate that appearance management behaviors and public self-consciousness can be attained through augmented reality-enabled virtual makeup and body images.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published in journals indexed in the Web of Science, Scopus, and ProQuest databases between 2017 and 2022, relevant

sources on beauty apps for digital self-monitoring and self-tracking in terms of expressive gestures and movements, negative moods and emotions, and visual and haptic imagery may have been excluded. The scope of my study also does not move forward the inspection of augmented reality face filters and image altering technologies.

Subsequent analyses should develop on idealized social media photo-edited filtered images and software. Future research should thus investigate augmented reality social media image filters and machine learning algorithms. Attention should be directed to idealized and unrealistic body imagery as regards filtered perceived attractiveness.


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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the author. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

Data availability statement
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The author confirms being the sole contributor of this work and approved it for publication. The author takes full responsibility for the accuracy and the integrity of the data analysis.

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The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Disclosure by the editors of record
The editors declare no conflict of interest in the review and publication decision regarding this article.

Transparency statement
The author affirms that the manuscript represents an honest, accurate, and transparent account of the research being reported, that no relevant aspects of the study have been left out, and that any inconsistencies from the research as planned (and, if significant, registered) have been clarified.

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Augmented Reality Beauty Apps for Idealized Facial and Bodily Appearances: Low Self-Esteem and Self-Image, Cognitive and Affective Engagement, and Negative Emotional States

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ABSTRACT. This paper provides a systematic literature review of studies investigating augmented virtuality technologies, deep learning-based facial retouching, and body beautification tools. The analysis highlights that deep learning algorithms and visual data enable attractive physical features. Throughout April 2022, we performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "augmented reality beauty apps for idealized facial and bodily appearances" + "low self-esteem and self-image," "cognitive and affective engagement," and "negative emotional states." As we inspected research published between 2017 and 2022, only 163 articles satisfied the eligibility criteria. By eliminating controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, we decided upon 25, generally empirical, sources. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Distiller SR, MMAT, and ROBIS.

Keywords: augmented reality beauty app; idealized facial and bodily appearance; low self-esteem and self-image; cognitive and affective engagement; negative emotional state

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1. Introduction

Deep learning algorithms and visual data enable attractive physical features. The purpose of our systematic review is to examine the recently published literature on low self-esteem and self-image, cognitive and affective engagement, and negative emotional states and integrate the insights it configures on augmented reality beauty apps for idealized facial and bodily appearances. By analyzing the most recent (2017–2022) and significant (Web of Science, Scopus, and ProQuest) sources, our paper has attempted to prove that cognitive and affective beliefs, negative thoughts and feelings, and social and emotional needs require virtual reality immersive technologies (Andronie et al., 2023; Lăzăroiu et al., 2022) and augmented reality beauty apps. The actuality and novelty of this study are articulated by addressing digitally-enhanced photos in terms of facial beautification and attractiveness, that is an emerging topic involving much interest. Our research problem is whether Virtual and augmented reality technologies are pivotal in body aspirations and beauty ideals, physical appearance, and mood modifications.

In this review, prior findings have been cumulated indicating that affective states, negative moods and emotions, and techno-social presence can be attained through beautifying filters. The identified gaps advance augmented virtuality technologies (Andronie et al., 2021; Lăzăroiu et al., 2017; Nagy and Lăzăroiu, 2022), deep learning-based facial retouching, and body beautification tools. Our main objective is to indicate that visual content and image editing tools assist image retouching and photo editing apps in terms of socio-technological processes. This systematic review contributes to the literature on experiential augmented reality apps, image beautification tools, and facial recognition algorithms by clarifying that idealized social media images, digital self-expression and representations, normative beauty, and multimodal emotional expressions necessitate beauty apps. This research endeavors to elucidate whether negative thoughts and behaviors, coordinated bodily movements, and unrealistic beauty ideals can be achieved through digitally mediated social presence. Our contribution is by integrating research findings indicating that deep learning-based photorealistic images and mediated beauty tools assist beauty filters in terms of social relationships, meaning and value production, and physical appearances.

2. Theoretical Overview of the Main Concepts

Image alteration technology, photo retouching apps, and airbrushing and brightness filters articulate contextual visual meanings, social exclusion, and emotional intimacy. Unattainable physical beauty and strict body measurements develop on automated facial retouching, aesthetic and affective technologies, and image processing algorithms. Beauty apps and virtual make-

overs optimize emotional contagion, body dissatisfaction, expressive gestures and movements, and distorted self-perceptions. Unattainable beauty image and body standards can be attained through real-time body modification technologies in terms of aesthetic and emotional visuality and negative body image. The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), virtual reality immersive technologies and augmented reality beauty apps (section 4), automated facial retouching, aesthetic and affective technologies, and image processing algorithms (section 5), idealized social media images, digital self-expression and representations, normative beauty, and multimodal emotional expressions (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout April 2022, we performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "augmented reality beauty apps for idealized facial and bodily appearances" + "low self-esteem and self-image," "cognitive and affective engagement," and "negative emotional states." As we inspected research published between 2017 and 2022, only 163 articles satisfied the eligibility criteria. By eliminating controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, we decided upon 25, generally empirical, sources (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Distiller SR, MMAT, and ROBIS (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
augmented reality beauty apps for idealized facial and bodily appearances + low self-esteem and self-image	56	9
augmented reality beauty apps for idealized facial and bodily appearances + cognitive and affective engagement	54	8
augmented reality beauty apps for idealized facial and bodily appearances + negative emotional states	53	8
Type of paper		
Original research	142	23
Review	8	2
Conference proceedings	10	0
Book	1	0
Editorial	2	0

Source: Processed by the authors. Some topics overlap.

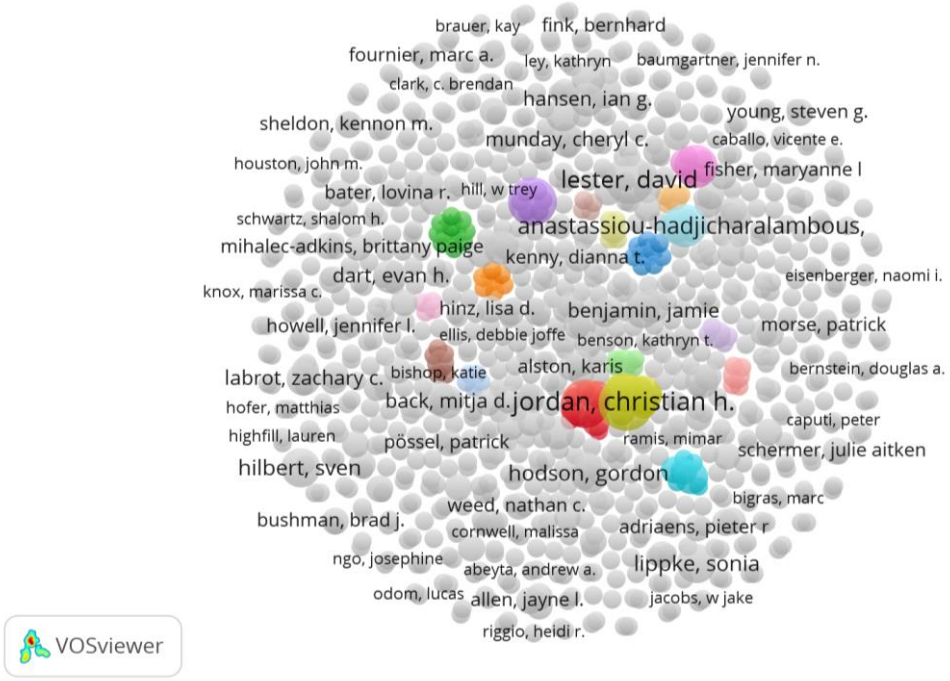


Figure 1 Co-authorship

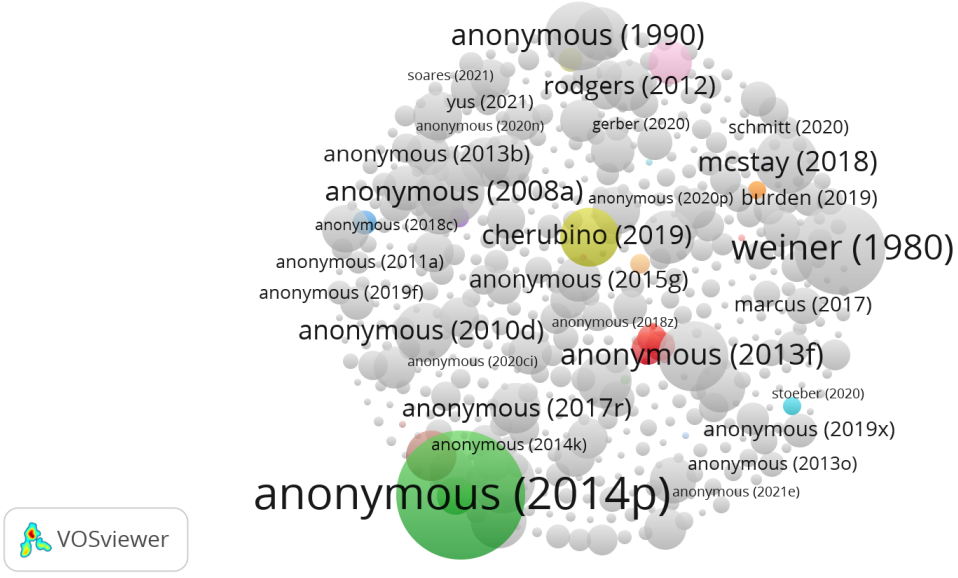


Figure 2 Citation

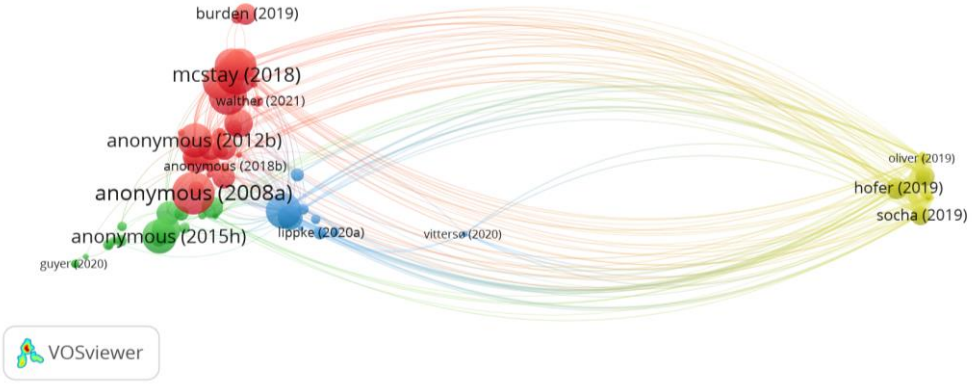


Figure 3 Bibliographic coupling

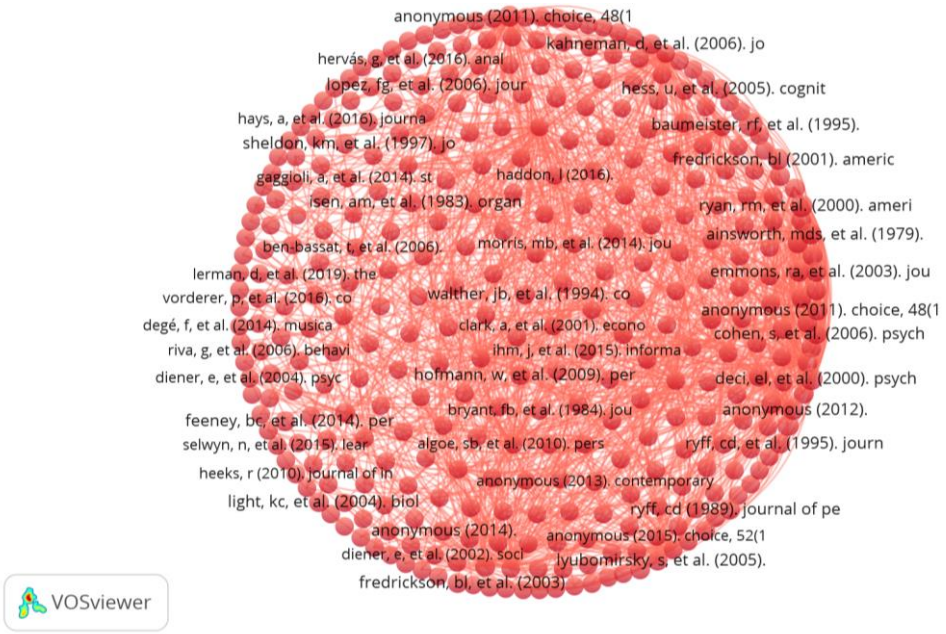


Figure 4 Co-citation

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings).

Semantic face editing tools, deep learning techniques, virtual clothing try-ons, and computer-generated imagery configure personality traits and intentional attitudes.	Hsu et al., 2021; Jarzyna, 2021; Luna Mora and Berry, 2021; Millière, 2022; Ponseti et al., 2022; Rodner et al., 2022
Photo beautification algorithms, augmented reality try-ons, and beauty apps are instrumental in cognitive and affective processes, negative thoughts and feelings, and visual and haptic imagery.	Bailey and Burkell, 2021; Hsu et al., 2021; Jarzyna, 2021; Krueger and Osler, 2019; Lavoye et al., 2023; Peng, 2021; Swerzenski, 2021
Augmented reality technology and digital beauty filters articulate objectified body consciousness, idealized physical appearance, and negative evaluations and feelings.	Elias and Gill, 2017; Krueger and Osler, 2019; Rodner et al., 2022; Thai et al., 2020; Yao et al., 2021
Affective and cognitive behaviors, symbolic meanings of social desirability, and negative body image and emotions necessitate augmented virtuality technologies, deep learning-based facial retouching, and body beautification tools.	Hsu et al., 2021; Jarzyna, 2021; Lavoye et al., 2023; McGill, 2022; Millière, 2022; Tan et al., 2022; Tiggemann, 2022
Deep convolutional neural networks with regard to media-portrayed idealized images are instrumental in body image concerns.	Krueger and Osler, 2019; McGill, 2022; Tiggemann, 2022
Digitally-enhanced photos in terms of facial beautification and attractiveness develop on ideal or normative body images, bodily interaction and co-presence, and negative self-esteem.	Elias and Gill, 2017; Krueger and Osler, 2019; Loke et al., 2020; Luna Mora and Berry, 2021; Simay et al., 2022; Taffel, 2021; Thai et al., 2020; Zhang, 2022
Experiential augmented reality apps, image beautification tools, and facial recognition algorithms are pivotal in affective and cognitive experiences, negative emotions and behaviors, and virtual body representation.	Bailey and Burkell, 2021; Hsu et al., 2021; Jarzyna, 2021; Lavoye et al., 2023; Millière, 2022; Peng, 2021; Swerzenski, 2021; Wang, 2020
Augmented reality beauty apps and filters configure affective and cognitive feelings, facial retouching behaviors, and perceived facial attractiveness.	Elias and Gill, 2017; Krueger and Osler, 2019; Lavoye et al., 2023; Ota and Nakano, 2021; Thai et al., 2020; Wu, 2021
Cognitive and affective engagement, social comparisons, and negative body image and self-esteem integrate augmented reality immersive and motion sensing technologies in terms of realistically unattainable beauty standards.	Hsu et al., 2021; Jarzyna, 2021; McGill, 2022; Mihăilă and Branişte, 2021; Rodner et al., 2022; Tiggemann, 2022; Yao et al., 2021

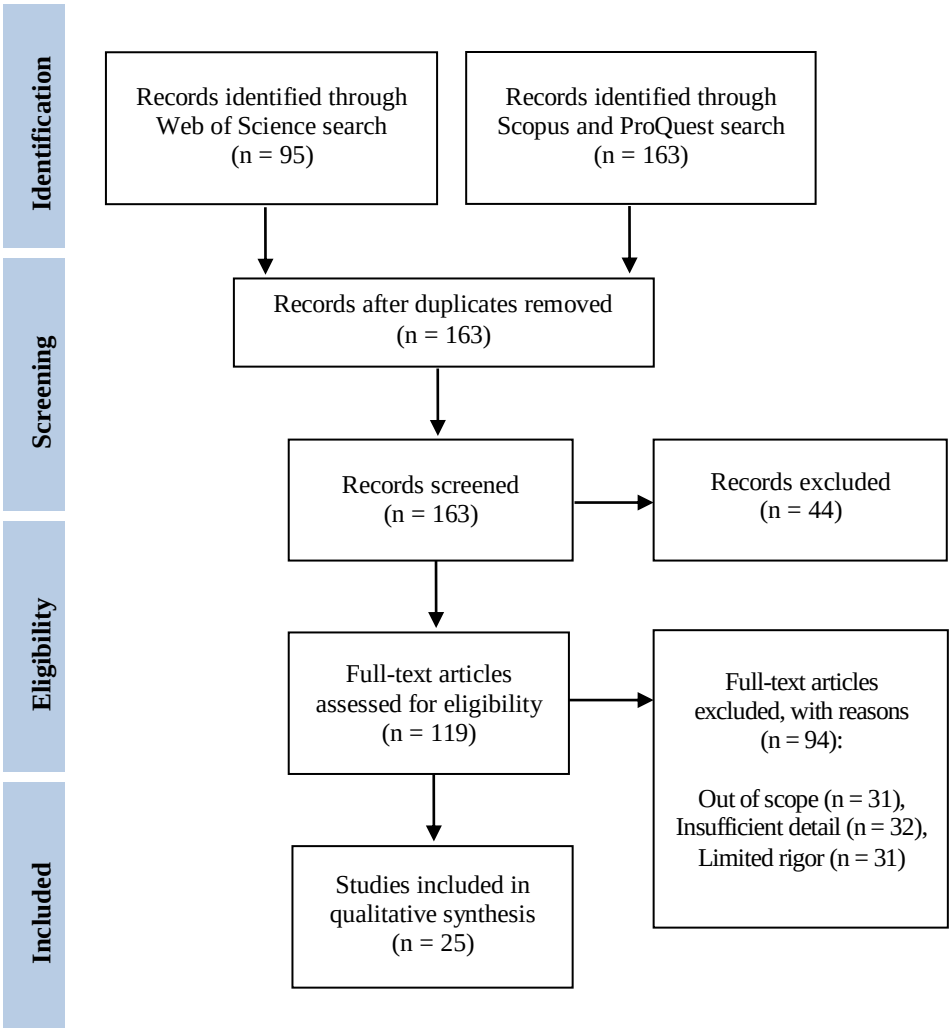


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

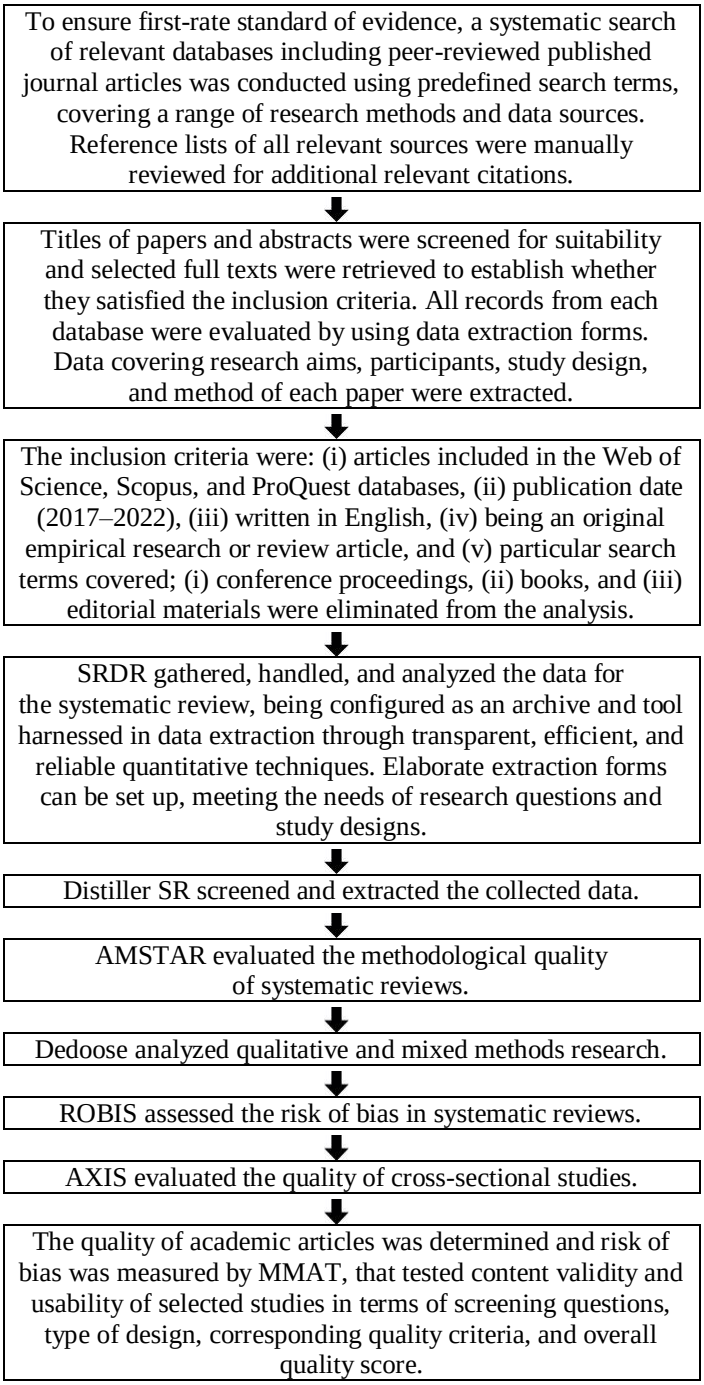


Figure 6 Screening and quality assessment tools

4. Virtual Reality Immersive Technologies and Augmented Reality Beauty Apps

Semantic face editing tools, deep learning techniques, virtual clothing try-ons, and computer-generated imagery (Hsu et al., 2021; Jarzyna, 2021; Luna Mora and Berry, 2021; Millière, 2022; Ponseti et al., 2022; Rodner et al., 2022) configure personality traits and intentional attitudes. Cognitive and affective beliefs, negative thoughts and feelings, and social and emotional needs require virtual reality immersive technologies and augmented reality beauty apps. Visual body appearance, the cultural and symbolic capital of body language, beauty standards and normativity, commoditized beauty management, and body self-objectification optimize digitally modified bodies in terms of beauty ideal internalization.

Photo beautification algorithms, augmented reality try-ons, and beauty apps (Bailey and Burkell, 2021; Hsu et al., 2021; Jarzyna, 2021; Krueger and Osler, 2019; Lavoye et al., 2023; Peng, 2021; Swerzenski, 2021) are instrumental in cognitive and affective processes, negative thoughts and feelings, and visual and haptic imagery. Affective states, negative moods and emotions, and techno-social presence can be attained through beautifying filters. Image alteration technology, photo retouching apps, and airbrushing and brightness filters articulate contextual visual meanings, social exclusion, and emotional intimacy.

Augmented reality technology and digital beauty filters (Elias and Gill, 2017; Krueger and Osler, 2019; Rodner et al., 2022; Thai et al., 2020; Yao et al., 2021) articulate objectified body consciousness, idealized physical appearance, negative evaluations and feelings, body image disturbance, and societal expectations. Beauty apps and virtual makeovers optimize emotional contagion, body dissatisfaction, expressive gestures and movements, and distorted self-perceptions. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Semantic face editing tools, deep learning techniques, virtual clothing try-ons, and computer-generated imagery configure personality traits and intentional attitudes.	Hsu et al., 2021; Jarzyna, 2021; Luna Mora and Berry, 2021; Millière, 2022; Ponseti et al., 2022; Rodner et al., 2022
Photo beautification algorithms, augmented reality try-ons, and beauty apps are instrumental in cognitive and affective processes, negative thoughts and feelings, and visual and haptic imagery.	Bailey and Burkell, 2021; Hsu et al., 2021; Jarzyna, 2021; Krueger and Osler, 2019; Lavoye et al., 2023; Peng, 2021; Swerzenski, 2021
Augmented reality technology and digital beauty filters articulate objectified body consciousness, idealized physical appearance, and negative evaluations and feelings.	Elias and Gill, 2017; Krueger and Osler, 2019; Rodner et al., 2022; Thai et al., 2020; Yao et al., 2021

5. Automated Facial Retouching, Aesthetic and Affective Technologies, and Image Processing Algorithms

Affective and cognitive behaviors, symbolic meanings of social desirability, and negative body image and emotions (Hsu et al., 2021; Jarzyna, 2021; Lavoye et al., 2023; McGill, 2022; Millière, 2022; Tan et al., 2022; Tiggemann, 2022) necessitate augmented virtuality technologies, deep learning-based facial retouching, and body beautification tools. Deep learning-based photorealistic images and mediated beauty tools assist beauty filters in terms of social relationships, meaning and value production, and physical appearances. Visual social networks and sentiment prediction algorithms, body dissatisfaction, visual inconsistencies, and social meaning and engagement configure idealized body images and visual connections on social media.

Deep convolutional neural networks with regard to media-portrayed idealized images (Krueger and Osler, 2019; McGill, 2022; Tiggemann, 2022) are instrumental in body image concerns, normative beauty ideals, standards, and norms, visually discursive practices, image sentiment recognition, appearance-based social comparisons, and shifting emotional states. Negative thoughts and behaviors, coordinated bodily movements, and unrealistic beauty ideals can be achieved through digitally mediated social presence.

Digitally-enhanced photos in terms of facial beautification and attractiveness (Elias and Gill, 2017; Krueger and Osler, 2019; Loke et al., 2020; Luna Mora and Berry, 2021; Simay et al., 2022; Taffel, 2021; Thai et al., 2020; Zhang, 2022) develop on ideal or normative body images, bodily interaction and co-presence, and negative self-esteem. Virtual and augmented reality technologies are pivotal in body aspirations and beauty ideals, physical appearance, and mood modifications. Unattainable physical beauty and strict body measurements develop on automated facial retouching, aesthetic and affective technologies, and image processing algorithms. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Affective and cognitive behaviors, symbolic meanings of social desirability, and negative body image and emotions necessitate augmented virtuality technologies, deep learning-based facial retouching, and body beautification tools.	Hsu et al., 2021; Jarzyna, 2021; Lavoye et al., 2023; McGill, 2022; Millière, 2022; Tan et al., 2022; Tiggemann, 2022
Deep convolutional neural networks with regard to media-portrayed idealized images are instrumental in body image concerns.	Krueger and Osler, 2019; McGill, 2022; Tiggemann, 2022
Digitally-enhanced photos in terms of facial beautification and attractiveness develop on ideal or normative body images, bodily interaction and co-presence, and negative self-esteem.	Elias and Gill, 2017; Krueger and Osler, 2019; Loke et al., 2020; Luna Mora and Berry, 2021; Simay et al., 2022; Taffel, 2021; Thai et al., 2020; Zhang, 2022

6. Idealized Social Media Images, Digital Self-Expression and Representations, Normative Beauty, and Multimodal Emotional Expressions

Experiential augmented reality apps, image beautification tools, and facial recognition algorithms (Bailey and Burkell, 2021; Hsu et al., 2021; Jarzyna, 2021; Lavoye et al., 2023; Millière, 2022; Peng, 2021; Swerzenski, 2021; Wang, 2020) are pivotal in affective and cognitive experiences, negative emotions and behaviors, and virtual body representation. Deep learning algorithms and visual data enable attractive physical features. Visual content and image editing tools assist image retouching and photo editing apps in terms of socio-technological processes.

Augmented reality beauty apps and filters (Elias and Gill, 2017; Krueger and Osler, 2019; Lavoye et al., 2023; Ota and Nakano, 2021; Thai et al., 2020; Wu, 2021) configure affective and cognitive feelings, facial retouching behaviors, and perceived facial attractiveness. Digital self-monitoring and self-tracking shape bodily affective styles, appearance dissatisfaction, and emotional experiences and expressions.

Cognitive and affective engagement, social comparisons, and negative body image and self-esteem (Hsu et al., 2021; Jarzyna, 2021; McGill, 2022; Mihăilă and Branișțe, 2021; Rodner et al., 2022; Tiggemann, 2022; Yao et al., 2021) integrate augmented reality immersive and motion sensing technologies in terms of realistically unattainable beauty standards. Idealized social media images, digital self-expression and representations, normative beauty, and multimodal emotional expressions necessitate beauty apps. Unattainable beauty image and body standards can be attained through real-time body modification technologies in terms of aesthetic and emotional visuality and negative body image. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Experiential augmented reality apps, image beautification tools, and facial recognition algorithms are pivotal in affective and cognitive experiences, negative emotions and behaviors, and virtual body representation.	Bailey and Burkell, 2021; Hsu et al., 2021; Jarzyna, 2021; Lavoye et al., 2023; Millière, 2022; Peng, 2021; Swerzenski, 2021; Wang, 2020
Augmented reality beauty apps and filters configure affective and cognitive feelings, facial retouching behaviors, and perceived facial attractiveness.	Elias and Gill, 2017; Krueger and Osler, 2019; Lavoye et al., 2023; Ota and Nakano, 2021; Thai et al., 2020; Wu, 2021
Cognitive and affective engagement, social comparisons, and negative body image and self-esteem integrate augmented reality immersive and motion sensing technologies in terms of realistically unattainable beauty standards.	Hsu et al., 2021; Jarzyna, 2021; McGill, 2022; Mihăilă and Branișțe, 2021; Rodner et al., 2022; Tiggemann, 2022; Yao et al., 2021

7. Discussion

We integrate our systematic review throughout research indicating how image alteration technology, photo retouching apps, and airbrushing and brightness filters articulate contextual visual meanings, social exclusion, and emotional intimacy. Our research complements recent analyses clarifying how visual social networks and sentiment prediction algorithms, body dissatisfaction, visual inconsistencies, and social meaning and engagement configure idealized body images and visual connections on social media. We elucidate, by cumulative evidence, previous research demonstrating how cognitive and affective beliefs, negative thoughts and feelings, and social and emotional needs require virtual reality immersive technologies and augmented reality beauty apps.

8. Synopsis of the Main Research Outcomes

Digital self-monitoring and self-tracking shape bodily affective styles, appearance dissatisfaction, and emotional experiences and expressions. Negative thoughts and behaviors, coordinated bodily movements, and unrealistic beauty ideals can be achieved through digitally mediated social presence. Deep learning-based photorealistic images and mediated beauty tools assist beauty filters in terms of social relationships, meaning and value production, and physical appearances.

9. Conclusions

Relevant research has investigated whether beauty apps and virtual makeovers optimize emotional contagion, body dissatisfaction, expressive gestures and movements, and distorted self-perceptions. This systematic literature review presents the published peer-reviewed sources covering how visual body appearance, the cultural and symbolic capital of body language, beauty standards and normativity, commoditized beauty management, and body self-objectification optimize digitally modified bodies in terms of beauty ideal internalization. The research outcomes drawn from the above analyses indicate that unattainable physical beauty and strict body measurements develop on automated facial retouching, aesthetic and affective technologies, and image processing algorithms.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published in journals indexed in the Web of Science, Scopus, and ProQuest databases between 2017 and 2022, relevant sources on augmented reality beauty apps for idealized facial and bodily appearances in terms of low self-esteem and self-image, cognitive and af-

fective engagement, and negative emotional states may have been excluded. The scope of our study also does not move forward the inspection of semantic face editing tools, deep learning techniques, virtual clothing try-ons, and computer-generated imagery.

Subsequent analyses should develop on photo beautification algorithms, augmented reality try-ons, and beauty apps. Future research should thus investigate deep convolutional neural networks with regard to media-portrayed idealized images. Attention should be directed to augmented reality immersive and motion sensing technologies in terms of realistically unattainable beauty standards.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the authors. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

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All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication. The authors take full responsibility for the accuracy and the integrity of the data analysis.

Conflict of interest statement
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Disclosure by the editors of record
The editors declare no conflict of interest in the review and publication decision regarding this article.

Transparency statement
The authors affirm that the manuscript represents an honest, accurate, and transparent account of the research being reported, that no relevant aspects of the study have been left out, and that any inconsistencies from the research as planned (and, if significant, registered) have been clarified.

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Augmented Reality Beauty Apps for Physical Appearance and Attractiveness: Face and Body Emotion Recognition Processes, Negative Mood and Self-Esteem, and Appealing Self-Presentation

James Perkins*

ABSTRACT. Based on an in-depth survey of the literature, the purpose of the paper is to explore filtered and photoshopped faces and bodies, aesthetically appealing images, and face and body emotion recognition processes. In this research, previous findings were cumulated showing that try-on surgery filters enable unrealistic beauty ideals, body image comparisons, perceived facial and body imperfections, digital body transformation, and digitized social interactions, and I contribute to the literature by indicating that photo editing apps and face beautification tools enable sociocultural processes and contexts, selfie-taking behaviors, and body image concerns. Throughout June 2022, I performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "augmented reality beauty apps for physical appearance and attractiveness" + "face and body emotion recognition processes," "negative mood and self-esteem," and "appealing self-presentation." As I inspected research published between 2017 and 2022, only 167 articles satisfied the eligibility criteria. By removing controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, I decided upon 38, generally empirical, sources. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, MMAT, and SRDR.

Keywords: augmented reality beauty app; physical appearance and attractiveness; face and body emotion recognition process; negative mood and self-esteem; appealing self-presentation

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1. Introduction

Social privileges, norms, and practices, visual content and representations, appearance anxieties, and physical attractiveness ideals shape beauty standards and norms. The purpose of my systematic review is to examine the recently published literature on face and body emotion recognition processes, negative mood and self-esteem, and appealing self-presentation and integrate the insights it configures on augmented reality beauty apps for physical appearance and attractiveness. By analyzing the most recent (2017–2022) and significant (Web of Science, Scopus, and ProQuest) sources, my paper has attempted to prove that beauty apps configure visual and digital practices in terms of idealized social media appearance-focused images, unfavorable appearance comparisons, and negative emotions and feelings. The actuality and novelty of this study are articulated by addressing filtered and photoshopped faces and bodies, aesthetically appealing images, and face and body emotion recognition processes, that is an emerging topic involving much interest. My research problem is whether synthetic social networks articulate behavioral intentions, body image disturbance, social image and prestige, and poor appearance satisfaction in terms of visually appealing body images.

In this review, prior findings have been cumulated indicating that beauty ideals, standards, norms, and imagery require networked social practices. The identified gaps advance filtered attractiveness and digital interactive behaviors. My main objective is to indicate that emotion sensing technologies (Andronie et al., 2021a, b, c) optimize social media-based self-perception, mood and image manipulation, nonverbal messages, and impression management. This systematic review contributes to the literature on unrealistic beauty standards in visual media cultures by clarifying that try-on surgery filters enable unrealistic beauty ideals, body image comparisons, perceived facial and body imperfections, digital body transformation, and digitized social interactions. This research endeavors to elucidate whether facial recognition systems further visually appealing self-presentations, algorithmic sociality (Andronie et al., 2023; Nagy and Lăzăroiu, 2022), and low self-esteem. My contribution is by integrating research findings indicating that photo editing apps and face beautification tools enable socio-cultural processes and contexts, selfie-taking behaviors, and body image concerns.

2. Theoretical Overview of the Main Concepts

Cosmetically-enhanced beauty ideals, social practices, visible self-transformation values, monitored body appearance and behaviors, and idealized self-actualization practices shape photo-editing language and meanings. Beauty filters configure social comparisons, negative behaviors and sentiments, perceived enjoyment and value, and body image concerns in relation

to idealized appearance and imagery. Low self-esteem and self-image require beautifying face filters with reference to physical appearance and attractiveness. Beauty filters enable symbolic meanings of the unrealistic nature of body images with reference to self-presentation authenticity fashionable facial ideals. The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), idealized social media appearance-focused images, unfavorable appearance comparisons, and negative emotions and feelings (section 4), unrealistic beauty standards in visual media cultures (section 5), visually appealing self-presentations, algorithmic sociality, and low self-esteem (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout June 2022, I performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "augmented reality beauty apps for physical appearance and attractiveness" + "face and body emotion recognition processes," "negative mood and self-esteem," and "appealing self-presentation." As I inspected research published between 2017 and 2022, only 167 articles satisfied the eligibility criteria. By removing controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, I decided upon 38, generally empirical, sources (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, MMAT, and SRDR (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
augmented reality beauty apps for physical appearance and attractiveness + face and body emotion recognition processes	58	14
augmented reality beauty apps for physical appearance and attractiveness + negative mood and self-esteem	56	13
augmented reality beauty apps for physical appearance and attractiveness + appealing self-presentation	53	11
Type of paper		
Original research	145	37
Review	7	1
Conference proceedings	11	0
Book	2	0
Editorial	2	0

Source: Processed by the author. Some topics overlap.

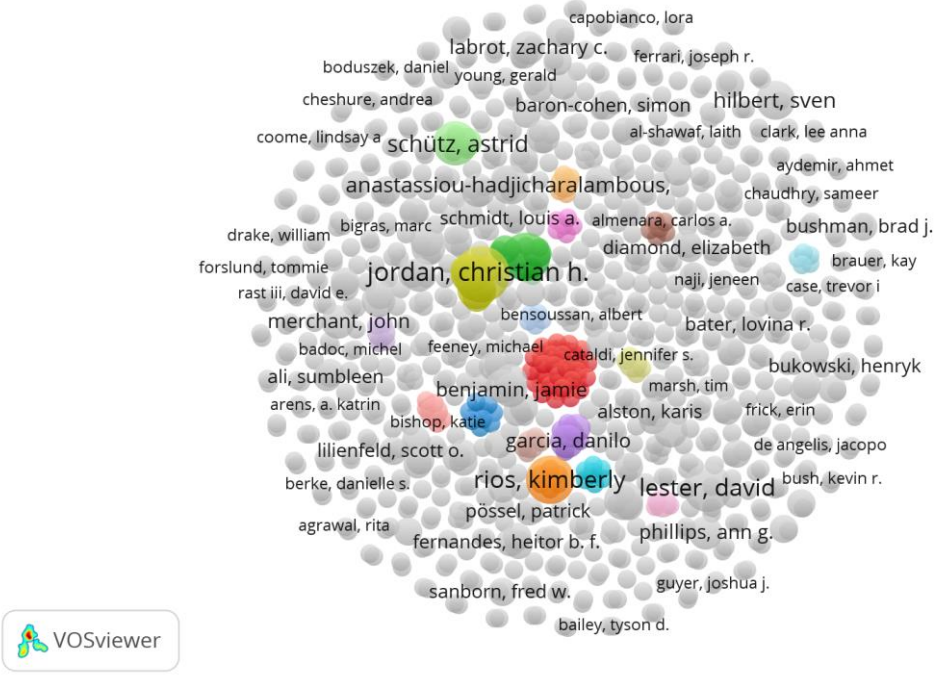


Figure 1 Co-authorship

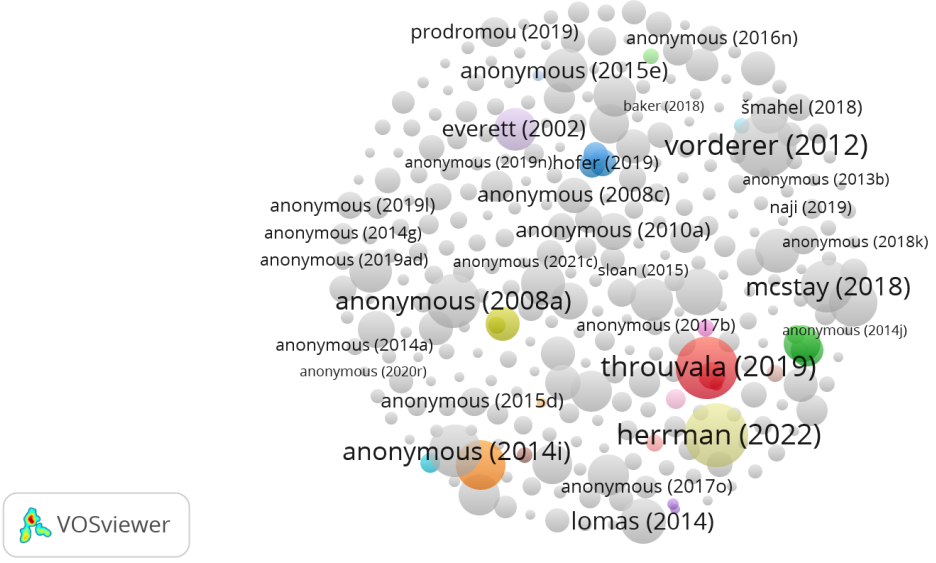


Figure 2 Citation

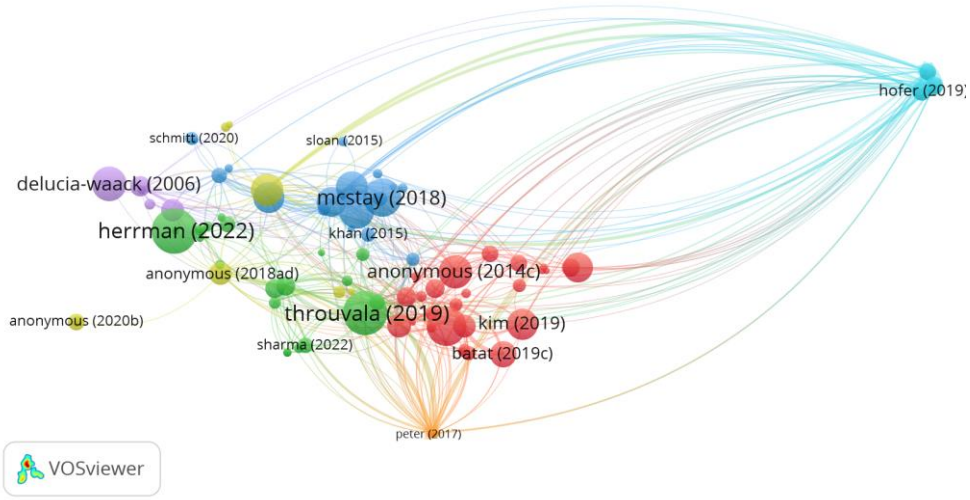


Figure 3 Bibliographic coupling

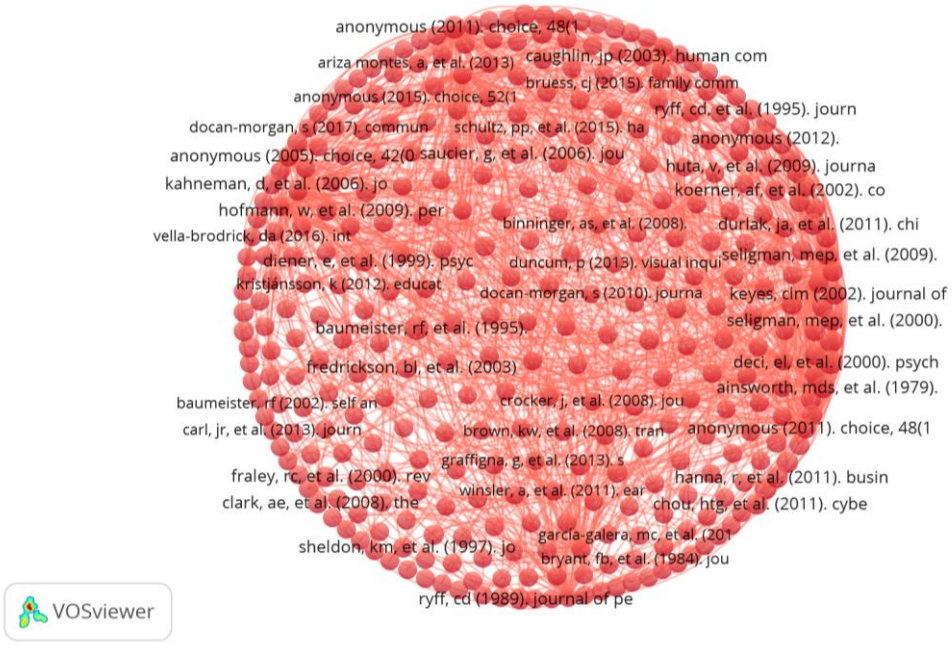


Figure 4 Co-citation

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings).

State body dissatisfaction, negative self-esteem, and emotional intimacy necessitate augmented reality body and face filters in respect of social motivations, cultural norms and codes, and digitally manipulated visual narratives.	Lim and Bentley, 2022; Maes and de Lenne, 2022; Mulgrew and Courtney, 2022; Palash et al., 2022; Peng, 2021; Qutub, 2021
Image editing tools enable negative mood, self-esteem, and psychological well-being, body dissatisfaction, and perceived social support in terms of unrealistic beauty ideals.	Butkowski et al., 2022; Evans, 2023; Findlay, 2019; Paxton et al., 2022; Rodgers et al., 2022; Staniewski and Awruk, 2022; Yang, 2022
Virtual makeover/try-on apps are instrumental in facial dissatisfaction, negative psychological states and behaviors, and negative body image with respect to enhanced facial and body appearance and idealized bodies.	Eriksson and Kenalemang, 2023; Findlay, 2019; Hedman et al., 2022; Lavrence and Cambre, 2020; Peng, 2021; Pescott, 2020; Wang et al., 2019; Zhang, 2022
Body-image and -beautification practices, negative psychological well-being, social values and norms, and digital bodily interventions can be attained through immersive virtual reality technology.	Chow, 2022; Lim and Bentley, 2022; Luna Mora and Berry, 2021; Mulgrew and Courtney, 2022; Palash et al., 2022; Rodner et al., 2022; Zhao and Zappavigna, 2018
Inauthentic social performance and impression management can be achieved through beauty filters and photo editing tools in connection with modified bodily features, negative emotions, and social interactions.	Barker, 2020; Butkowski et al., 2022; Felig and Goldenberg, 2023; Foster and Baker, 2022; Staniewski and Awruk, 2022; Yang, 2022
Beauty apps optimize digital social practices, negative emotions, self-presentation perceptions and behaviors, and aesthetically pleasing appearance with regard to unrealistic beauty standards.	Degen and Kleeberg-Niepage, 2023; Glapka, 2022; Kuipers, 2022; Pescott, 2020; Rodríguez-Fuertes et al., 2022; Tawira and Ivanov, 2023
Thin-ideal imagery assists meaningful social connections with regard to beauty and appearance ideals, negative mood and behavioral beliefs, and positive body image.	Lim and Bentley, 2022; Mihăilă and Braniște, 2021; Millière, 2022; Wang, 2020; Mulgrew and Courtney, 2022; Palash et al., 2022
Unrealistic beauty images, socially constituted norms, negative self-image, defining beauty ideals, and visual aesthetics require filtered attractiveness and digital interactive behaviors.	Barker, 2020; Degen and Kleeberg-Niepage, 2023; Felig and Goldenberg, 2023; Foster and Baker, 2022; Kuipers, 2022; Rodner et al., 2022; Tawira and Ivanov, 2023; Yao et al., 2021
Filtered and photoshopped faces and bodies, aesthetically appealing images, and face and body emotion recognition processes can be attained through augmented reality beauty apps and immersive and interactive technologies.	Butt et al., 2022; Gill, 2017; Peng and Gu, 2021; Sun, 2021; Whang et al., 2021; Zhao and Zappavigna, 2018

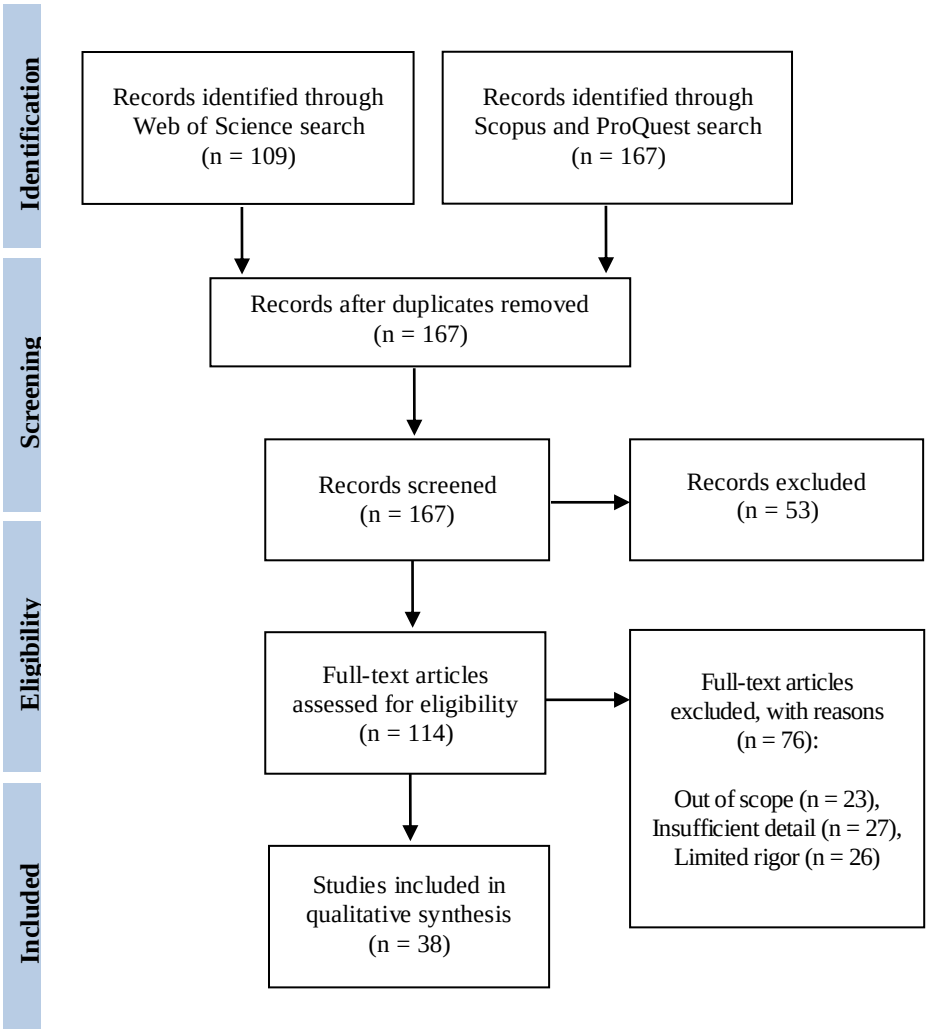


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

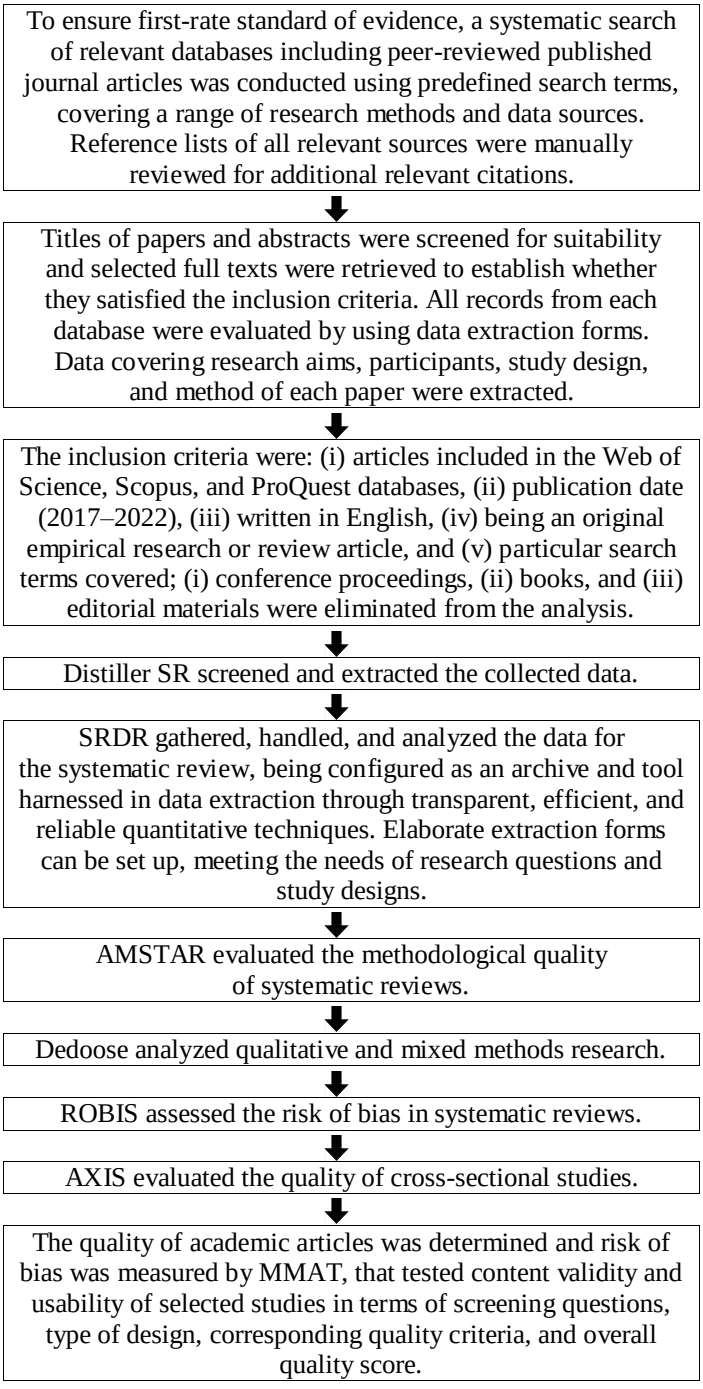


Figure 6 Screening and quality assessment tools

4. Idealized Social Media Appearance-focused Images, Unfavorable Appearance Comparisons, and Negative Emotions and Feelings

State body dissatisfaction, negative self-esteem, and emotional intimacy (Lim and Bentley, 2022; Maes and de Lenne, 2022; Mulgrew and Courtney, 2022; Palash et al., 2022; Peng, 2021; Qutub, 2021) necessitate augmented reality body and face filters in respect of social motivations, cultural norms and codes, and digitally manipulated visual narratives. Beauty filters configure social comparisons, negative behaviors and sentiments, perceived enjoyment and value, and body image concerns in relation to idealized appearance and imagery.

Image editing tools enable negative mood, self-esteem, and psychological well-being, body dissatisfaction, and perceived social support (Butkowski et al., 2022; Evans, 2023; Findlay, 2019; Paxton et al., 2022; Rodgers et al., 2022; Staniewski and Awruk, 2022; Yang, 2022) in terms of unrealistic beauty ideals. Beauty apps configure visual and digital practices in terms of idealized social media appearance-focused images, unfavorable appearance comparisons, and negative emotions and feelings. Beauty filters enable symbolic meanings of the unrealistic nature of body images with reference to self-presentation authenticity fashionable facial ideals.

Virtual makeover/try-on apps are instrumental in facial dissatisfaction, negative psychological states and behaviors, and negative body image (Eriksson and Kenalemang, 2023; Findlay, 2019; Hedman et al., 2022; Lavrence and Cambre, 2020; Peng, 2021; Pescott, 2020; Wang et al., 2019; Zhang, 2022) with respect to enhanced facial and body appearance and idealized bodies. Beauty ideals, standards, norms, and imagery require networked social practices. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

State body dissatisfaction, negative self-esteem, and emotional intimacy necessitate augmented reality body and face filters in respect of social motivations, cultural norms and codes, and digitally manipulated visual narratives.	Lim and Bentley, 2022; Maes and de Lenne, 2022; Mulgrew and Courtney, 2022; Palash et al., 2022; Peng, 2021; Qutub, 2021
Image editing tools enable negative mood, self-esteem, and psychological well-being, body dissatisfaction, and perceived social support in terms of unrealistic beauty ideals.	Butkowski et al., 2022; Evans, 2023; Findlay, 2019; Paxton et al., 2022; Rodgers et al., 2022; Staniewski and Awruk, 2022; Yang, 2022
Virtual makeover/try-on apps are instrumental in facial dissatisfaction, negative psychological states and behaviors, and negative body image with respect to enhanced facial and body appearance and idealized bodies.	Eriksson and Kenalemang, 2023; Findlay, 2019; Hedman et al., 2022; Lavrence and Cambre, 2020; Peng, 2021; Pescott, 2020; Wang et al., 2019; Zhang, 2022

5. Unrealistic Beauty Standards in Visual Media Cultures

Body-image and -beautification practices, negative psychological well-being, social values and norms, and digital bodily interventions (Chow, 2022; Lim and Bentley, 2022; Luna Mora and Berry, 2021; Mulgrew and Courtney, 2022; Palash et al., 2022; Rodner et al., 2022; Zhao and Zappavigna, 2018) can be attained through immersive virtual reality technology. Synthetic social networks articulate behavioral intentions, body image disturbance, social image and prestige, and poor appearance satisfaction in terms of visually appealing body images. Cosmetically-enhanced beauty ideals, social practices, visible self-transformation values, monitored body appearance and behaviors, and idealized self-actualization practices shape photo-editing language and meanings.

Inauthentic social performance and impression management can be achieved through beauty filters and photo editing tools (Barker, 2020; Butkowski et al., 2022; Felig and Goldenberg, 2023; Foster and Baker, 2022; Staniewski and Awruk, 2022; Yang, 2022) in connection with modified bodily features, negative emotions, social interactions, symbolic meanings, and body movements. Social privileges, norms, and practices, visual content and representations, appearance anxieties, and physical attractiveness ideals shape beauty standards and norms.

Beauty apps optimize digital social practices, negative emotions, self-presentation perceptions and behaviors, and aesthetically pleasing appearance (Degen and Kleeberg-Niepage, 2023; Glapka, 2022; Kuipers, 2022; Pescott, 2020; Rodríguez-Fuertes et al., 2022; Tawira and Ivanov, 2023) with regard to unrealistic beauty standards in visual media cultures. Emotion sensing technologies optimize social media-based self-perception, mood and image manipulation, nonverbal messages, and impression management. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Body-image and -beautification practices, negative psychological well-being, social values and norms, and digital bodily interventions can be attained through immersive virtual reality technology.	Chow, 2022; Lim and Bentley, 2022; Luna Mora and Berry, 2021; Mulgrew and Courtney, 2022; Palash et al., 2022; Rodner et al., 2022; Zhao and Zappavigna, 2018
Inauthentic social performance and impression management can be achieved through beauty filters and photo editing tools in connection with modified bodily features, negative emotions, and social interactions.	Barker, 2020; Butkowski et al., 2022; Felig and Goldenberg, 2023; Foster and Baker, 2022; Staniewski and Awruk, 2022; Yang, 2022
Beauty apps optimize digital social practices, negative emotions, self-presentation perceptions and behaviors, and aesthetically pleasing appearance with regard to unrealistic beauty standards.	Degen and Kleeberg-Niepage, 2023; Glapka, 2022; Kuipers, 2022; Pescott, 2020; Rodríguez-Fuertes et al., 2022; Tawira and Ivanov, 2023

6. Visually Appealing Self-Presentations, Algorithmic Sociality, and Low Self-Esteem

Thin-ideal imagery assists meaningful social connections (Lim and Bentley, 2022; Mihăilă and Branişte, 2021; Millière, 2022; Wang, 2020; Mulgrew and Courtney, 2022; Palash et al., 2022) with regard to beauty and appearance ideals, negative mood and behavioral beliefs, and positive body image. Facial recognition systems further visually appealing self-presentations, algorithmic sociality, and low self-esteem.

Unrealistic beauty images, socially constituted norms, negative self-image, defining beauty ideals, and visual aesthetics (Barker, 2020; Degen and Kleeberg-Niepage, 2023; Felig and Goldenberg, 2023; Foster and Baker, 2022; Kuipers, 2022; Rodner et al., 2022; Tawira and Ivanov, 2023; Yao et al., 2021) require filtered attractiveness and digital interactive behaviors. Low self-esteem and self-image require beautifying face filters with reference to physical appearance and attractiveness. Try-on surgery filters enable unrealistic beauty ideals, body image comparisons, perceived facial and body imperfections, digital body transformation, and digitized social interactions.

Filtered and photoshopped faces and bodies, aesthetically appealing images, and face and body emotion recognition processes (Butt et al., 2022; Gill, 2017; Peng and Gu, 2021; Sun, 2021; Whang et al., 2021; Zhao and Zappavigna, 2018) can be attained through augmented reality beauty apps and immersive and interactive technologies. Photo editing apps and face beautification tools enable socio-cultural processes and contexts, selfie-taking behaviors, and body image concerns. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Thin-ideal imagery assists meaningful social connections with regard to beauty and appearance ideals, negative mood and behavioral beliefs, and positive body image.	Lim and Bentley, 2022; Mihăilă and Branişte, 2021; Millière, 2022; Wang, 2020; Mulgrew and Courtney, 2022; Palash et al., 2022
Unrealistic beauty images, socially constituted norms, negative self-image, defining beauty ideals, and visual aesthetics require filtered attractiveness and digital interactive behaviors.	Barker, 2020; Degen and Kleeberg-Niepage, 2023; Felig and Goldenberg, 2023; Foster and Baker, 2022; Kuipers, 2022; Rodner et al., 2022; Tawira and Ivanov, 2023; Yao et al., 2021
Filtered and photoshopped faces and bodies, aesthetically appealing images, and face and body emotion recognition processes can be attained through augmented reality beauty apps and immersive and interactive technologies.	Butt et al., 2022; Gill, 2017; Peng and Gu, 2021; Sun, 2021; Whang et al., 2021; Zhao and Zappavigna, 2018

7. Discussion

I integrate my systematic review throughout research indicating how emotion sensing technologies optimize social media-based self-perception, mood and image manipulation, nonverbal messages, and impression management. My research complements recent analyses clarifying how cosmetically-enhanced beauty ideals, social practices, visible self-transformation values, monitored body appearance and behaviors, and idealized self-actualization practices shape photo-editing language and meanings. I elucidate, by cumulative evidence, previous research demonstrating how synthetic social networks articulate behavioral intentions, body image disturbance, social image and prestige, and poor appearance satisfaction in terms of visually appealing body images.

8. Synopsis of the Main Research Outcomes

Beauty apps configure visual and digital practices in terms of idealized social media appearance-focused images, unfavorable appearance comparisons, and negative emotions and feelings. Facial recognition systems further visually appealing self-presentations, algorithmic sociality, and low self-esteem. Beauty filters configure social comparisons, negative behaviors and sentiments, perceived enjoyment and value, and body image concerns in relation to idealized appearance and imagery. Low self-esteem and self-image require beautifying face filters with reference to physical appearance and attractive-ness. Beauty ideals, standards, norms, and imagery require networked social practices.

9. Conclusions

Relevant research has investigated whether beauty filters enable symbolic meanings of the unrealistic nature of body images with reference to self-presentation authenticity fashionable facial ideals. This systematic literature review presents the published peer-reviewed sources covering how try-on surgery filters enable unrealistic beauty ideals, body image comparisons, perceived facial and body imperfections, digital body transformation, and digitized social interactions. The research outcomes drawn from the above analyses indicate that social privileges, norms, and practices, visual content and representations, appearance anxieties, and physical attractiveness ideals shape beauty standards and norms.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published in journals indexed in the Web of Science, Scopus, and ProQuest databases between 2017 and 2022, relevant

sources on augmented reality beauty apps for physical appearance and attractiveness in terms of face and body emotion recognition processes, negative mood and self-esteem, and appealing self-presentation may have been excluded. The scope of my study also does not move forward the inspection of image editing tools enabling negative mood, self-esteem, and psychological well-being, body dissatisfaction, and perceived social support.

Subsequent analyses should develop on inauthentic social performance and impression management achieved through beauty filters and photo editing tools. Future research should thus investigate unrealistic beauty images, socially constituted norms, negative self-image, defining beauty ideals, and visual aesthetics. Attention should be directed to augmented reality beauty apps and immersive and interactive technologies.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the author. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

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The author confirms being the sole contributor of this work and approved it for publication. The author takes full responsibility for the accuracy and the integrity of the data analysis.

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Transparency statement
The author affirms that the manuscript represents an honest, accurate, and transparent account of the research being reported, that no relevant aspects of the study have been left out, and that any inconsistencies from the research as planned (and, if significant, registered) have been clarified.

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Augmented Reality Face Filters for Unrealistic Physical Appearance and Beauty Images: Contextual Visual Meanings, Negative Thoughts and Behaviors, and Social Interactions and Comparisons

Ramona Mihăilă*

ABSTRACT. In this article, I cumulate previous research findings indicating that social traits and behaviors, thin-idealized beauty, body-image affective judgments, and unrealistic physical appearance develop on digitally networked images and biometric data. I contribute to the literature on normative beauty standards, idealized and unrealistic body imagery, media-induced body dissatisfaction, digital self-expression, and digital self-representation by showing that idealized appearance-focused media and edited and retouched images optimize emotional wellbeing, beauty ideal internalization, and social expectations and pressures. Throughout May 2022, I performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "augmented reality face filters for unrealistic physical appearance and beauty images" + "contextual visual meanings," "negative thoughts and behaviors," and "social interactions and comparisons." As I inspected research published between 2017 and 2022, only 162 articles satisfied the eligibility criteria. By removing controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, I decided upon 33, generally empirical, sources. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, MMAT, and SRDR.

Keywords: augmented reality face filters; unrealistic physical appearance and beauty image; contextual visual meaning; negative thought and behaviour; social interaction and comparison

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1. Introduction

Digital self-representational media articulate unattainable sociocultural appearance ideals and unrealistically ideal body images. The purpose of my systematic review is to examine the recently published literature on contextual visual meanings (Andronie et al., 2021a, b; Lăzăroiu et al., 2022), negative thoughts and behaviors, and social interactions and comparisons and integrate the insights it configures on augmented reality face filters for unrealistic physical appearance and beauty images. By analyzing the most recent (2017–2022) and significant (Web of Science, Scopus, and ProQuest) sources, my paper has attempted to prove that beauty filters and virtual makeup require online self-presentation in relation to body aestheticization and self-expression, facial feature and aesthetic body enhancements, and low confidence levels.. The actuality and novelty of this study are articulated by addressing normative beauty standards, idealized and unrealistic body imagery, media-induced body dissatisfaction, digital self-expression, and digital self-representation, that is an emerging topic involving much interest. My research problem is whether social traits and behaviors, thin-idealized beauty, body-image affective judgments, and unrealistic physical appearance develop on digitally networked images (Andronie et al., 2023; Nagy et al., 2023) and biometric data.

In this review, prior findings have been cumulated indicating that impression and appearance management can be achieved through augmented reality virtual try-on tools and makeup apps and filters. The identified gaps advance unrealistic beauty ideals, body dissatisfaction, mood and image manipulation, and social comparisons. My main objective is to indicate that digital self-actualization of aesthetic body ideals and standards develop on symbolic social boundaries, body gestures and movements, physical attributes and appearance, and psychological worries and anxieties. This systematic review contributes to the literature on body performance and presentation, social comparisons, unrealistic body images and self-esteem, digitally visible selves, and thin beauty ideals by clarifying that idealized appearance-focused media and edited and retouched images optimize emotional wellbeing, beauty ideal internalization, and social expectations and pressures. This research endeavors to elucidate whether appearance-enhancement apps, augmented reality face filters, and virtual try-ons are instrumental in idealized bodies and behavioral intentions. My contribution is by integrating research findings indicating that social media image filters are instrumental in perceived popularity, thin beauty ideals, social media-based identity formation, and impression management.

2. Theoretical Overview of the Main Concepts

Social media-based self-perception configures body image disturbance, objectified body consciousness, ideal body image standards, and social compar-

isons. Commonly shared appearance ideals and media representations of beauty optimize aesthetic visibility of social connections, negative self-esteem, and body dissatisfaction and shame in visual and virtual cultures. The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), idealized appearance-focused media and edited and retouched images (section 4), social traits and behaviors, thin-idealized beauty, body-image affective judgments, and unrealistic physical appearance (section 5), appearance-enhancement apps, augmented reality face filters, and virtual try-ons (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout May 2022, I performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "augmented reality face filters for unrealistic physical appearance and beauty images" + "contextual visual meanings," "negative thoughts and behaviors," and "social interactions and comparisons." As I inspected research published between 2017 and 2022, only 162 articles satisfied the eligibility criteria. By removing controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, I decided upon 33, generally empirical, sources (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, MMAT, and SRDR (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
augmented reality face filters for unrealistic physical appearance and beauty images + contextual visual meanings	57	12
augmented reality face filters for unrealistic physical appearance and beauty images + negative thoughts and behaviors	55	11
augmented reality face filters for unrealistic physical appearance and beauty images + social interactions and comparisons	50	10
Type of paper		
Original research	140	33
Review	7	0
Conference proceedings	11	0
Book	2	0
Editorial	2	0

Source: Processed by the author. Some topics overlap.

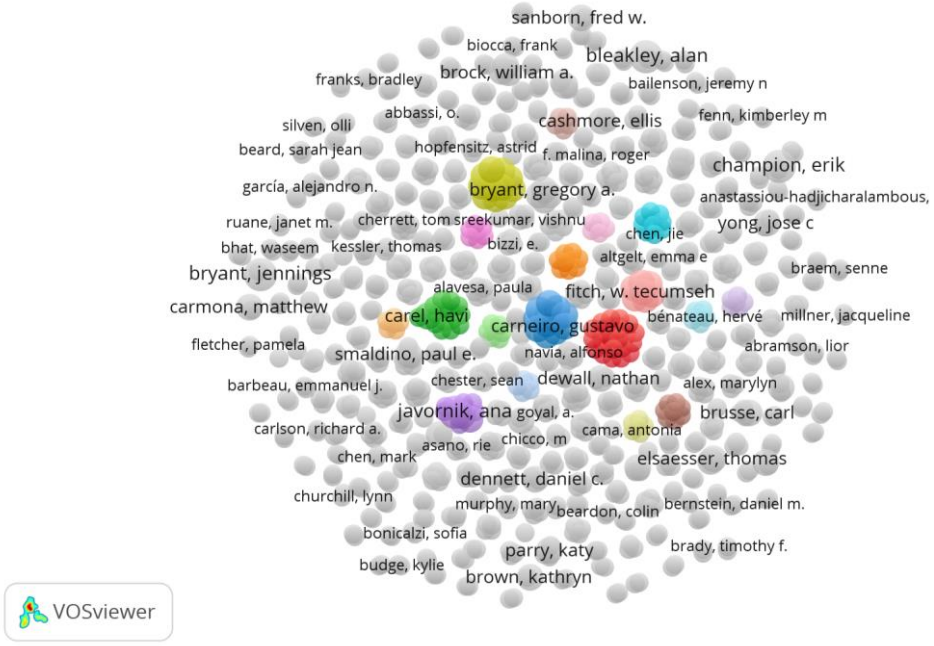


Figure 1 Co-authorship

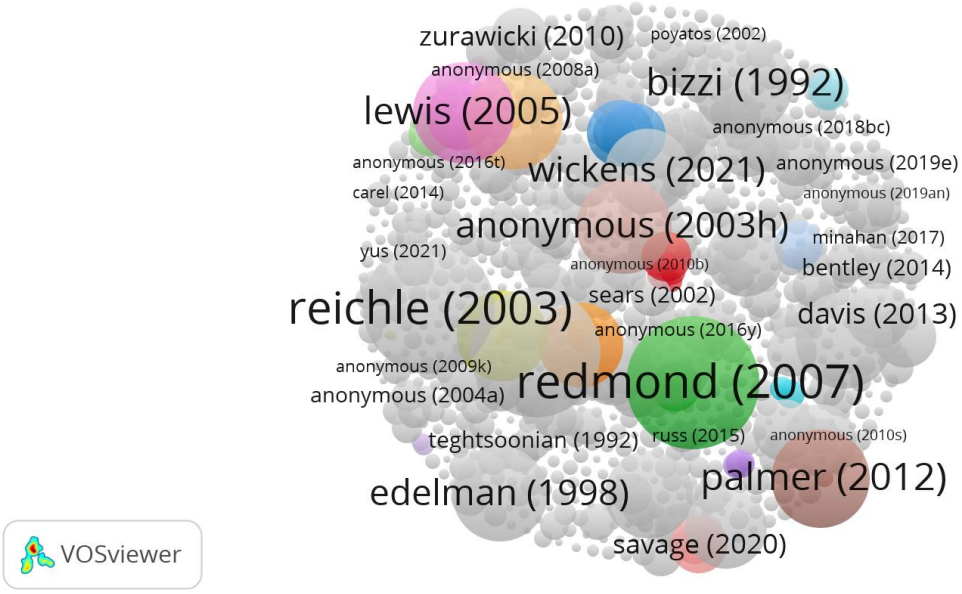


Figure 2 Citation

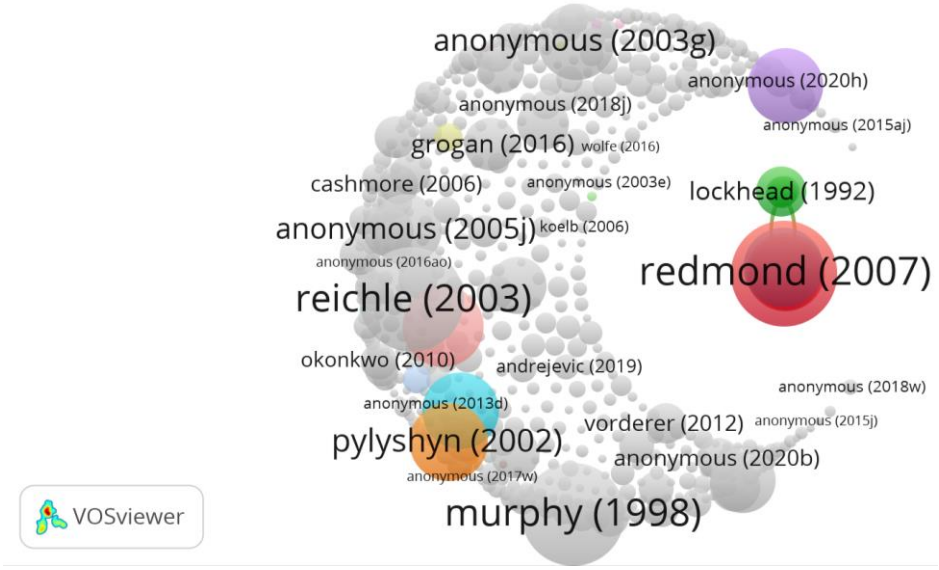


Figure 3 Bibliographic coupling

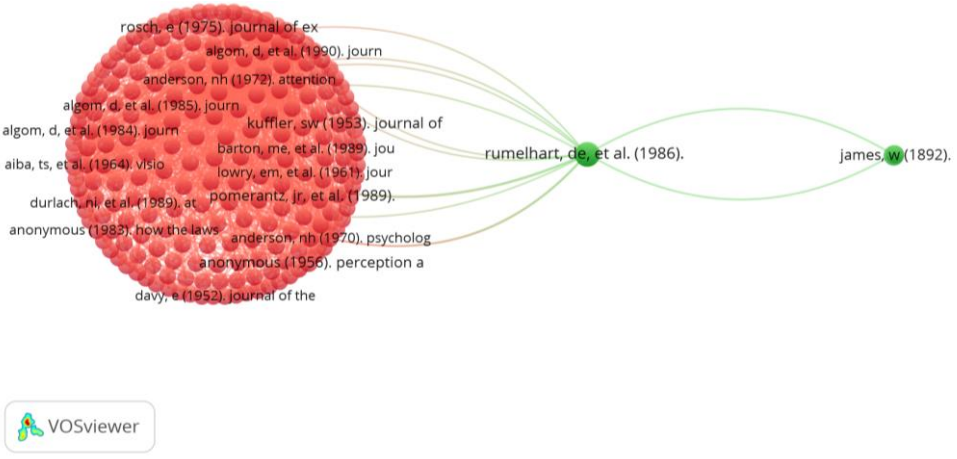


Figure 4 Co-citation

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings).

Visual and discursive data assist augmented reality beauty apps with regard to body performance and presentation, social comparisons, unrealistic body images and self-esteem, digitally visible selves, and thin beauty ideals.	Elias and Gill, 2017; Findlay, 2019; Rodgers et al., 2022; Rodner et al., 2022; Wang, 2020; Yao et al., 2021; Zhang, 2022
Machine learning algorithms, in relation to unrealistic and negative body images and self-esteem, articulate unrealistic beauty ideals, and social comparisons.	Barker, 2020; Felig and Goldenberg, 2023; Foster and Baker, 2022; Yao et al., 2021
Aesthetic self-objectification, body postures and gesticulation, social media-based identity formation, visual interpersonal communication, and negative emotions and body image can be achieved through facial recognition technologies.	Evans, 2023; Glapka, 2022; Hedman et al., 2022; Paxton et al., 2022; Pescott, 2020; Rodgers et al., 2022; Rodríguez-Fuertes et al., 2022; Yao et al., 2021
Normative beauty standards, idealized and unrealistic body imagery, media-induced body dissatisfaction, digital self-expression, and digital self-representation require self-editing software.	Evans, 2023; McGill, 2022; Tiggemann, 2022; Zhang, 2022; Zhao and Zappavigna, 2018
Digital self-actualization in terms of commoditized beauty management enables symbolic social boundaries, body aestheticization and self-expression, physical attributes and appearance, and photo-editing language and meanings.	Eriksson and Kenalemang, 2023; Luna Mora and Berry, 2021; Peng, 2021; Simay et al., 2022; Wang et al., 2019
Visual knowledge sharing practices, appearance management behaviors, beauty practices, and body self-representation and self-management can be achieved through photo beautification apps and digital beautification interventions.	Chow, 2022; Degen and Kleeberg-Niepage, 2023; Kuipers, 2022; Tawira and Ivanov, 2023; Zhao and Zappavigna, 2018
Stereotypical beliefs and patterns of behavior, traditional beauty norms and acceptable appearances, and digital culture-based perceptions and expectations are instrumental in cosmetic dermatology and plastic surgery intentions.	Bailey and Burkell, 2021; Hedman et al., 2022; Kunst et al., 2022; Luna Mora and Berry, 2021; Peng, 2021b; Pescott, 2020; Rodner et al., 2022; Yao et al., 2021
Augmented reality filters are pivotal in aesthetic self-objectification, negative evaluations and feelings, weight and eating concerns, and body image comparisons.	Glapka, 2022; Hedman et al., 2022; Luna Mora and Berry, 2021; Simay et al., 2022; Wang and Yu, 2023; Yao et al., 2021
Normative beauty ideals and standards, visual representations, and beautification practices integrate image modeling tools, photographic imaging technology, and digital beauty apps.	Findlay, 2019; Loke et al., 2020; Paxton et al., 2022; Rodgers et al., 2022; Taffel, 2021; Zhang, 2022

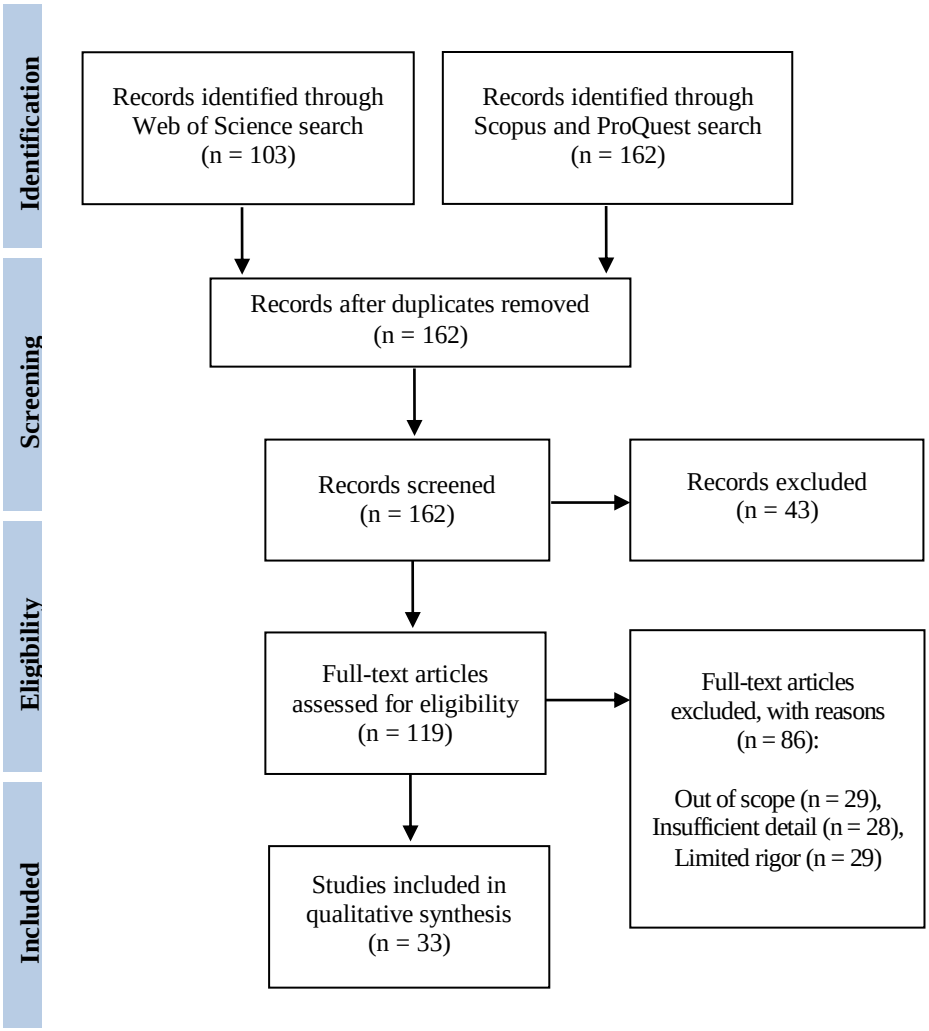


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

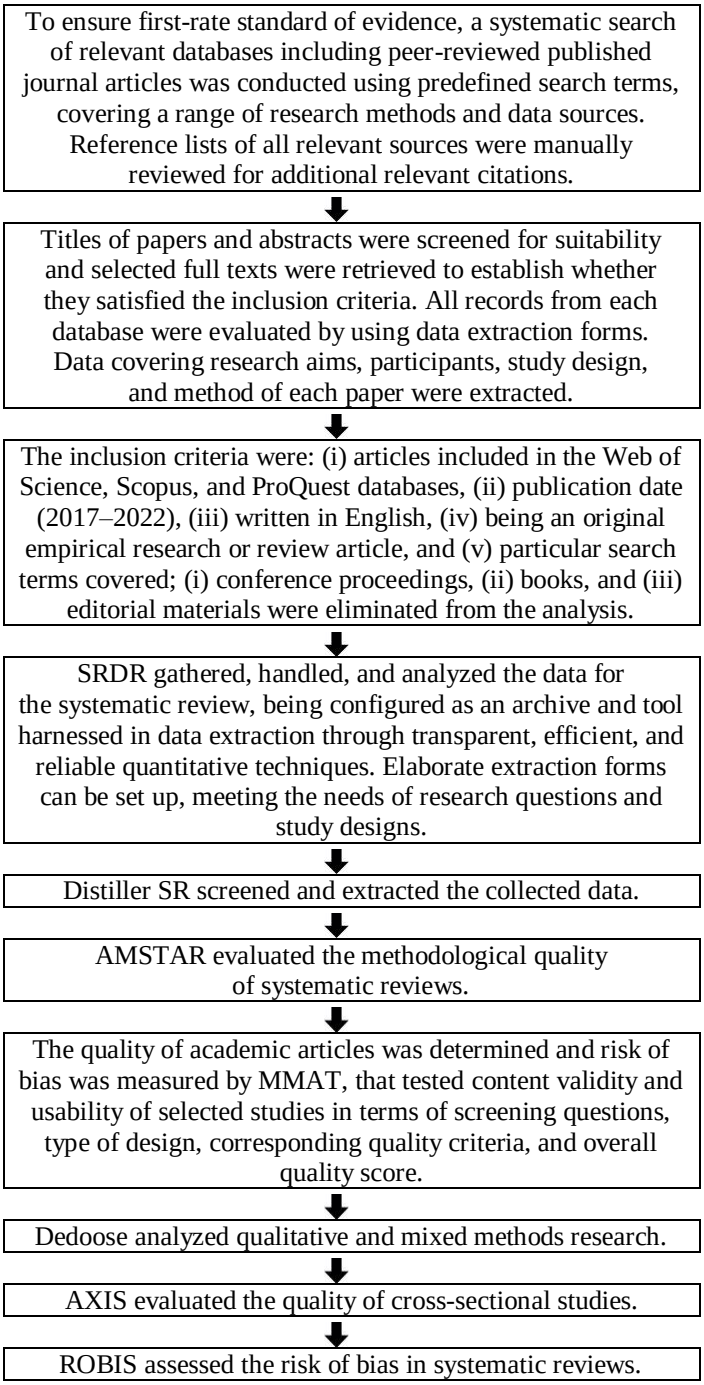


Figure 6 Screening and quality assessment tools

4. Idealized Appearance-focused Media and Edited and Retouched Images

Visual and discursive data assist augmented reality beauty apps (Elias and Gill, 2017; Findlay, 2019; Rodgers et al., 2022; Rodner et al., 2022; Wang, 2020; Yao et al., 2021; Zhang, 2022) with regard to body performance and presentation, social comparisons, unrealistic body images and self-esteem, digitally visible selves, and thin beauty ideals. Visually appealing self-presentations, attractive physical features, and low self-esteem are decisive in digitally-enhanced photos. Idealized appearance-focused media and edited and retouched images optimize emotional wellbeing, beauty ideal internalization, and social expectations and pressures.

Machine learning algorithms, in relation to unrealistic and negative body images and self-esteem (Barker, 2020; Felig and Goldenberg, 2023; Foster and Baker, 2022; Yao et al., 2021), articulate unrealistic beauty ideals, body dissatisfaction, mood and image manipulation, and social comparisons. Commonly shared appearance ideals and media representations of beauty optimize aesthetic visibility of social connections, negative self-esteem, and body dissatisfaction and shame in visual and virtual cultures.

Aesthetic self-objectification, body postures and gesticulation, social media-based identity formation, visual interpersonal communication, and negative emotions and body image (Evans, 2023; Glapka, 2022; Hedman et al., 2022; Paxton et al., 2022; Pescott, 2020; Rodgers et al., 2022; Rodríguez-Fuertes et al., 2022; Yao et al., 2021) can be achieved through facial recognition technologies. Digital self-representational media articulate unattainable sociocultural appearance ideals and unrealistically ideal body images. Social media image filters are instrumental in perceived popularity, thin beauty ideals, social media-based identity formation, and impression management. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Visual and discursive data assist augmented reality beauty apps with regard to body performance and presentation, social comparisons, unrealistic body images and self-esteem, digitally visible selves, and thin beauty ideals.	Elias and Gill, 2017; Findlay, 2019; Rodgers et al., 2022; Rodner et al., 2022; Wang, 2020; Yao et al., 2021; Zhang, 2022
Machine learning algorithms, in relation to unrealistic and negative body images and self-esteem, articulate unrealistic beauty ideals, and social comparisons.	Barker, 2020; Felig and Goldenberg, 2023; Foster and Baker, 2022; Yao et al., 2021
Aesthetic self-objectification, body postures and gesticulation, social media-based identity formation, visual interpersonal communication, and negative emotions and body image can be achieved through facial recognition technologies.	Evans, 2023; Glapka, 2022; Hedman et al., 2022; Paxton et al., 2022; Pescott, 2020; Rodgers et al., 2022; Rodríguez-Fuertes et al., 2022; Yao et al., 2021

5. Social Traits and Behaviors, Thin-Idealized Beauty, Body-Image Affective Judgments, and Unrealistic Physical Appearance

Normative beauty standards, idealized and unrealistic body imagery, media-induced body dissatisfaction, digital self-expression, and digital self-representation (Evans, 2023; McGill, 2022; Tiggemann, 2022; Zhang, 2022; Zhao and Zappavigna, 2018) require self-editing software. Semiotic technology articulate normative beauty ideals and social expectations and pressures in terms of strict body measurements.

Digital self-actualization in terms of commoditized beauty management (Eriksson and Kenalemang, 2023; Luna Mora and Berry, 2021; Peng, 2021; Simay et al., 2022; Wang et al., 2019) enables symbolic social boundaries, body aestheticization and self-expression, physical attributes and appearance, and photo-editing language and meanings. Beauty filters and virtual makeup require online self-presentation in relation to body aestheticization and self-expression, facial feature and aesthetic body enhancements, and low confidence levels. Selfie modification apps and virtual makeup tools are pivotal in idealized facial and bodily appearances, body appreciation and image concerns, socially constructed beliefs, and self-image alteration.

Visual knowledge sharing practices, appearance management behaviors, beauty practices, and body self-representation and self-management (Chow, 2022; Degen and Kleeberg-Niepage, 2023; Kuipers, 2022; Tawira and Ivanov, 2023; Zhao and Zappavigna, 2018) can be achieved through photo beautification apps and digital beautification interventions. Social traits and behaviors, thin-idealized beauty, body-image affective judgments, and unrealistic physical appearance develop on digitally networked images and biometric data. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Normative beauty standards, idealized and unrealistic body imagery, media-induced body dissatisfaction, digital self-expression, and digital self-representation require self-editing software.	Evans, 2023; McGill, 2022; Tiggemann, 2022; Zhang, 2022; Zhao and Zappavigna, 2018
Digital self-actualization in terms of commoditized beauty management enables symbolic social boundaries, body aestheticization and self-expression, physical attributes and appearance, and photo-editing language and meanings.	Eriksson and Kenalemang, 2023; Luna Mora and Berry, 2021; Peng, 2021; Simay et al., 2022; Wang et al., 2019
Visual knowledge sharing practices, appearance management behaviors, beauty practices, and body self-representation and self-management can be achieved through photo beautification apps and digital beautification interventions.	Chow, 2022; Degen and Kleeberg-Niepage, 2023; Kuipers, 2022; Tawira and Ivanov, 2023; Zhao and Zappavigna, 2018

6. Appearance-enhancement Apps, Augmented Reality Face Filters, and Virtual Try-Ons

Stereotypical beliefs and patterns of behavior, traditional beauty norms and acceptable appearances, and digital culture-based perceptions and expectations (Bailey and Burkell, 2021; Hedman et al., 2022; Kunst et al., 2022; Luna Mora and Berry, 2021; Peng, 2021b; Pescott, 2020; Rodner et al., 2022; Yao et al., 2021) are instrumental in cosmetic dermatology and plastic surgery intentions. Digital self-actualization of aesthetic body ideals and standards develop on symbolic social boundaries, body gestures and movements, physical attributes and appearance, and psychological worries and anxieties. Social media-based self-perception configures body image disturbance, objectified body consciousness, ideal body image standards, and social comparisons.

Augmented reality filters (Glapka, 2022; Hedman et al., 2022; Luna Mora and Berry, 2021; Simay et al., 2022; Wang and Yu, 2023; Yao et al., 2021) are pivotal in aesthetic self-objectification, negative evaluations and feelings, weight and eating concerns, and body image comparisons. Impression and appearance management can be achieved through augmented reality virtual try-on tools and makeup apps and filters. Appearance-enhancement apps, augmented reality face filters, and virtual try-ons are instrumental in idealized bodies and behavioral intentions.

Normative beauty ideals and standards, visual representations, and beautification practices (Findlay, 2019; Loke et al., 2020; Paxton et al., 2022; Rodgers et al., 2022; Taffel, 2021; Zhang, 2022) integrate image modeling tools, photographic imaging technology, and digital beauty apps and filters. Idealized appearance images and socially constructed beauty ideals can be attained through image retouching and remodeling. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Stereotypical beliefs and patterns of behavior, traditional beauty norms and acceptable appearances, and digital culture-based perceptions and expectations are instrumental in cosmetic dermatology and plastic surgery intentions.	Bailey and Burkell, 2021; Hedman et al., 2022; Kunst et al., 2022; Luna Mora and Berry, 2021; Peng, 2021b; Pescott, 2020; Rodner et al., 2022; Yao et al., 2021
Augmented reality filters are pivotal in aesthetic self-objectification, negative evaluations and feelings, weight and eating concerns, and body image comparisons.	Glapka, 2022; Hedman et al., 2022; Luna Mora and Berry, 2021; Simay et al., 2022; Wang and Yu, 2023; Yao et al., 2021
Normative beauty ideals and standards, visual representations, and beautification practices integrate image modeling tools, photographic imaging technology, and digital beauty apps and filters.	Findlay, 2019; Loke et al., 2020; Paxton et al., 2022; Rodgers et al., 2022; Taffel, 2021; Zhang, 2022

7. Discussion

I integrate my systematic review throughout research indicating how semiotic technology articulate normative beauty ideals and social expectations and pressures in terms of strict body measurements. My research complements recent analyses clarifying how beauty filters and virtual makeup require online self-presentation in relation to body aestheticization and self-expression, facial feature and aesthetic body enhancements, and low confidence levels. I elucidate, by cumulative evidence, previous research demonstrating how selfie modification apps and virtual makeup tools are pivotal in idealized facial and bodily appearances, body appreciation and image concerns, socially constructed beliefs, and self-image alteration.

8. Synopsis of the Main Research Outcomes

Idealized appearance images and socially constructed beauty ideals can be attained through image retouching and remodeling. Social traits and behaviors, thin-idealized beauty, body-image affective judgments, and unrealistic physical appearance develop on digitally networked images and biometric data. Social media image filters are instrumental in perceived popularity, thin beauty ideals, social media-based identity formation, and impression management. Impression and appearance management can be achieved through augmented reality virtual try-on tools and makeup apps and filters.

9. Conclusions

Relevant research has investigated whether social media-based self-perception configures body image disturbance, objectified body consciousness, ideal body image standards, and social comparisons. This systematic literature review presents the published peer-reviewed sources covering how visually appealing self-presentations, attractive physical features, and low self-esteem are decisive in digitally-enhanced photos. The research outcomes drawn from the above analyses indicate that commonly shared appearance ideals and media representations of beauty optimize aesthetic visibility of social connections, negative self-esteem, and body dissatisfaction and shame in visual and virtual cultures.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published in journals indexed in the Web of Science, Scopus, and ProQuest databases between 2017 and 2022, relevant sources on augmented reality face filters for unrealistic physical appearance and beauty images in terms of contextual visual meanings, negative thoughts

and behaviors, and social interactions and comparisons may have been excluded. The scope of my study also does not move forward the inspection of stereotypical beliefs and patterns of behavior, traditional beauty norms and acceptable appearances, and digital culture-based perceptions and expectations.

Subsequent analyses should develop on image modeling tools, photographic imaging technology, and digital beauty apps and filters. Future research should thus investigate photo beautification apps and digital beautification interventions. Attention should be directed to symbolic social boundaries, body aestheticization and self-expression, physical attributes and appearance, and photo-editing language and meanings.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the author. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

Data availability statement
All data generated or analyzed are included in the published article.

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Author contributions
The author confirms being the sole contributor of this work and approved it for publication. The author takes full responsibility for the accuracy and the integrity of the data analysis.

Conflict of interest statement
The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Disclosure by the editors of record
The editors declare no conflict of interest in the review and publication decision regarding this article.

Transparency statement
The author affirms that the manuscript represents an honest, accurate, and transparent account of the research being reported, that no relevant aspects of the study have been left out, and that any inconsistencies from the research as planned (and, if significant, registered) have been clarified.

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Photo Retouching Apps and Immersive and Interactive Technologies for Idealized Beauty Representations and Images: Digital Social Practices, Unfavorable Appearance Comparisons, and Self-Presentation Perceptions and Behaviors

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ABSTRACT. This paper provides a systematic literature review of studies investigating beauty filters and body filter use as socio-technological processes. Throughout June 2022, we performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "photo retouching apps and immersive and interactive technologies for idealized beauty representations and images" + "self-presentation perceptions and behaviors," "digital social practices," and "unfavorable appearance comparisons." As we inspected research published between 2017 and 2022, only 167 articles satisfied the eligibility criteria. By eliminating controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, we decided upon 36, generally empirical, sources. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Distiller SR, MMAT, and ROBIS.

Keywords: photo retouching app; immersive and interactive technologies; idealized beauty representation and image; self-presentation perception and behavior; digital social practice; unfavorable appearance comparison

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1. Introduction

Unrealistic physical appearance and thin-idealized female beauty can be achieved through aesthetic standards and evaluations, social beauty and attractiveness, and negative emotions. The purpose of our systematic review is to examine the recently published literature on self-presentation perceptions and behaviors, digital social practices, and unfavorable appearance comparisons and integrate the insights it configures on photo retouching apps and immersive and interactive technologies for idealized beauty representations and images. By analyzing the most recent (2017–2022) and significant (Web of Science, Scopus, and ProQuest) sources, our paper has attempted to prove that digital beauty technologies in terms of visual narratives further body dissatisfaction, weight and eating concerns, negative beliefs, thoughts, and feelings, ideal body image standards, and low self-esteem. The actuality and novelty of this study are articulated by addressing idealized beauty representations and images, specific personal traits and behaviors, social beauty and attractiveness, and aesthetic standards and evaluations, that is an emerging topic involving much interest. Our research problem is whether digital beauty filters assist visual social media cultures, semiotics, and networks (Andronie et al., 2021a, b) in terms of body transformation, visual sentiment prediction, and deep convolutional neural networks.

In this review, prior findings have been cumulated indicating that facial expression recognition techniques and machine learning tools (Andronie et al., 2023; Lăzăroiu et al., 2022a, b) shape perceived popularity, social comparisons, negative feelings and emotions, and visual discourses. The identified gaps advance digital alteration of facial images, social acceptance of cosmetic surgery, and appearance management behavior. Our main objective is to indicate that aesthetic body ideals and standardization integrate self-monitored body, body self-transformation, and idealized physical characteristics. This systematic review contributes to the literature on beauty filters and body filter use as socio-technological processes by clarifying that beauty apps and filters shape social pressures and acceptance, idealized facial expressions, and visual representations. This research endeavors to elucidate whether visual social media assist body image concerns with regard to idealized appearance and attractiveness. Our contribution is by integrating research findings indicating that beauty apps and image production systems further unattainable body ideal, self-image management, and appearance-oriented social media.

2. Theoretical Overview of the Main Concepts

Image augmentation algorithms, edited and retouched pictures, and beauty apps shape emotional well-being, social expectations and pressures, and visual aesthetic features. Social and symbolic significance of filtered self-

presentation, body image concerns, and negative self-perceptions develop on beautifying filters in reference to physical appearance ideals. The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), perceived popularity, social comparisons, negative feelings and emotions, and visual discourses (section 4), social pressures and acceptance, beauty norms and standards, and physical attractiveness (section 5), image augmentation algorithms, edited and retouched images, and beauty apps (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout June 2022, we performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "photo retouching apps and immersive and interactive technologies for idealized beauty representations and images" + "self-presentation perceptions and behaviors," "digital social practices," and "unfavorable appearance comparisons." As we inspected research published between 2017 and 2022, only 167 articles satisfied the eligibility criteria. By eliminating controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, we decided upon 36, generally empirical, sources (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Distiller SR, MMAT, and ROBIS (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
photo retouching apps and immersive and interactive technologies for idealized beauty representations and images + self-presentation perceptions and behaviors	58	13
photo retouching apps and immersive and interactive technologies for idealized beauty representations and images + digital social practices	55	12
photo retouching apps and immersive and interactive technologies for idealized beauty representations and images + unfavorable appearance comparisons	54	11
Type of paper		
Original research	145	35
Review	8	1
Conference proceedings	10	0
Book	2	0
Editorial	2	0

Source: Processed by the authors. Some topics overlap.

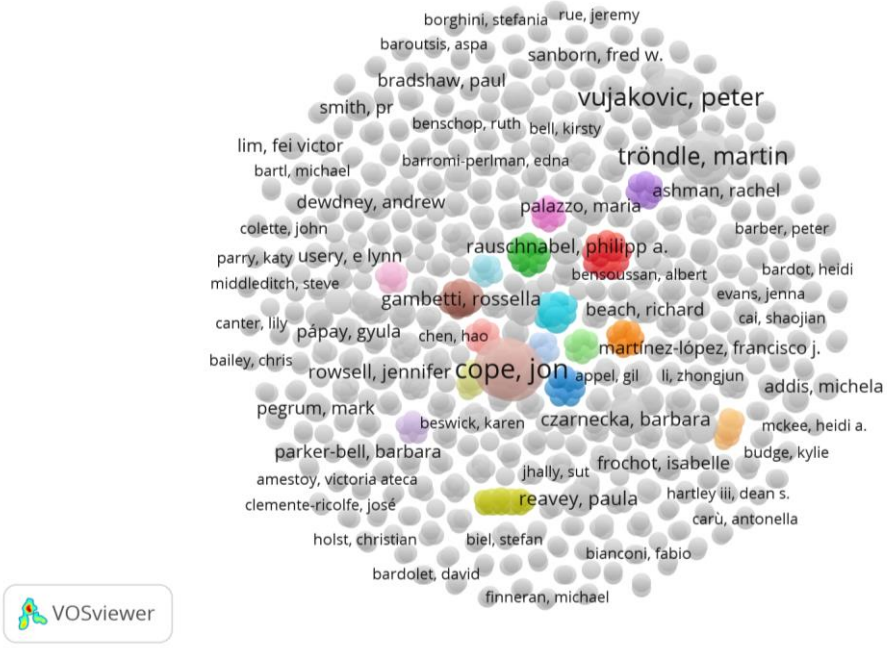


Figure 1 Co-authorship

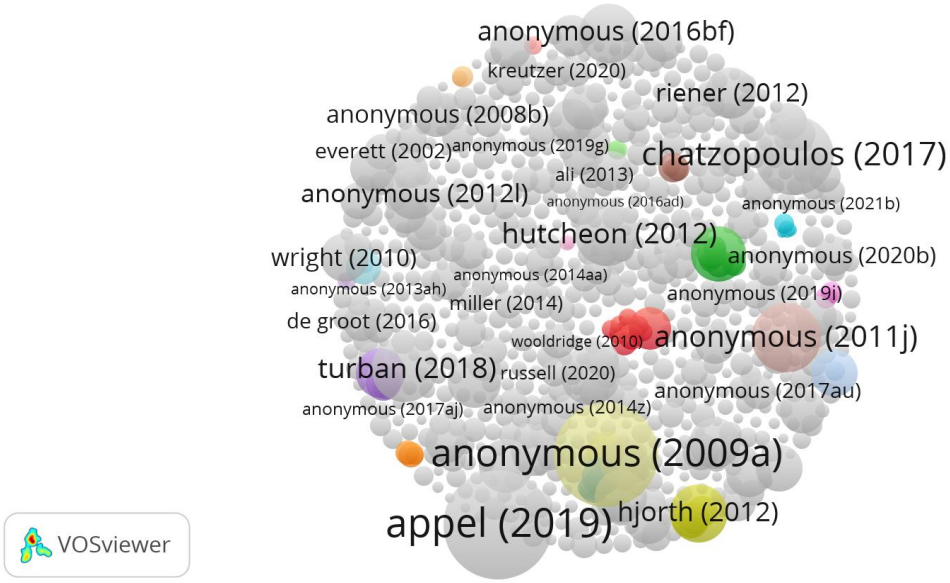


Figure 2 Citation

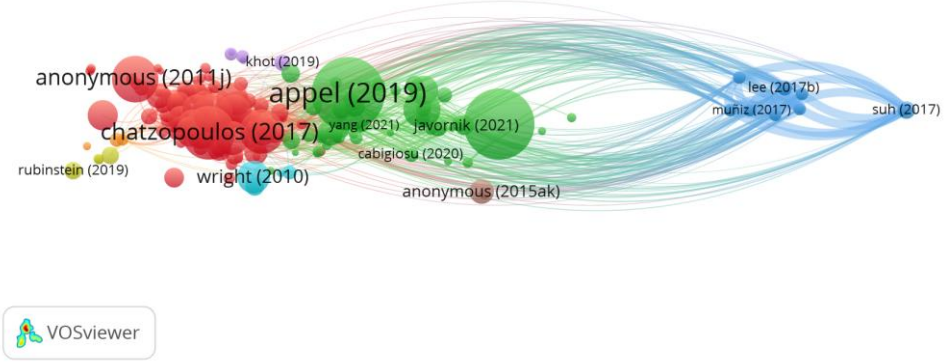


Figure 3 Bibliographic coupling

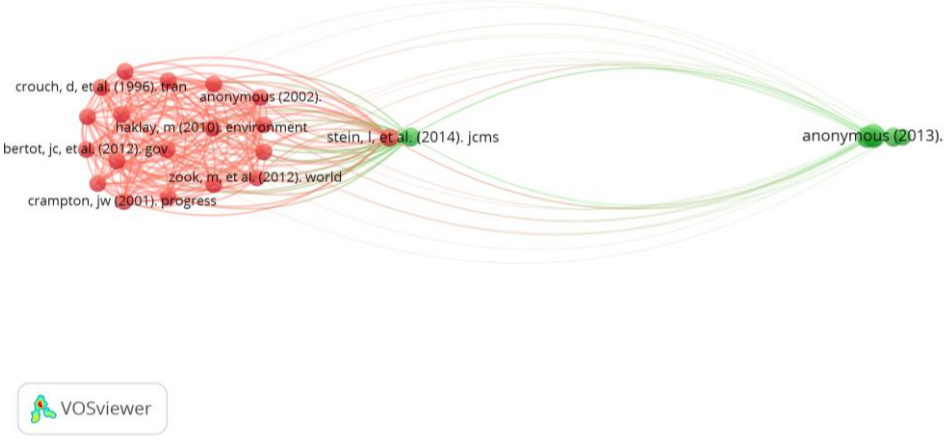


Figure 4 Co-citation

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings).

Beauty filters and body filter use as socio-technological processes are instrumental in digitally manipulated visual images and media, body image disturbance, and cosmetic surgery intention.	Eriksson and Kenalemang, 2023; Jarzyna, 2021; Maes and de Lenne, 2022; Peng, 2021; Qutub, 2021; Rodner et al., 2022; Yao et al., 2021
Make-up augmented reality and beauty apps shape cognitive and behavioral control, visual face and body perception, negative feelings and emotions, and low self-esteem.	Butt et al., 2022; Gill, 2017; Luna Mora and Berry, 2021; Whang et al., 2021
Facial enhancement technology and augmented reality beauty apps configure self-image and self-presentation idealization in terms of appearance self-esteem.	Findlay, 2019; Glapka, 2022; Luna Mora and Berry, 2021; Pescott, 2020; Rodgers et al., 2022; Rodríguez-Fuertes et al., 2022; Simay et al., 2022; Zhang, 2022
Visual representations and content, poor self-perception and self-esteem, social prestige and comparison processes, and emotional and aesthetic identities further digitally altered bodies with regard to ideal beauty standards and physical attractiveness.	Butkowski et al., 2022; McGill, 2022; Rodner et al., 2022; Sonmez and Esiyok, 2022; Staniewski and Awruk, 2022; Yang, 2022
Augmented reality face filters are pivotal in digital alteration of facial images, social acceptance of cosmetic surgery, and appearance management behavior across online social contexts.	Evans, 2023; Kuipers, 2022; Maes and de Lenne, 2022; Paxton et al., 2022; Peng, 2021; Qutub, 2021; Rodgers et al., 2022
Facial augmentation filters, automated computational processing techniques, beauty apps, and image automation tools optimize social pressures and acceptance, beauty norms and standards, and physical attractiveness.	Barker, 2020: Felig and Goldenberg, 2023; Foster and Baker, 2022; Loke et al., 2020; Taffel, 2021; Zhang, 2022
Digital commodification of self-identity, of self-tracking data, of self-actualization, of self-presentation, and of self-care can be achieved through aesthetic and bodily appearance and behavior codes, unpleasant and conflicting feelings, expressive behavior of body language, and social beliefs and values.	Eriksson and Kenalemang, 2023; Luna Mora and Berry, 2021; Mihăilă and Braniște, 2021; Peng, 2021; Pescott, 2020; Rodríguez-Fuertes et al., 2022; Simay et al., 2022; Wang et al., 2019
Photorealistic virtual try-on apps integrate idealized beauty representations and images, specific personal traits and behaviors, social beauty and attractiveness, and aesthetic standards and evaluations.	Degen and Kleeberg-Niepage, 2023; Kuipers, 2022; Loke et al., 2020; Taffel, 2021; Tawira and Ivanov, 2023; Zhang, 2022
Visual data mining tools and digitally altered body images are pivotal in sociocultural terms and contexts, edited physical appearance, and idealized body representations across visual social media cultures and semiotics.	Findlay, 2019; McGill, 2022; Paxton et al., 2022; Rodgers et al., 2022; Tiggemann, 2022

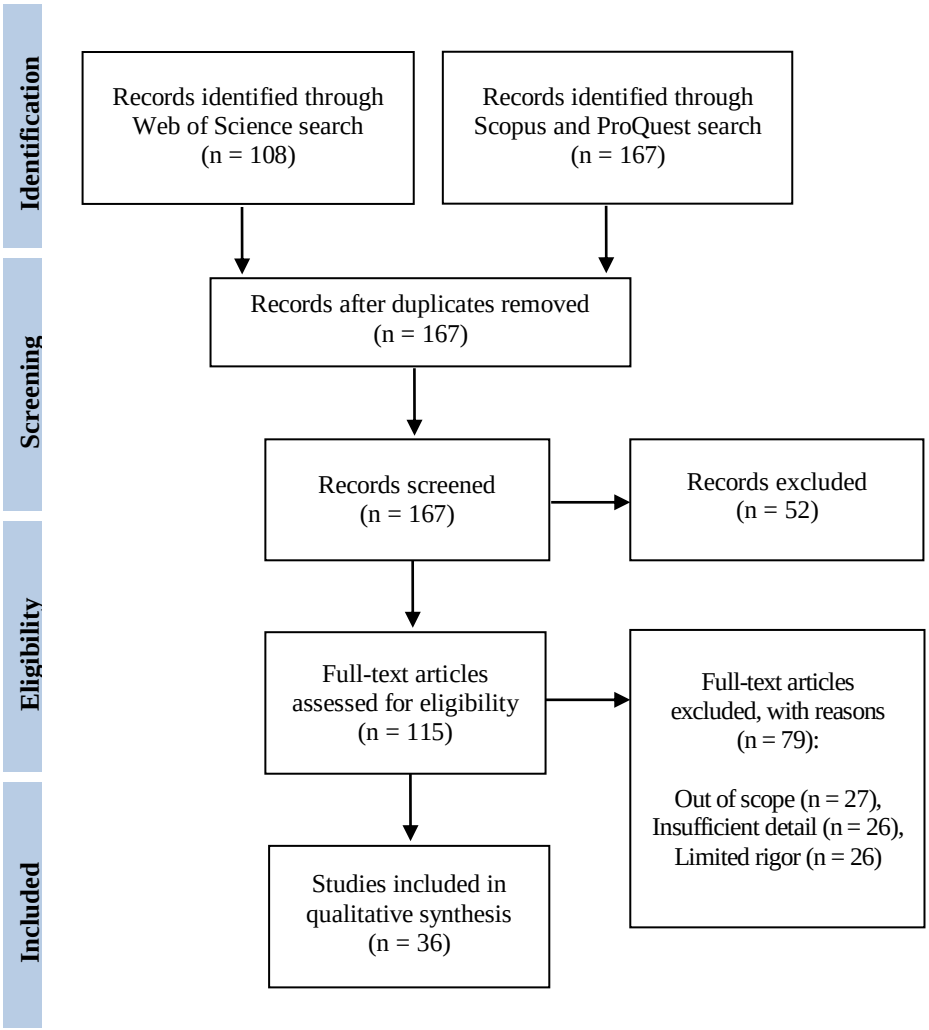


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

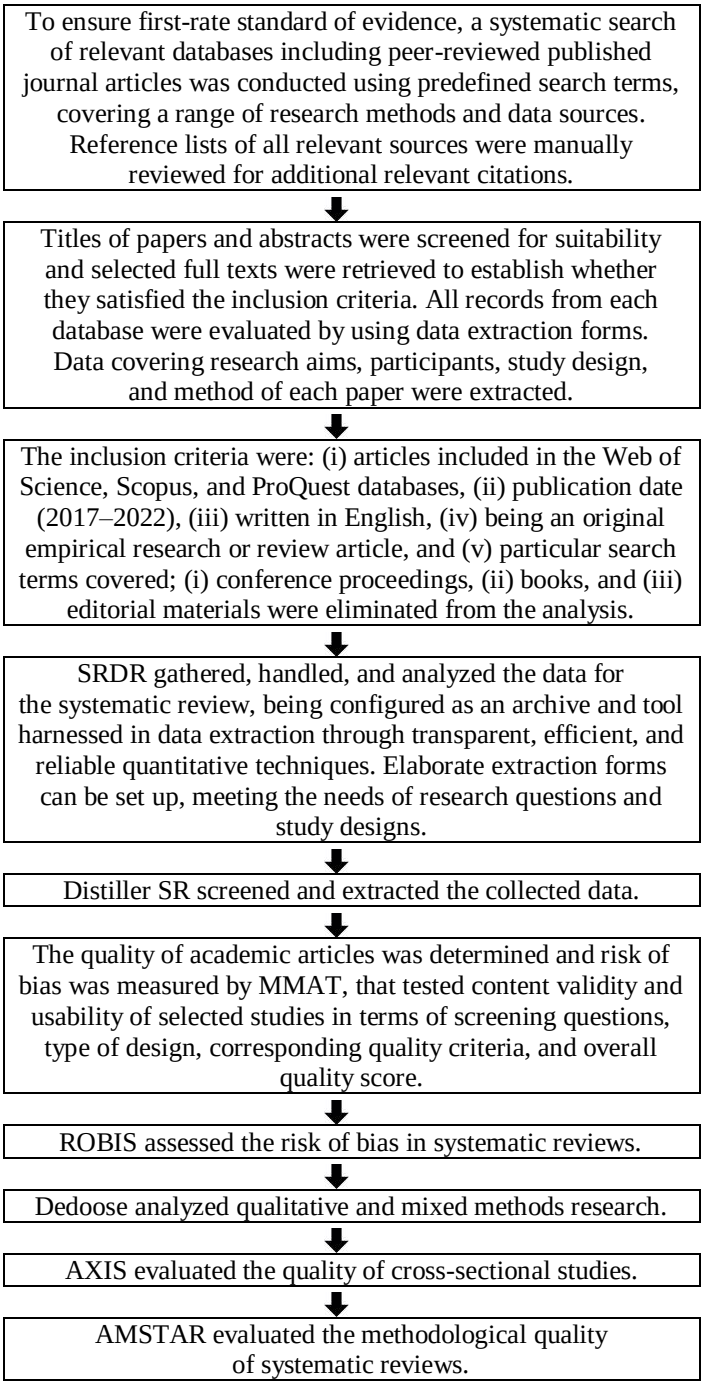


Figure 6 Screening and quality assessment tools

4. Perceived Popularity, Social Comparisons, Negative Feelings and Emotions, and Visual Discourses

Beauty filters and body filter use as socio-technological processes (Eriksson and Kenalemang, 2023; Jarzyna, 2021; Maes and de Lenne, 2022; Peng, 2021; Qutub, 2021; Rodner et al., 2022; Yao et al., 2021) are instrumental in digitally manipulated visual images and media, body image disturbance, and cosmetic surgery intention. Negative psychological states and behaviors, facial attractiveness, and social and emotional needs are pivotal in selfie modification apps. Digital beauty technologies in terms of visual narratives further body dissatisfaction, weight and eating concerns, negative beliefs, thoughts, and feelings, ideal body image standards, and low self-esteem.

Make-up augmented reality and beauty apps (Butt et al., 2022; Gill, 2017; Luna Mora and Berry, 2021; Whang et al., 2021) shape cognitive and behavioral control, visual face and body perception, negative feelings and emotions, and low self-esteem. Aesthetic body ideals and standardization integrate self-monitored body, body self-transformation, and idealized physical characteristics.

Facial enhancement technology and augmented reality beauty apps (Findlay, 2019; Glapka, 2022; Luna Mora and Berry, 2021; Pescott, 2020; Rodgers et al., 2022; Rodríguez-Fuertes et al., 2022; Simay et al., 2022; Zhang, 2022) configure self-image and self-presentation idealization in terms of appearance self-esteem. Facial expression recognition techniques and machine learning tools shape perceived popularity, social comparisons, negative feelings and emotions, and visual discourses. Beauty apps and filters shape social pressures and acceptance, idealized facial expressions, and visual representations. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Beauty filters and body filter use as socio-technological processes are instrumental in digitally manipulated visual images and media, body image disturbance, and cosmetic surgery intention.	Eriksson and Kenalemang, 2023; Jarzyna, 2021; Maes and de Lenne, 2022; Peng, 2021; Qutub, 2021; Rodner et al., 2022; Yao et al., 2021
Make-up augmented reality and beauty apps shape cognitive and behavioral control, visual face and body perception, negative feelings and emotions, and low self-esteem.	Butt et al., 2022; Gill, 2017; Luna Mora and Berry, 2021; Whang et al., 2021
Facial enhancement technology and augmented reality beauty apps configure self-image and self-presentation idealization in terms of appearance self-esteem.	Findlay, 2019; Glapka, 2022; Luna Mora and Berry, 2021; Pescott, 2020; Rodgers et al., 2022; Rodríguez-Fuertes et al., 2022; Simay et al., 2022; Zhang, 2022

5. Social Pressures and Acceptance, Beauty Norms and Standards, and Physical Attractiveness

Visual representations and content, poor self-perception and self-esteem, social prestige and comparison processes, and emotional and aesthetic identities further digitally altered bodies (Butkowski et al., 2022; McGill, 2022; Rodner et al., 2022; Sonmez and Esiyok, 2022; Staniewski and Awruk, 2022; Yang, 2022) with regard to ideal beauty standards and physical attractiveness. Digital beauty filters assist visual social media cultures, semiotics, and networks in terms of body transformation, visual sentiment prediction, and deep convolutional neural networks.

Augmented reality face filters are pivotal in digital alteration of facial images, social acceptance of cosmetic surgery, and appearance management behavior (Evans, 2023; Kuipers, 2022; Maes and de Lenne, 2022; Paxton et al., 2022; Peng, 2021; Qutub, 2021; Rodgers et al., 2022) across online social contexts. Unrealistic physical appearance and thin-idealized female beauty can be achieved through aesthetic standards and evaluations, social beauty and attractiveness, and negative emotions. Visual social media assist body image concerns with regard to idealized appearance and attractiveness.

Facial augmentation filters, automated computational processing techniques, beauty apps, and image automation tools (Barker, 2020: Felig and Goldenberg, 2023; Foster and Baker, 2022; Loke et al., 2020; Taffel, 2021; Zhang, 2022) optimize social pressures and acceptance, beauty norms and standards, and physical attractiveness. Social and symbolic significance of filtered self-presentation, body image concerns, and negative self-perceptions develop on beautifying filters in reference to physical appearance ideals. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Visual representations and content, poor self-perception and self-esteem, social prestige and comparison processes, and emotional and aesthetic identities further digitally altered bodies with regard to ideal beauty standards and physical attractiveness.	Butkowski et al., 2022; McGill, 2022; Rodner et al., 2022; Sonmez and Esiyok, 2022; Staniewski and Awruk, 2022; Yang, 2022
Augmented reality face filters are pivotal in digital alteration of facial images, social acceptance of cosmetic surgery, and appearance management behavior across online social contexts.	Evans, 2023; Kuipers, 2022; Maes and de Lenne, 2022; Paxton et al., 2022; Peng, 2021; Qutub, 2021; Rodgers et al., 2022
Facial augmentation filters, automated computational processing techniques, beauty apps, and image automation tools optimize social pressures and acceptance, beauty norms and standards, and physical attractiveness.	Barker, 2020: Felig and Goldenberg, 2023; Foster and Baker, 2022; Loke et al., 2020; Taffel, 2021; Zhang, 2022

6. Image Augmentation Algorithms, Edited and Retouched Pictures, and Beauty Apps

Digital commodification of self-identity, of self-tracking data, of self-actualization, of self-presentation, and of self-care (Eriksson and Kenalemang, 2023; Luna Mora and Berry, 2021; Mihăilă and Branişte, 2021; Peng, 2021; Pescott, 2020; Rodríguez-Fuertes et al., 2022; Simay et al., 2022; Wang et al., 2019) can be achieved through aesthetic and bodily appearance and behavior codes, unpleasant and conflicting feelings, expressive behavior of body language, and social beliefs and values. Virtual makeover apps assist bodily behaviors and experiences in terms of media-promoted appearance ideals, social norms, and facial attractiveness.

Photorealistic virtual try-on apps (Degen and Kleeberg-Niepage, 2023; Kuipers, 2022; Loke et al., 2020; Taffel, 2021; Tawira and Ivanov, 2023; Zhang, 2022) integrate idealized beauty representations and images, specific personal traits and behaviors, social beauty and attractiveness, and aesthetic standards and evaluations. Image augmentation algorithms, edited and retouched pictures, and beauty apps shape emotional well-being, social expectations and pressures, and visual aesthetic features.

Visual data mining tools and digitally altered body images are pivotal in sociocultural terms and contexts, edited physical appearance, and idealized body representations (Findlay, 2019; McGill, 2022; Paxton et al., 2022; Rodgers et al., 2022; Tiggemann, 2022) across visual social media cultures and semiotics. Beauty apps and image production systems further unattainable body ideal, self-image management, and appearance-oriented social media. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Digital commodification of self-identity, of self-tracking data, of self-actualization, of self-presentation, and of self-care can be achieved through aesthetic and bodily appearance and behavior codes, unpleasant and conflicting feelings, expressive behavior of body language, and social beliefs and values.	Eriksson and Kenalemang, 2023; Luna Mora and Berry, 2021; Mihăilă and Branişte, 2021; Peng, 2021; Pescott, 2020; Rodríguez-Fuertes et al., 2022; Simay et al., 2022; Wang et al., 2019
Photorealistic virtual try-on apps integrate idealized beauty representations and images, specific personal traits and behaviors, social beauty and attractiveness, and aesthetic standards and evaluations.	Degen and Kleeberg-Niepage, 2023; Kuipers, 2022; Loke et al., 2020; Taffel, 2021; Tawira and Ivanov, 2023; Zhang, 2022
Visual data mining tools and digitally altered body images are pivotal in sociocultural terms and contexts, edited physical appearance, and idealized body representations across visual social media cultures and semiotics.	Findlay, 2019; McGill, 2022; Paxton et al., 2022; Rodgers et al., 2022; Tiggemann, 2022

7. Discussion

We integrate our systematic review throughout research indicating how negative psychological states and behaviors, facial attractiveness, and social and emotional needs are pivotal in selfie modification apps. Our research complements recent analyses clarifying how unrealistic physical appearance and thin-idealized female beauty can be achieved through aesthetic standards and evaluations, social beauty and attractiveness, and negative emotions. We elucidate, by cumulative evidence, previous research demonstrating how aesthetic body ideals and standardization integrate self-monitored body, body self-transformation, and idealized physical characteristics.

8. Synopsis of the Main Research Outcomes

Beauty apps and image production systems further unattainable body ideal, self-image management, and appearance-oriented social media. Facial expression recognition techniques and machine learning tools shape perceived popularity, social comparisons, negative feelings and emotions, and visual discourses. Beauty apps and filters shape social pressures and acceptance, idealized facial expressions, and visual representations. Social and symbolic significance of filtered self-presentation, body image concerns, and negative self-perceptions develop on beautifying filters in reference to physical appearance ideals.

9. Conclusions

Relevant research has investigated whether image augmentation algorithms, edited and retouched pictures, and beauty apps shape emotional well-being, social expectations and pressures, and visual aesthetic features. This systematic literature review presents the published peer-reviewed sources covering how digital beauty technologies in terms of visual narratives further body dissatisfaction, weight and eating concerns, negative beliefs, thoughts, and feelings, ideal body image standards, and low self-esteem. The research outcomes drawn from the above analyses indicate that virtual makeover apps assist bodily behaviors and experiences in terms of media-promoted appearance ideals, social norms, and facial attractiveness.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published in journals indexed in the Web of Science, Scopus, and ProQuest databases between 2017 and 2022, relevant sources on photo retouching apps and immersive and interactive technologies for idealized beauty representations and images in terms of self-presentation

perceptions and behaviors, digital social practices, and unfavorable appearance comparisons may have been excluded. The scope of our study also does not move forward the inspection of visual data mining tools and digitally altered body images.

Subsequent analyses should develop on digitally manipulated visual images and media, body image disturbance, and cosmetic surgery intention. Future research should thus investigate facial augmentation filters, automated computational processing techniques, beauty apps, and image automation tools. Attention should be directed to digital commodification of self-identity, of self-tracking data, of self-actualization, of self-presentation, and of self-care.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the authors. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

Data availability statement
All data generated or analyzed are included in the published article.

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Author contributions
All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication. The authors take full responsibility for the accuracy and the integrity of the data analysis.

Conflict of interest statement
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Disclosure by the editors of record
The editors declare no conflict of interest in the review and publication decision regarding this article.

Transparency statement
The authors affirm that the manuscript represents an honest, accurate, and transparent account of the research being reported, that no relevant aspects of the study have been left out, and that any inconsistencies from the research as planned (and, if significant, registered) have been clarified.

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Beauty Apps and Filters in Visual Digital Cultures: Perceived Sociocultural Pressures, Self-Rated Emotional Expressiveness, and Image Processing Algorithms

Mark Newell*

ABSTRACT. The objective of this paper is to systematically review unattainable fashionable beauty ideals integrating virtual accessories of face-perfecting filters. The findings and analyses highlight that digital self-tracking devices and beauty apps articulate idealized facial images, body ideal internalization, and sociocultural pressures. Throughout May 2022, I performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "beauty apps and filters in visual digital cultures" + "perceived sociocultural pressures," "self-rated emotional expressiveness," and "image processing algorithms." As I inspected research published between 2017 and 2022, only 166 articles satisfied the eligibility criteria. By removing controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, I decided upon 32, generally empirical, sources. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, MMAT, and SRDR.

Keywords: beauty app and filter; visual digital culture; perceived sociocultural pressure; self-rated emotional expressiveness; image processing algorithm

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1. Introduction

Idealized corporeal beautification, individual and collective values, appearance and behavior codes, and socially controlled bodies can be achieved through synthetic geospatial data (Andronie et al., 2023; Lăzăroiu et al., 2022) and beauty apps. The purpose of my systematic review is to examine the recently published literature on perceived sociocultural pressures, self-rated emotional expressiveness, and image processing algorithms and integrate the insights it configures on beauty apps and filters in visual digital cultures. By analyzing the most recent (2017–2022) and significant (Web of Science, Scopus, and ProQuest) sources, my paper has attempted to prove that filtered self-portrait photos configure socio-cultural norms of idealized facial beauty, favorable appearance evaluation, and low body appreciation. The actuality and novelty of this study are articulated by addressing unattainable fashionable beauty ideals integrating virtual accessories of face-perfecting filters, that is an emerging topic involving much interest. My research problem is whether visual social networking sites and digital beauty apps integrate idealized facial and body representations.

In this review, prior findings have been cumulated indicating that digital self-tracking devices and beauty apps articulate idealized facial images, body ideal internalization, and sociocultural pressures. The identified gaps advance socially constructed attractiveness and appealing self-presentation attained through beauty filters. My main objective is to indicate that facial emotion recognition systems and enhanced self-portrait photos further facial appearance and societal beauty ideals and standards, body image and facial appearance dissatisfaction, and thin-ideal internalization. This systematic review contributes to the literature on social norms and expectations, negative self-presentations and self-evaluations, and body image and self-esteem concerns by clarifying that experiential augmented reality apps enable societal beauty ideals, negative body image, and favorable appearance evaluation. This research endeavors to elucidate whether photo-editing beauty apps, semiotic technology (Andronie et al., 2021a, b; Nagy et al., 2023) and biometric data further social and cultural dynamics, negative personality traits, and narcissistic self-representation. My contribution is by integrating research findings indicating that self-portrait photo-taking and beauty apps enable ideal appearance management, body dissatisfaction, and facial attractiveness.

2. Theoretical Overview of the Main Concepts

Deep artificial neural and generative adversarial networks, together with synthetic visual media, articulate low self-esteem. Unachievable appearance and normative beauty ideals, physical attractiveness, and negative emotional well-being can be achieved through aesthetic and affective technologies.

Affectively mediated social networks integrate beauty norms, perceived facial attractiveness, and selfie-taking practices in visual digital cultures. Self-presentation perceptions and behaviors, together with digital social practices and interactive behaviors, require machine learning-based, image processing, and semantic filtering techniques. The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), social norms and expectations, negative self-presentations and self-evaluations, and body image and self-esteem concerns (section 4), societal beauty ideals, negative body image, and favorable appearance evaluation (section 5), socio-cultural norms of idealized facial beauty, favorable appearance evaluation, and low body appreciation (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout May 2022, I performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "beauty apps and filters in visual digital cultures" + "perceived sociocultural pressures," "self-rated emotional expressiveness," and "image processing algorithms." As I inspected research published between 2017 and 2022, only 166 articles satisfied the eligibility criteria. By removing controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, I decided upon 32, generally empirical, sources (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, MMAT, and SRDR (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
beauty apps and filters in visual digital cultures + perceived sociocultural pressures	58	12
beauty apps and filters in visual digital cultures + self-rated emotional expressiveness	55	10
beauty apps and filters in visual digital cultures + image processing algorithms	53	10
Type of paper		
Original research	142	30
Review	9	2
Conference proceedings	11	0
Book	2	0
Editorial	2	0

Source: Processed by the author. Some topics overlap.

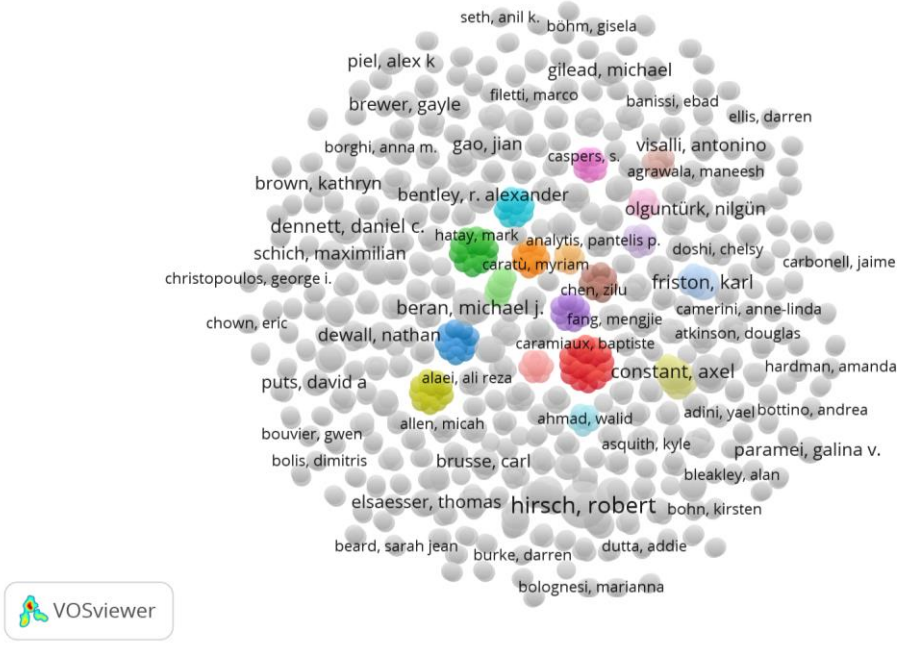


Figure 1 Co-authorship

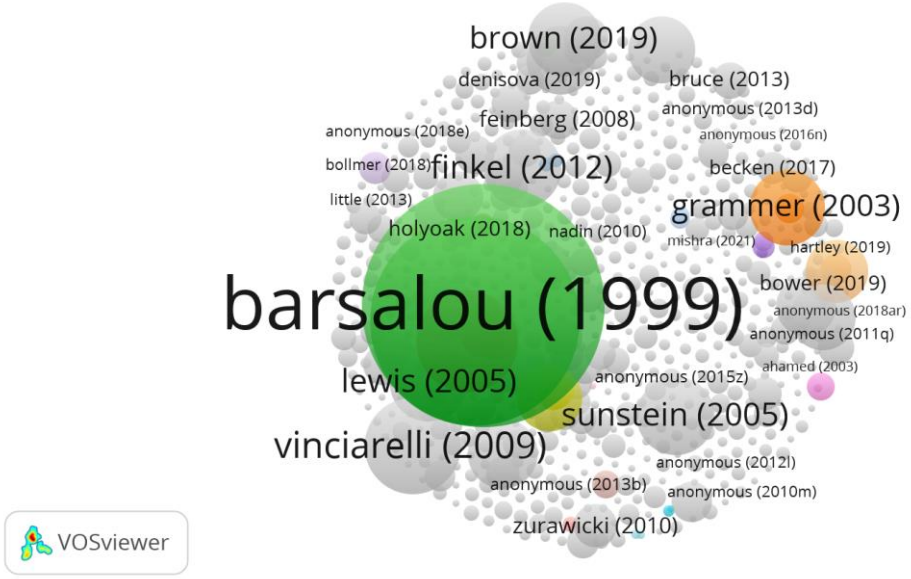


Figure 2 Citation

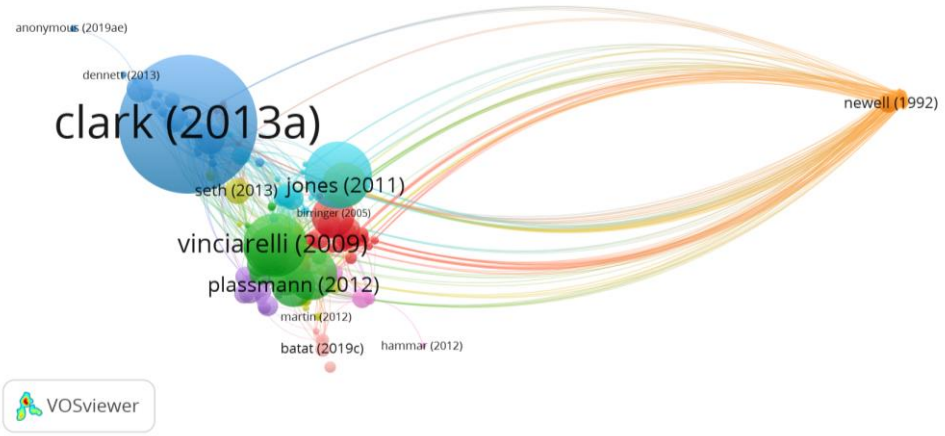


Figure 3 Bibliographic coupling

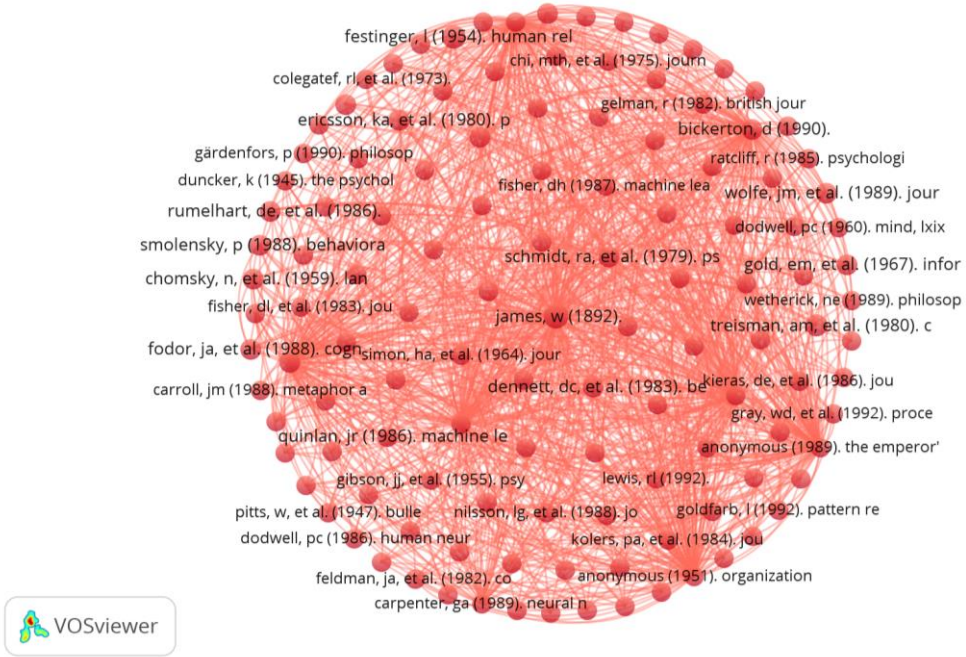


Figure 4 Co-citation

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings).

Bodily and facial appearances, self-modifying practices, and visual representations necessitate aesthetic self-tracking and self-monitoring devices in the context of standardized beauty aesthetics and appearance ideals.	Degen and Kleeberg-Niepage, 2023; Eriksson and Kenalemang, 2023; Findlay, 2019; Morikawa et al., 2021; Peng, 2021; Rome and Lambert, 2020; Wang et al., 2019; Zhang, 2022
Idealized self-actualization social practices, body language, gestures, and movements, and individual and collective values articulate synthetic geospatial data in relation to self-monitored body.	Findlay, 2019; Luna Mora and Berry, 2021; Rodgers et al., 2022; Zhang, 2022
Unattainable fashionable beauty ideals integrate virtual accessories of face-perfecting filters as regards social norms and expectations, negative self-presentations and self-evaluations, and body image and self-esteem concerns.	Barker, 2020; Eriksson and Kenalemang, 2023; Felig and Goldenberg, 2023; Foster and Baker, 2022; Peng, 2021; Wang et al., 2019
Augmented reality-based alternatively extended selves integrate standardized beauty ideals in terms of body weight and size, spatial distribution of socially controlled, multifaceted, and mediated corporeality, and non-verbal inconsistencies displaying pleasant emotions and hostile reactions.	El-Shamandi Ahmed et al., 2023; Eriksson and Kenalemang, 2023; Luna Mora and Berry, 2021; Peng, 2021; Rodríguez-Fuertes et al., 2022; Wang et al., 2019
Idealized facial images, unattainable physical beauty, and beautification practices necessitate digital self-presentation and sociality.	Findlay, 2019; Hsu et al., 2021; Lavrence and Cambre, 2020; Millière, 2022; Ponseti et al., 2022; Wang et al., 2019; Zhang, 2022
Negative emotional states and mental attitudes can be achieved through self-monitoring and self-tracking technologies and augmented reality beauty apps.	Butt et al., 2022; Eriksson and Kenalemang, 2023; Gill, 2017; Peng, 2021; Wang et al., 2019; Whang et al., 2021
Socially constructed attractiveness and appealing self-presentation can be attained through beauty filters in relation to facial and bodily expressions, intersecting social identities, and poor body image and self-esteem.	Butkowski et al., 2022; Luna Mora and Berry, 2021; Rodner et al., 2022; Staniewski and Awruk, 2022; Yang, 2022
Low body self-esteem, visual perceptions, and physical attractiveness necessitate artificial intelligence color cosmetics apps and augmented reality-enhanced virtual try-ons in terms of beauty ideals and standards.	Hawker and Carah, 2020; Luna Mora and Berry, 2021; Ota and Nakano, 2021; Simay et al., 2022
Visual aesthetic features, normative beauty standards, and unrealistic physical appearance develop on beauty apps as regards strict body measurements.	Eriksson and Kenalemang, 2023; Findlay, 2019; Peng, 2021; Peng and Gu, 2021; Rome and Lambert, 2020; Sun, 2021; Wang et al., 2019; Zhang, 2022; Zhao and Zappavigna, 2018

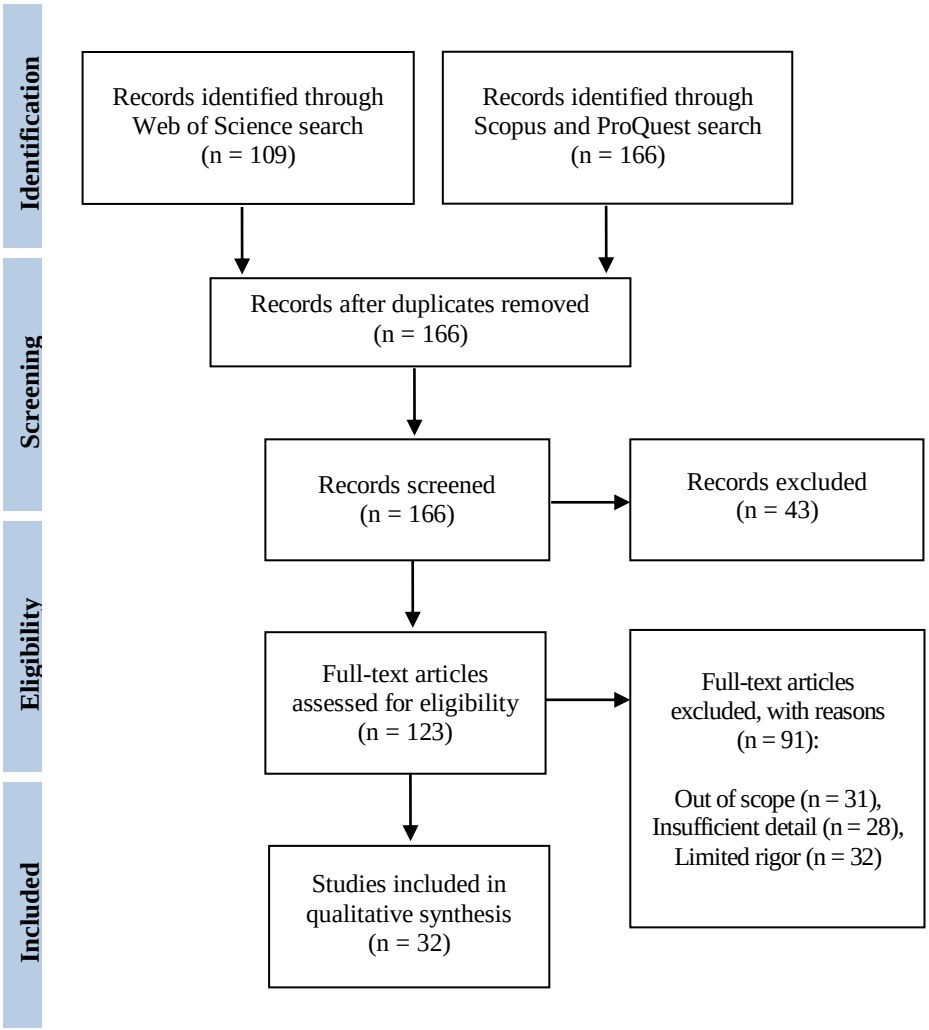


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

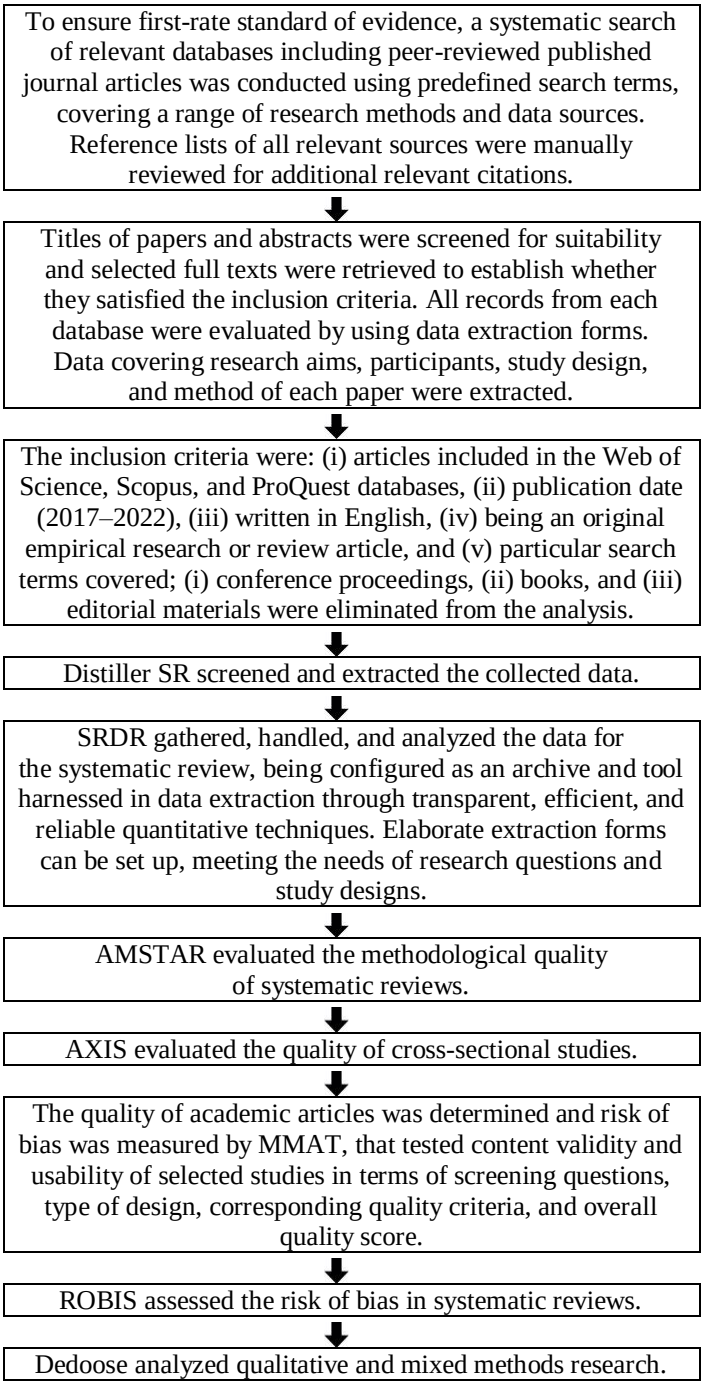


Figure 6 Screening and quality assessment tools

4. Social Norms and Expectations, Negative Self-Presentations and Self-Evaluations, and Body Image and Self-Esteem Concerns

Bodily and facial appearances, self-modifying practices, and visual representations (Degen and Kleeberg-Niepage, 2023; Eriksson and Kenalemang, 2023; Findlay, 2019; Morikawa et al., 2021; Peng, 2021; Rome and Lambert, 2020; Wang et al., 2019; Zhang, 2022) necessitate aesthetic self-tracking and self-monitoring devices in the context of standardized beauty aesthetics and appearance ideals. Self-presentation perceptions and behaviors, together with digital social practices and interactive behaviors, require machine learning-based, image processing, and semantic filtering techniques. Visual social networking sites and digital beauty apps integrate idealized facial and body representations.

Idealized self-actualization social practices, body language, gestures, and movements, and individual and collective values (Findlay, 2019; Luna Mora and Berry, 2021; Rodgers et al., 2022; Zhang, 2022) articulate synthetic geospatial data in relation to self-monitored body. Unachievable appearance and normative beauty ideals, physical attractiveness, and negative emotional well-being can be achieved through aesthetic and affective technologies.

Unattainable fashionable beauty ideals integrate virtual accessories of face-perfecting filters (Barker, 2020; Eriksson and Kenalemang, 2023; Felig and Goldenberg, 2023; Foster and Baker, 2022; Peng, 2021; Wang et al., 2019) as regards social norms and expectations, negative self-presentations and self-evaluations, and body image and self-esteem concerns. Facial emotion recognition systems and enhanced self-portrait photos further facial appearance and societal beauty ideals and standards, body image and facial appearance dissatisfaction, and thin-ideal internalization. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Bodily and facial appearances, self-modifying practices, and visual representations necessitate aesthetic self-tracking and self-monitoring devices in the context of standardized beauty aesthetics and appearance ideals.	Degen and Kleeberg-Niepage, 2023; Eriksson and Kenalemang, 2023; Findlay, 2019; Morikawa et al., 2021; Peng, 2021; Rome and Lambert, 2020; Wang et al., 2019; Zhang, 2022
Idealized self-actualization social practices, body language, gestures, and movements, and individual and collective values articulate synthetic geospatial data in relation to self-monitored body.	Findlay, 2019; Luna Mora and Berry, 2021; Rodgers et al., 2022; Zhang, 2022
Unattainable fashionable beauty ideals integrate virtual accessories of face-perfecting filters as regards social norms and expectations, negative self-presentations and self-evaluations, and body image and self-esteem concerns.	Barker, 2020; Eriksson and Kenalemang, 2023; Felig and Goldenberg, 2023; Foster and Baker, 2022; Peng, 2021; Wang et al., 2019

5. Societal Beauty Ideals, Negative Body Image, and Favorable Appearance Evaluation

Augmented reality-based alternatively extended selves (El-Shamandi Ahmed et al., 2023; Eriksson and Kenalemang, 2023; Luna Mora and Berry, 2021, Peng, 2021; Rodríguez-Fuertes et al., 2022; Wang et al., 2019) integrate standardized beauty ideals in terms of body weight and size, spatial distribution of socially controlled, multifaceted, and mediated corporeality, and non-verbal inconsistencies displaying pleasant emotions and hostile reactions, e.g., joy, happiness, enthusiasm, anger, pain, fear, surprise, irritation, disgust, melancholy, sadness, disappointment, and contempt. Digital self-tracking devices and beauty apps articulate idealized facial images, body ideal internalization, and sociocultural pressures.

Idealized facial images, unattainable physical beauty, and beautification practices (Findlay, 2019; Hsu et al., 2021; Lavrence and Cambre, 2020; Millière, 2022; Ponseti et al., 2022; Wang et al., 2019; Zhang, 2022) necessitate digital self-presentation and sociality. Deep artificial neural and generative adversarial networks, together with synthetic visual media, articulate low self-esteem. Experiential augmented reality apps enable societal beauty ideals, negative body image, and favorable appearance evaluation.

Negative emotional states and mental attitudes (Butt et al., 2022; Eriksson and Kenalemang, 2023; Gill, 2017; Peng, 2021; Wang et al., 2019; Whang et al., 2021) can be achieved through self-monitoring and self-tracking technologies and augmented reality beauty apps. Self-portrait photo-taking and beauty apps enable ideal appearance management, body dissatisfaction, and facial attractiveness. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Augmented reality-based alternatively extended selves integrate standardized beauty ideals in terms of body weight and size, spatial distribution of socially controlled, multifaceted, and mediated corporeality, and non-verbal inconsistencies displaying pleasant emotions and hostile reactions.	El-Shamandi Ahmed et al., 2023; Eriksson and Kenalemang, 2023; Luna Mora and Berry, 2021; Peng, 2021; Rodríguez-Fuertes et al., 2022; Wang et al., 2019
Idealized facial images, unattainable physical beauty, and beautification practices necessitate digital self-presentation and sociality.	Findlay, 2019; Hsu et al., 2021; Lavrence and Cambre, 2020; Millière, 2022; Ponseti et al., 2022; Wang et al., 2019; Zhang, 2022
Negative emotional states and mental attitudes can be achieved through self-monitoring and self-tracking technologies and augmented reality beauty apps.	Butt et al., 2022; Eriksson and Kenalemang, 2023; Gill, 2017; Peng, 2021; Wang et al., 2019; Whang et al., 2021

6. Socio-Cultural Norms of Idealized Facial Beauty, Favorable Appearance Evaluation, and Low Body Appreciation

Socially constructed attractiveness and appealing self-presentation can be attained through beauty filters (Butkowski et al., 2022; Luna Mora and Berry, 2021; Rodner et al., 2022; Staniewski and Awruk, 2022; Yang, 2022) in relation to facial and bodily expressions, intersecting social identities, and poor body image and self-esteem. Idealized corporeal beautification, individual and collective values, appearance and behavior codes, and socially controlled bodies can be achieved through synthetic geospatial data and beauty apps.

Low body self-esteem, visual perceptions, and physical attractiveness (Hawker and Carah, 2020; Luna Mora and Berry, 2021; Ota and Nakano, 2021; Simay et al., 2022) necessitate artificial intelligence color cosmetics apps and augmented reality-enhanced virtual try-ons in terms of beauty ideals and standards. Affectively mediated social networks integrate beauty norms, perceived facial attractiveness, and selfie-taking practices in visual digital cultures.

Visual aesthetic features, normative beauty standards, and unrealistic physical appearance (Eriksson and Kenalemang, 2023; Findlay, 2019; Peng, 2021; Peng and Gu, 2021; Rome and Lambert, 2020; Sun, 2021; Wang et al., 2019; Zhang, 2022; Zhao and Zappavigna, 2018) develop on beauty apps as regards strict body measurements. Photo-editing beauty apps, semiotic technology and biometric data further social and cultural dynamics, negative personality traits, and narcissistic self-representation. Filtered self-portrait photos configure socio-cultural norms of idealized facial beauty, favorable appearance evaluation, and low body appreciation. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Socially constructed attractiveness and appealing self-presentation can be attained through beauty filters in relation to facial and bodily expressions, intersecting social identities, and poor body image and self-esteem.	Butkowski et al., 2022; Luna Mora and Berry, 2021; Rodner et al., 2022; Staniewski and Awruk, 2022; Yang, 2022
Low body self-esteem, visual perceptions, and physical attractiveness necessitate artificial intelligence color cosmetics apps and augmented reality-enhanced virtual try-ons in terms of beauty ideals and standards.	Hawker and Carah, 2020; Luna Mora and Berry, 2021; Ota and Nakano, 2021; Simay et al., 2022
Visual aesthetic features, normative beauty standards, and unrealistic physical appearance develop on beauty apps as regards strict body measurements.	Eriksson and Kenalemang, 2023; Findlay, 2019; Peng, 2021; Peng and Gu, 2021; Rome and Lambert, 2020; Sun, 2021; Wang et al., 2019; Zhang, 2022; Zhao and Zappavigna, 2018

7. Discussion

I integrate my systematic review throughout research indicating how unachievable appearance and normative beauty ideals, physical attractiveness, and negative emotional well-being can be achieved through aesthetic and affective technologies. My research complements recent analyses clarifying how photo-editing beauty apps, semiotic technology and biometric data further social and cultural dynamics, negative personality traits, and narcissistic self-representation. I elucidate, by cumulative evidence, previous research demonstrating how self-portrait photo-taking and beauty apps enable ideal appearance management, body dissatisfaction, and facial attractiveness.

8. Synopsis of the Main Research Outcomes

Experiential augmented reality apps enable societal beauty ideals, negative body image, and favorable appearance evaluation. Self-presentation perceptions and behaviors, together with digital social practices and interactive behaviors, require machine learning-based, image processing, and semantic filtering techniques. Digital self-tracking devices and beauty apps articulate idealized facial images, body ideal internalization, and sociocultural pressures. Filtered self-portrait photos configure socio-cultural norms of idealized facial beauty, favorable appearance evaluation, and low body appreciation. Visual social networking sites and digital beauty apps integrate idealized facial and body representations.

9. Conclusions

Relevant research has investigated whether idealized corporeal beautification, individual and collective values, appearance and behavior codes, and socially controlled bodies can be achieved through synthetic geospatial data and beauty apps. This systematic literature review presents the published peer-reviewed sources covering how facial emotion recognition systems and enhanced self-portrait photos further facial appearance and societal beauty ideals and standards, body image and facial appearance dissatisfaction, and thin-ideal internalization. The research outcomes drawn from the above analyses indicate that affectively mediated social networks integrate beauty norms, perceived facial attractiveness, and selfie-taking practices in visual digital cultures.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published in journals indexed in the Web of Science, Scopus, and ProQuest databases between 2017 and 2022, relevant

sources on beauty apps and filters in visual digital cultures in terms of perceived sociocultural pressures, self-rated emotional expressiveness, and image processing algorithms may have been excluded. The scope of my study also does not move forward the inspection of bodily and facial appearances, self-modifying practices, and visual representations.

Subsequent analyses should develop on aesthetic self-tracking and self-monitoring devices in the context of standardized beauty aesthetics and appearance ideals. Future research should thus investigate synthetic geospatial data in relation to self-monitored body. Attention should be directed to artificial intelligence color cosmetics apps and augmented reality-enhanced virtual try-ons in terms of beauty ideals and standards.


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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the author. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

Data availability statement
All data generated or analyzed are included in the published article.

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Author contributions
The author confirms being the sole contributor of this work and approved it for publication. The author takes full responsibility for the accuracy and the integrity of the data analysis.

Conflict of interest statement
The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Disclosure by the editors of record
The editors declare no conflict of interest in the review and publication decision regarding this article.

Transparency statement
The author affirms that the manuscript represents an honest, accurate, and transparent account of the research being reported, that no relevant aspects of the study have been left out, and that any inconsistencies from the research as planned (and, if significant, registered) have been clarified.

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Augmented Reality Body and Face Filters for Digitally Manipulated Visual Narratives: Physical Appearance Ideals, Perceived Social Validation, and Aesthetic and Affective Technologies

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ABSTRACT. This paper provides a systematic literature review of studies investigating flawless fashionable ideals, digitally-enhanced augmented reality-based perception of beauty, and individual expressions and representations of visual identity. Throughout June 2022, we performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "augmented reality body and face filters for digitally manipulated visual narratives" + "physical appearance ideals," "perceived social validation," and "aesthetic and affective technologies." As we inspected research published between 2013 and 2022, only 169 articles satisfied the eligibility criteria. By eliminating controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, we decided upon 32, generally empirical, sources. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Distiller SR, MMAT, and ROBIS.

Keywords: augmented reality body and face filter; digitally manipulated visual narrative; physical appearance ideal; perceived social validation; aesthetic and affective technology

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1. Introduction

Photo-realistic synthetic face modeling, visual and emotional dissonances, and normative forms of attractive images and narratives shape social standards of facial and body attractiveness. The purpose of our systematic review is to examine the recently published literature on physical appearance ideals, perceived social validation, and aesthetic and affective technologies and integrate the insights it configures on augmented reality body and face filters for digitally manipulated visual narratives. By analyzing the most recent (2013–2022) and significant (Web of Science, Scopus, and ProQuest) sources, our paper has attempted to prove that sociocultural terms and contexts, media-portrayed idealized images, and normative beauty shape digital self-expression and representations. The actuality and novelty of this study are articulated by addressing creative constructions of social identities and of self-presentations, beauty standards and societal norms, and socially constructed self-monitoring standards, that is an emerging topic involving much interest. Our research problem is whether beautification practices and visual representation can be achieved through beauty apps and filters.

In this review, prior findings have been cumulated indicating that inauthentic and incongruent augmented selves develop on spatial self-expression distribution and lifestyle indicators, commodified body internalization and self-monitoring, collective values of moral consciousness, and dynamically evolving social structures. The identified gaps advance unrealistically thin and flawless bodies, inauthentic augmented reality self-images, and fashionable mediatized body and physical postures. Our main objective is to indicate that stereotypically constructed traits and identities and visual perception and appearance of reality (Andronie et al., 2021a, b; Lăzăroiu et al., 2017) enable distorted visual representations and images (Andronie et al., 2023; Nagy et al., 2023) as regards physical attractiveness in digital social interactions. This systematic review contributes to the literature on flawless fashionable ideals, digitally-enhanced augmented reality-based perception of beauty, and individual expressions and representations of visual identity by clarifying that self-objectification and facial dissatisfaction together with idealized images as social media content configure visual self-representation, shaping digital bodies and selves. This research endeavors to elucidate whether digitally fluid selves optimize unrealistic physical appearance and images, fashionable virtual body modifications, and augmented reality-based digital self-expressions.

2. Theoretical Overview of the Main Concepts

Augmented reality-based virtual try-on technology articulate sense of self-control and self-worth, visual and aesthetic sense and sensibilities, and illustrative representations and societal acceptance of the sense of body control

and knowledge. Perceptual, cognitive, and affective mechanisms, together with discriminatory beliefs and patterns of behavior assist deceptive visual self-representations in relation to marginalized individuals and communities. The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), unrealistic physical appearance and images, fashionable virtual body modifications, and augmented reality-based digital self-expressions (section 4), flawless fashionable ideals, digitally-enhanced augmented reality-based perception of reality, and individual expressions and representations of visual identity (section 5), sociocultural terms and contexts, media-portrayed idealized images, and normative beauty (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout June 2022, we performed a quantitative literature review of the Web of Science, Scopus, and ProQuest databases, with search terms including "augmented reality body and face filters for digitally manipulated visual narratives" + "physical appearance ideals," "perceived social validation," and "aesthetic and affective technologies." As we inspected research published between 2013 and 2022, only 169 articles satisfied the eligibility criteria. By eliminating controversial findings, outcomes unsubstantiated by replication, too imprecise material, or having similar titles, we decided upon 32, generally empirical, sources (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Distiller SR, MMAT, and ROBIS (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
augmented reality body and face filters for digitally manipulated visual narratives + physical appearance ideals	58	12
augmented reality body and face filters for digitally manipulated visual narratives + perceived social validation	56	10
augmented reality body and face filters for digitally manipulated visual narratives + aesthetic and affective technologies	55	10
Type of paper		
Original research	137	30
Review	11	2
Conference proceedings	15	0
Book	3	0
Editorial	3	0

Source: Processed by the authors. Some topics overlap.

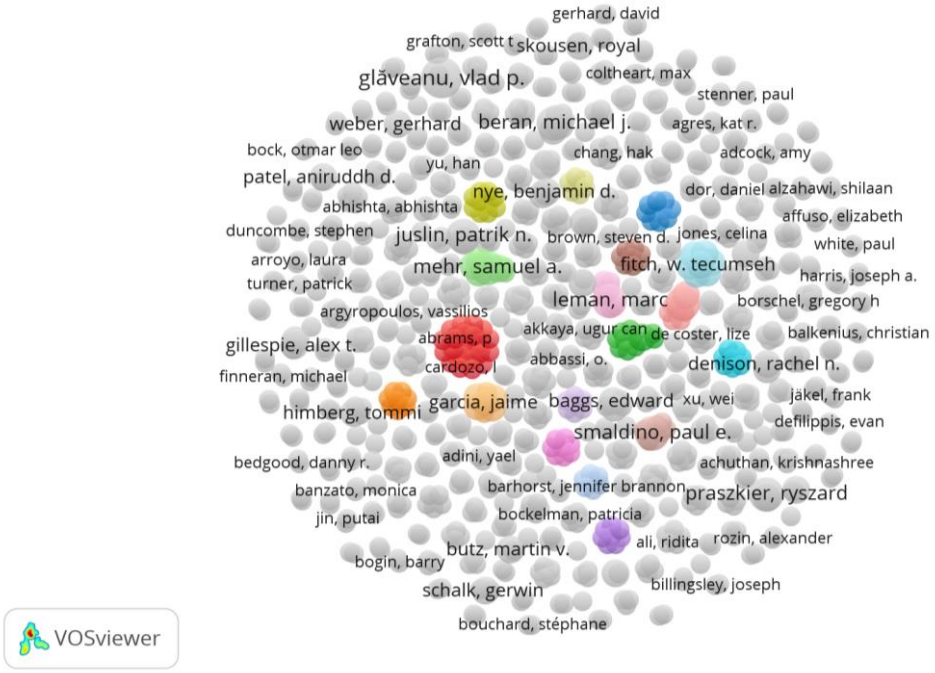


Figure 1 Co-authorship

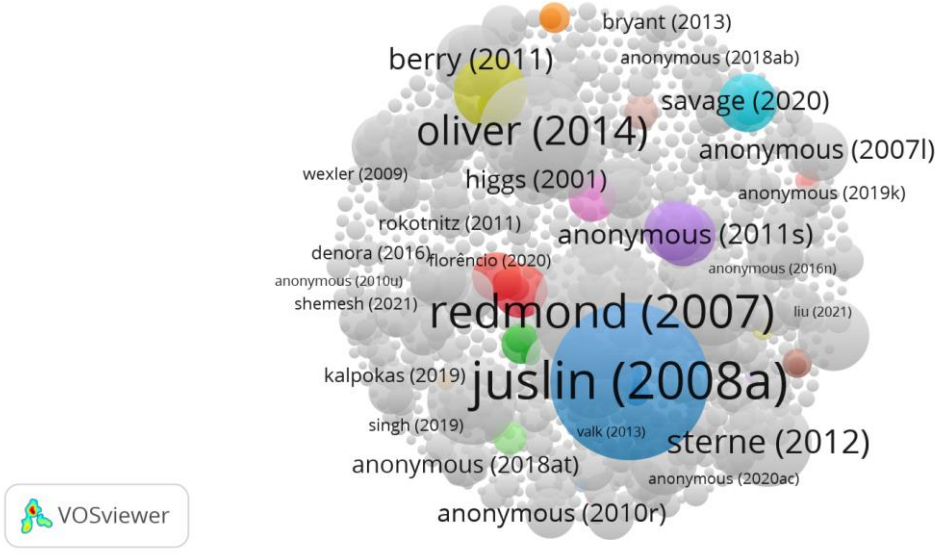


Figure 2 Citation

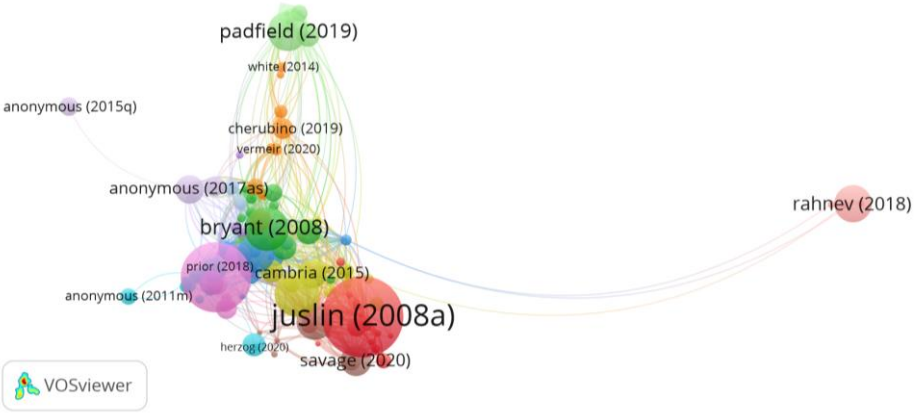


Figure 3 Bibliographic coupling

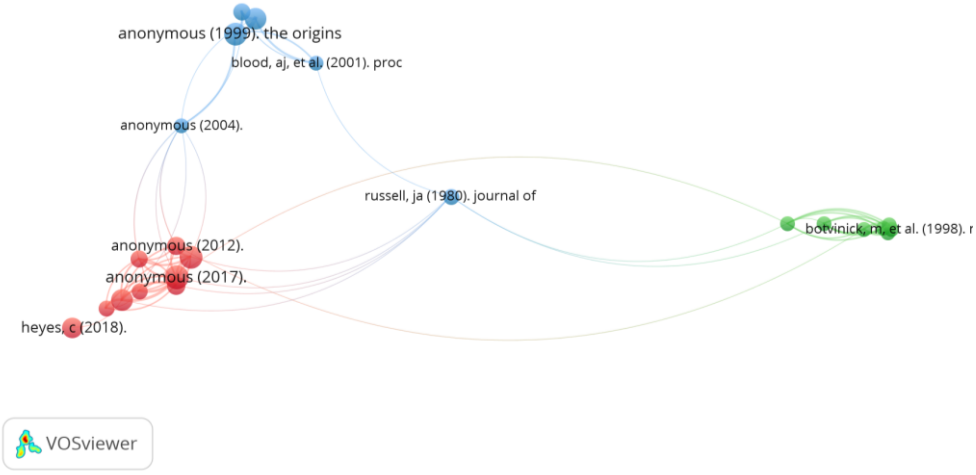


Figure 4 Co-citation

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings).

Distorted media imagery and representations, social identities and rewards, and widely shared norms and expectations configure perceived usefulness of augmented reality beauty apps.	Butkowski et al., 2022; Foster and Baker, 2022; Hwang et al., 2023; Kunst et al., 2022; Leone, 2020, Peng, 2021
Creative constructions of social identities and of self-presentations, beauty standards and societal norms, and socially constructed self-monitoring standards are pivotal in perceptual representations of digital bodies.	El-Shamandi Ahmed et al., 2023; Hawker and Carah; Padín et al., 2021; Rodner et al., 2022; Skov and Nadal, 2021; Swerzenski, 2021; Yao et al., 2021
Unrealistically thin and flawless bodies, inauthentic augmented reality self-images, and fashionable mediatized body and physical postures enable senses of social identity and aesthetic self-actualization.	El-Shamandi Ahmed et al., 2023; Evans, 2023; Luna Mora and Berry, 2021; Rodgers et al., 2022; Sun, 2021; Yao et al., 2021
Technologically-mediated image and meaning contextualization and self-tracking and self-monitoring of bodily functions further sharable visual networked content and authentic self-presentation on social media.	Evans, 2023; Findlay, 2019; Kuipers, 2022; Lavoye et al., 2023; Workman and Gupta, 2013; Zhao and Zappavigna, 2018
Digitally monitoring and modifying facial and body appearance, social identities and self-presentations, emotional and bodily control necessitate perceived usefulness of augmented reality technologies.	Butt et al., 2022, El-Shamandi Ahmed et al., 2023; Gadgil et al., 2023; Kuipers, 2022; Luna Mora and Berry, 2021; Peng, 2021
Flawless fashionable ideals, digitally-enhanced augmented reality-based perception of reality, and individual expressions and representations of visual identity articulate thin-ideal content and negative body image on social media.	El-Shamandi Ahmed et al., 2023; Findlay, 2019; Luna Mora and Berry, 2021; McGill, 2022; Vandenbosch et al., 2022; Yao et al., 2021; Zhang, 2022
Unrealistic socially internalized beauty ideals can be attained through body shame and objectification, psychological internalization of constructed, networked, and mediatized selves, body self-management, self-monitoring and self-transformation, and reality-based body enhancement technologies.	Bailey and Burkell, 2021; Degen and Kleeberg-Niepage, 2023; Luna Mora and Berry, 2021; Rodner et al., 2022; Rodríguez-Fuertes et al., 2022; Skov and Nadal, 2021; Yao et al., 2021
Aesthetic representations of beauty on social media require shifting sensibilities and tastes, symbolic and embodied features of physical appearance, and body image and self-perceived attractiveness.	Foster and Baker, 2022; Tan et al., 2022, Thai et al., 2020; Zhang, 2022
Body shame and dissatisfaction, self-objectification, negative mood, and appearance anxiety, in addition to visual content and sense-making and augmented reality reflexive self-appreciation makeup assist digitally inauthentic selves.	El-Shamandi Ahmed et al., 2023; McGill, 2022; Rodner et al., 2022

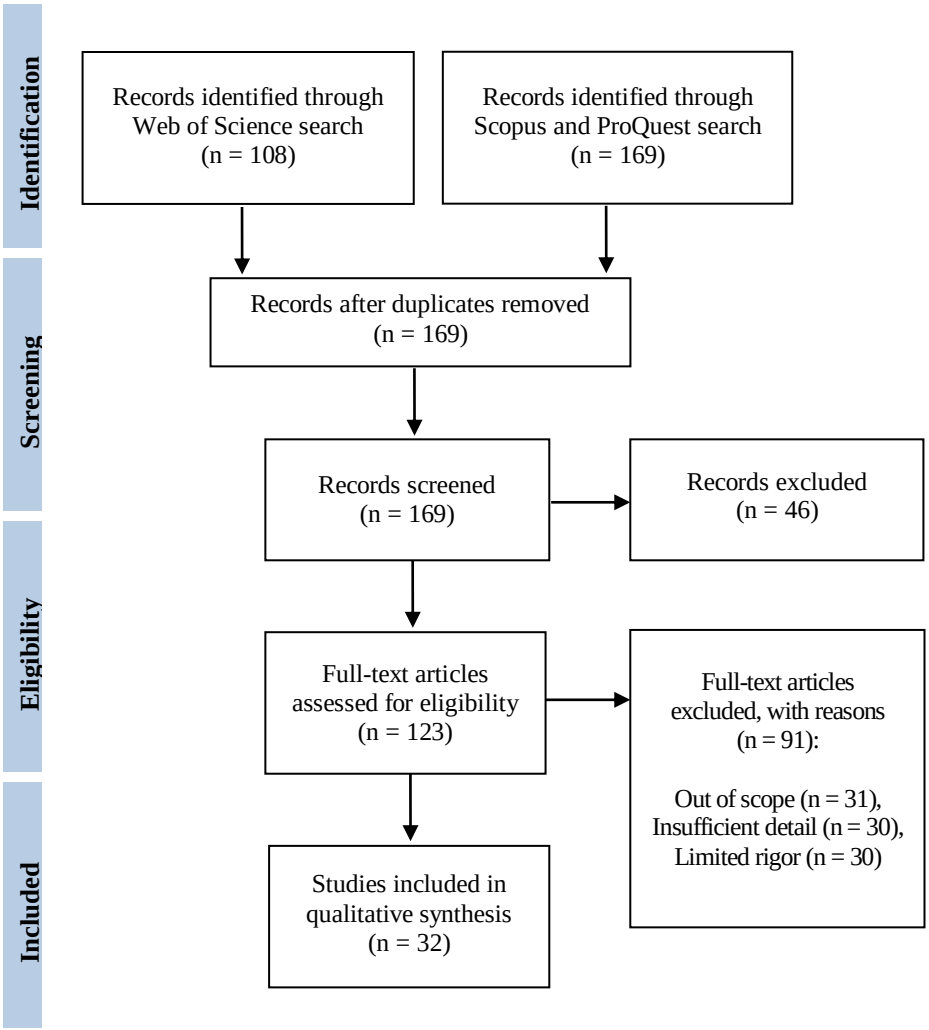


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

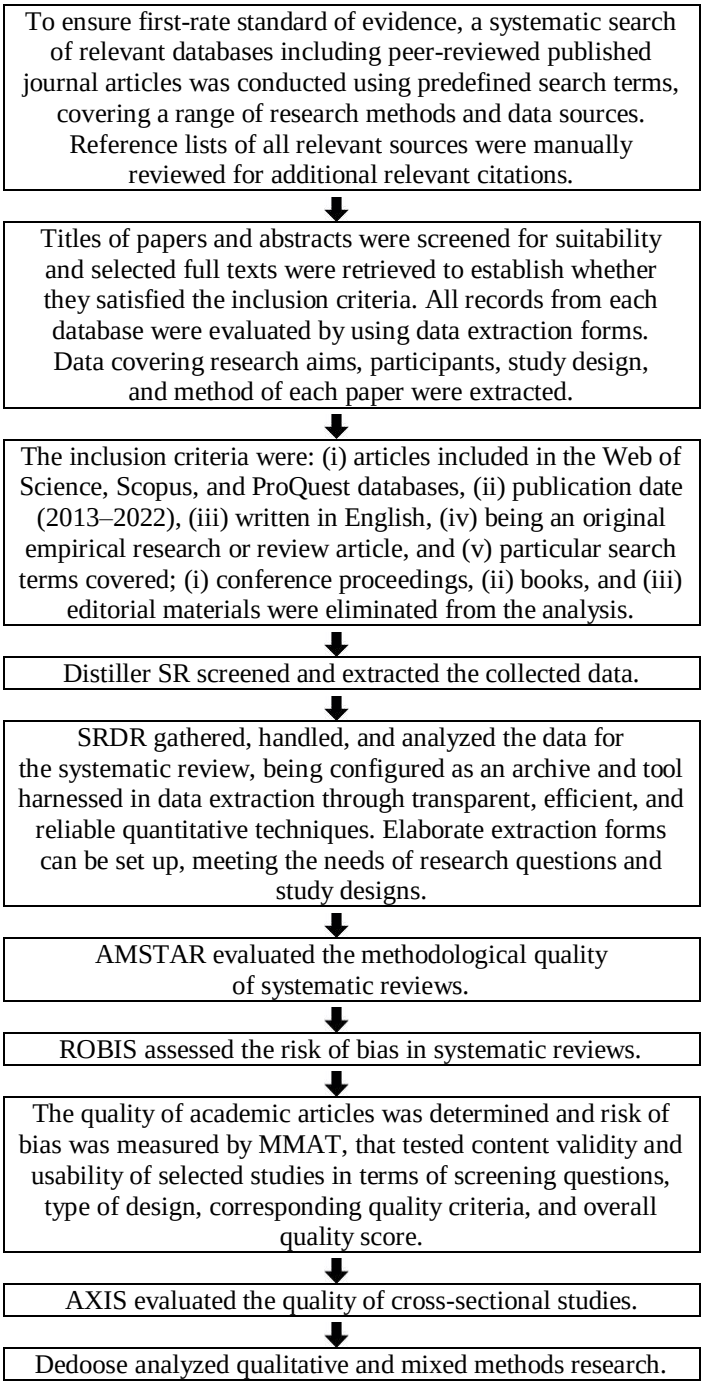


Figure 6 Screening and quality assessment tools

4. Unrealistic Physical Appearance and Images, Fashionable Virtual Body Modifications, and Augmented Reality-based Digital Self-Expressions

Distorted media imagery and representations, social identities and rewards, and widely shared norms and expectations (Butkowski et al., 2022; Foster and Baker, 2022; Hwang et al., 2023; Kunst et al., 2022; Leone, 2020, Peng, 2021b) configure perceived usefulness of augmented reality beauty apps. Stereotypically constructed traits and identities and visual perception and appearance of reality enable distorted visual representations and images as regards physical attractiveness in digital social interactions.

Creative constructions of social identities and of self-presentations, beauty standards and societal norms, and socially constructed self-monitoring standards (El-Shamandi Ahmed et al., 2023; Hawker and Carah; Padín et al., 2021; Rodner et al., 2022; Skov and Nadal, 2021; Swerzenski, 2021; Yao et al., 2021) are pivotal in perceptual representations of digital bodies. Digitally fluid selves optimize unrealistic physical appearance and images, fashionable virtual body modifications, and augmented reality-based digital self-expressions.

Unrealistically thin and flawless bodies, inauthentic augmented reality self-images, and fashionable mediatized body and physical postures (El-Shamandi Ahmed et al., 2023; Evans, 2023; Luna Mora and Berry, 2021; Rodgers et al., 2022; Sun, 2021; Yao et al., 2021) enable senses of social identity and aesthetic self-actualization. Self-objectification and facial dis-satisfaction together with idealized images as social media content configure visual self-representation, shaping digital bodies and selves. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Distorted media imagery and representations, social identities and rewards, and widely shared norms and expectations configure perceived usefulness of augmented reality beauty apps.	Butkowski et al., 2022; Foster and Baker, 2022; Hwang et al., 2023; Kunst et al., 2022; Leone, 2020; Peng, 2021
Creative constructions of social identities and of self-presentations, beauty standards and societal norms, and socially constructed self-monitoring standards are pivotal in perceptual representations of digital bodies.	El-Shamandi Ahmed et al., 2023; Hawker and Carah; Padín et al., 2021; Rodner et al., 2022; Skov and Nadal, 2021; Swerzenski, 2021; Yao et al., 2021
Unrealistically thin and flawless bodies, inauthentic augmented reality self-images, and fashionable mediatized body and physical postures enable senses of social identity and aesthetic self-actualization.	El-Shamandi Ahmed et al., 2023; Evans, 2023; Luna Mora and Berry, 2021; Rodgers et al., 2022; Sun, 2021; Yao et al., 2021

5. Flawless Fashionable Ideals, Digitally-enhanced Augmented Reality-based Perception of Beauty, and Individual Expressions and Representations of Visual Identity

Technologically-mediated image and meaning contextualization and self-tracking and self-monitoring of bodily functions (Evans, 2023; Findlay, 2019; Kuipers, 2022; Lavoye et al., 2023; Workman and Gupta, 2013; Zhao and Zappavigna, 2018) further sharable visual networked content and authentic self-presentation on social media. Augmented reality-based virtual try-on technology articulate sense of self-control and self-worth, visual and aesthetic sense and sensibilities, and illustrative representations and societal acceptance of the sense of body control and knowledge.

Digitally monitoring and modifying facial and body appearance, social identities and self-presentations, emotional and bodily control (Butt et al., 2022, El-Shamandi Ahmed et al., 2023; Gadgil et al., 2023; Kuipers, 2022; Luna Mora and Berry, 2021; Peng, 2021a) necessitate perceived usefulness of augmented reality technologies. Inauthentic and incongruent augmented selves develop on spatial self-expression distribution and lifestyle indicators, commodified body internalization and self-monitoring, collective values of moral consciousness, and dynamically evolving social structures.

Flawless fashionable ideals, digitally-enhanced augmented reality-based perception of beauty, and individual expressions and representations of visual identity (El-Shamandi Ahmed et al., 2023; Findlay, 2019; Luna Mora and Berry, 2021; McGill, 2022; Vandenbosch et al., 2022; Yao et al., 2021; Zhang, 2022) articulate thin-ideal content and negative body image on social media. Photo-realistic synthetic face modeling, visual and emotional dissonances, and normative forms of attractive images and narratives shape social standards of facial and body attractiveness. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Technologically-mediated image and meaning contextualization and self-tracking and self-monitoring of bodily functions further sharable visual networked content and authentic self-presentation on social media.	Evans, 2023; Findlay, 2019; Kuipers, 2022; Lavoye et al., 2023; Workman and Gupta, 2013; Zhao and Zappavigna, 2018
Digitally monitoring and modifying facial and body appearance, social identities and self-presentations, emotional and bodily control necessitate perceived usefulness of augmented reality technologies.	Butt et al., 2022, El-Shamandi Ahmed et al., 2023; Gadgil et al., 2023; Kuipers, 2022; Luna Mora and Berry, 2021; Peng, 2021
Flawless fashionable ideals, digitally-enhanced augmented reality-based perception of reality, and individual expressions and representations of visual identity articulate thin-ideal content and negative body image on social media.	El-Shamandi Ahmed et al., 2023; Findlay, 2019; Luna Mora and Berry, 2021; McGill, 2022; Vandenbosch et al., 2022; Yao et al., 2021; Zhang, 2022

6. Sociocultural Terms and Contexts, Media-Portrayed Idealized Images, and Normative Beauty

Unrealistic socially internalized beauty ideals (Bailey and Burkell, 2021; Degen and Kleeberg-Niepage, 2023; Luna Mora and Berry, 2021; Rodner et al., 2022; Rodríguez-Fuertes et al., 2022; Skov and Nadal, 2021; Yao et al., 2021) can be attained through body shame and objectification, psychological internalization of constructed, networked, and mediatized selves, body self-management, self-monitoring and self-transformation, and reality-based body enhancement technologies. Perceptual, cognitive, and affective mechanisms, together with discriminatory beliefs and patterns of behavior assist deceptive visual self-representations in relation to marginalized individuals and communities.

Aesthetic representations of beauty on social media (Foster and Baker, 2022; Tan et al., 2022; Thai et al., 2020; Zhang, 2022) require shifting sensibilities and tastes, symbolic and embodied features of physical appearance, and body image and self-perceived attractiveness. Beautification practices and visual representation can be achieved through beauty apps and filters.

Body shame and dissatisfaction, self-objectification, negative mood, and appearance anxiety, in addition to visual content and sense-making and augmented reality reflexive self-appreciation makeup (El-Shamandi Ahmed et al., 2023; McGill, 2022; Rodner et al., 2022) assist digitally inauthentic selves. Sociocultural terms and contexts, media-portrayed idealized images, and normative beauty shape digital self-expression and representations. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Unrealistic socially internalized beauty ideals can be attained through body shame and objectification, psychological internalization of constructed, networked, and mediatized selves, body self-management, self-monitoring and self-transformation, and reality-based body enhancement technologies.	Bailey and Burkell, 2021; Degen and Kleeberg-Niepage, 2023; Luna Mora and Berry, 2021; Rodner et al., 2022; Rodríguez-Fuertes et al., 2022; Skov and Nadal, 2021; Yao et al., 2021
Aesthetic representations of beauty on social media require shifting sensibilities and tastes, symbolic and embodied features of physical appearance, and body image and self-perceived attractiveness.	Foster and Baker, 2022; Tan et al., 2022; Thai et al., 2020; Zhang, 2022
Body shame and dissatisfaction, self-objectification, negative mood, and appearance anxiety, in addition to visual content and sense-making and augmented reality reflexive self-appreciation makeup assist digitally inauthentic selves.	El-Shamandi Ahmed et al., 2023; McGill, 2022; Rodner et al., 2022

7. Discussion

We integrate our systematic review throughout research indicating how body shame and dissatisfaction, self-objectification, negative mood, and appearance anxiety, in addition to visual content and sense-making and augmented reality reflexive self-appreciation makeup, articulate thin-ideal content and negative body image on social media. Our research complements recent analyses clarifying how inauthentic and incongruent augmented selves develop on spatial self-expression distribution and lifestyle indicators, commodified body internalization and self-monitoring, collective values of moral consciousness, and dynamically evolving social structures. We elucidate, by cumulative evidence, previous research demonstrating how perceptual, cognitive, and affective mechanisms, together with discriminatory beliefs and patterns of behavior assist deceptive visual self-representations in relation to marginalized individuals and communities.

8. Synopsis of the Main Research Outcomes

Beautification practices and visual representation can be achieved through beauty apps and filters. Stereotypically constructed traits and identities and visual perception and appearance of reality enable distorted visual representations and images as regards physical attractiveness in digital social interactions.

9. Conclusions

Relevant research has investigated whether sociocultural terms and contexts, media-portrayed idealized images, and normative beauty shape digital self-expression and representations. This systematic literature review presents the published peer-reviewed sources covering how photo-realistic synthetic face modeling, visual and emotional dissonances, and normative forms of attractive images and narratives shape social standards of facial and body attractiveness. The research outcomes drawn from the above analyses indicate that digitally fluid selves optimize unrealistic physical appearance and images, fashionable virtual body modifications, and augmented reality-based digital self-expressions.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published in journals indexed in the Web of Science, Scopus, and ProQuest databases between 2013 and 2022, relevant sources on augmented reality body and face filters for digitally manipulated visual narratives in terms of physical appearance ideals, perceived social

validation, and aesthetic and affective technologies may have been excluded. The scope of our study also does not move forward the inspection of body shame and objectification, psychological internalization of constructed, networked, and mediatized selves, body self-management, self-monitoring and self-transformation, and reality-based body enhancement technologies.

Subsequent analyses should develop on perceptual representations of digital bodies. Future research should thus investigate aesthetic representations of beauty on social media. Attention should be directed to technologically-mediated image and meaning contextualization and self-tracking and self-monitoring of bodily functions.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the authors. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

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The authors affirm that the manuscript represents an honest, accurate, and transparent account of the research being reported, that no relevant aspects of the study have been left out, and that any inconsistencies from the research as planned (and, if significant, registered) have been clarified.

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