



Swipe right? Using beauty filters in male Tinder profiles reduces women's evaluations of trustworthiness but increases physical attractiveness and dating intention

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ABSTRACT

Mobile dating apps are popular platforms to initiate romantic relationships that provide several means for idealized self-presentation—such as the possibility to modify one's photos with the help of beauty filters. Connecting and extending prior theory and research, a model on the influence of filter use on potential dating partners' perceived trustworthiness and attractiveness is proposed. We conducted a pre-registered online experiment ($N = 241$), showing that (hetero- or bisexual) women perceive male Tinder users with filtered photos (as compared to the same users with unfiltered photos) as more physically attractive—but as less trustworthy. The more attractive and trustworthy the profile owner was perceived, the more likely the women were inclined to date him. Attractiveness had a greater influence on women's dating intention than trustworthiness, leading to a positive overall effect of filter use on dating intention, irrespective of photo-editing experience. Implications are discussed.

1. Introduction

Many short-term and long-term relationships are formed online, and mobile dating applications such as *Tinder* are particularly popular (McClain & Gelles-Warnick, 2023). In this context, users typically have ample opportunities for impression management, particularly at the early stages when daters attempt to connect with another person (i.e., the *discovery phase*, Markowitz et al., 2018; see also Finkel et al., 2012). Most notably, the proliferation of easy-to-handle editing software allows users to edit their profile pictures with the help of beauty enhancement filters, a behavior aimed at increasing the likelihood of contact (e.g., the probability that potential partners signal dating intentions by *swiping right* in order to create a 'match' on *Tinder*). The use of filters on mobile dating apps and other social media has become widespread in recent years—and the on-going progress in artificial intelligence will likely add to this trend (e.g., Allyn, 2023; Javaid, 2023). Empirical studies on the causal effects of using filters in online or mobile dating are missing, a research lacuna addressed by this work. Our focus was on women's responses to male beauty filter use. Connecting different lines of theory (e.g., *social information processing theory*, Walther, 2016) and research on idealized self-presentation (self-enhancement) in the dating context (e.

g., Fink et al., 2023; Hancock & Toma, 2009; McGloin & Denes, 2018; Toma & Hancock, 2010; Wotipka & High, 2016) to the impression formation literature (most notably literature on the '*beautiful is good*'-effect, Dion et al., 1972; Han & Laurent, 2023), we suggest a Janus-faced effect of beauty filter use: Men who use beauty filters may not only increase their attractiveness as perceived by hetero- or bisexual women, but also reduce impressions of trustworthiness, leading to positive (via attractiveness) and negative (via trustworthiness) downstream effects on dating intentions. We report the results of an online experiment based on *Tinder* profiles, in which we compared responses to profiles with unedited pictures to responses to the same profiles with pictures edited via a popular, free, and easy-to-use software (*FaceApp*). Participants' photo-editing experience served as a potential moderating variable.

1.1. Visual self-presentation in mobile dating profiles

Self-presentation on online and mobile dating platforms differs in key regards from self-presentation in face-to-face dating (*selective self-presentation perspective*, e.g., Walther, 1996, 2007). Self-presentation activities are guided by several technological affordances that facilitate control over any self-related messages sent by the user. In addition

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to *asynchronicity* (more time to craft messages) and the *reallocation of cognitive resources* (more cognitive resources to craft messages), these affordances mainly include an increased *editability* of messages (Toma & D'Angelo, 2017)—an aspect that applies to both visual and verbal elements of online self-presentation. Yet, with today's mobile dating apps clearly geared towards visual cues (e.g., Degen & Kleeberg-Niepage, 2022; Wu & Trotter, 2022), the editability of users' pictures to improve their self-presentation emerges as a particularly relevant aspect of modern mobile dating. Popular mobile dating apps such as Tinder are heavily based on quick visual impressions, as users typically swipe left or right within a few seconds to decide if they want to date the depicted person (Ward, 2017). These affordances create a tension between mobile dating app users' aim to present themselves in most positive ways (idealized self-presentation) and their aim to appear authentic (for a similar perspective on online dating, see Ellison et al., 2006; Ellison et al., 2012; Hancock & Toma, 2009).

Idealized visual self-presentation practices on mobile dating apps can take many forms (Toma & Hancock, 2010). This includes out-of-the-ordinary practices before shooting and uploading a photograph, such as make-up, flattering hairstyle, and clothing as well as professional photography and lighting (McGloin & Denes, 2018). Another common practice is the selection of older photographs in which daters display their younger (and possibly more attractive) selves (Toma & Hancock, 2010). A clear case of deception would be using the images of some other, supposedly more attractive person to present oneself (*catfishing*, e.g., Simmons & Lee, 2020). Catfishing clearly violates the psychological contract that online and mobile daters engage in (Ellison et al., 2012), as this psychological contract includes the mutual expectation that the person "does not differ fundamentally from the person represented by the profile" (*profile as promise*, Ellison et al., 2012, p. 56).

A rather recent form of idealized visual self-presentation is the use of beauty filters, a feature that is either implemented directly within online platforms or available through easy-to-use apps. Beauty filters enable users to optimize their physical appearance with a few clicks. Without much effort or expertise, teeth are whitened, skin imperfections are removed, and even facial features such as the height of the cheekbones, the contour of the jawline, or the shape of the nose can be modified (Elias & Gill, 2018; Rodner et al., 2022). Existing research on beauty filter use focuses mostly on potential reasons for using filters in the first place, and the effects of using them on the users themselves (e.g., Hering et al., 2022; Javornik et al., 2022; Tiggemann et al., 2020; Vendemia & DeAndrea, 2021; Wang & Yu, 2023). Our emphasis is on the effects on dating partners: How do profile pictures with applied beauty enhancement filters affect potential dating partners' perceptions of attractiveness, trustworthiness, and dating intentions?

1.2. A focus on Women's judgments

More specifically, our focus is on hetero- or bisexual women and their judgments of male dating profiles on the popular dating app Tinder. In contrast to classical makeup, which is stereotypically associated with femininity, beauty filters are frequently used by all genders, including men (Kozłowska, 2021; Maes & de Lenne, 2022). Moreover, the respective apps typically offer filters that are specifically designed for men and that enable, for instance, thickening the beard or lowering the hairline. Beauty filters therefore provide a unique opportunity to examine the effects of uncomplicated visual self-enhancement practices of men on the impression by hetero- or bisexual women. From an evolutionary perspective, it has been argued that male social status and height are more important in a dating context than male facial attractiveness (e.g., Hitsch et al., 2010). However, newer research suggests that gender differences observed with online dating on a desktop computer are likely reduced in the mobile context, where visual information is of increased importance compared to verbal information (Fink et al., 2023). Thus, it seems important to increase our knowledge on the influence of male visual self-presentation on hetero- or bisexual women.

We refrained from complementing this focus with a (hetero- or bisexual) male perspective or other queer/non-cisgender perspectives. The main reason underlying this decision was the difficulty, bordering impossibility, of creating conditions that allow for a valid inference on gender differences—as the different stimuli required would have added uncontrolled third-variable influence. For instance, one such source of error variance is target age, as gender affects the preferred target age group for dating processes: Heterosexual men in their twenties have a higher tolerance for younger women and lower tolerance for older women than women in their twenties do for their partners (Schwarz & Hassebrauck, 2012). Thus, target age needed to be adapted to reduce error. Target age, however, could affect the influence of beauty filters on dependent variables, creating another source of error variance. In addition, beauty filters for men and women are based on different enhancement algorithms (Kozłowska, 2021; Maes & de Lenne, 2022), which may affect the results in ways that are difficult, if not impossible, to gauge and control with the help of pilot studies or otherwise. Even without the explicit goal of identifying gender differences, we felt that including different conditions for women and men would have obfuscated the validity of all interpretations made.

1.3. Using beauty filters to increase perceived attractiveness

Social information processing theory (Walther, 1992, 2016) highlights the importance of visual and textual cues in computer-mediated communication. According to Walther (2016, p. 3), "individuals use whatever cue systems they have at their disposal in order to foster and detect impressions, and to manage levels of relational definition and development." Such cues are particularly relevant in the discovery phase of online dating, as meeting a stranger is associated with high uncertainty (Toma & D'Angelo, 2017) and vulnerability (Gibbs et al., 2011). Prior research showed that photographs in classic online dating profiles are not the only (e.g., Fitzpatrick et al., 2016), but highly relevant cues (e.g., Gibbs et al., 2011; Heino et al., 2010); and, given the affordance of mobile communication apps, pictures can be considered a prime cue for impression formation (e.g., Degen & Kleeberg-Niepage, 2022). The aim of the present research is to connect the selective self-presentation perspective (Walther, 1996, 2007) and social information processing theory (Walther, 1992, 2016) to explore how the contemporary use of beauty filters as a practice of idealized digital self-presentation affects impressions and behavioral intentions by potential romantic partners.

In terms of relevant outcomes, we first highlight that photographs are key to forming an impression about the *attractiveness* of a potential partner. Since attractive people are not only deemed as desirable sexual partners, but also tend to be associated with better jobs, higher income, and more friends (Dion et al., 1972; Langlois et al., 2000; see more below), physical attractiveness is an important driver for initiating relationships and, in turn, counts as a precursor of online dating success (e.g., Lo et al., 2013). Accordingly, studies that focused on online dating profiles have found that the perceived attractiveness of a person as portrayed by their profile picture is positively associated with dating success (e.g., Hitsch et al., 2010; Toma & Hancock, 2010; van der Zanden et al., 2022). Note, however, that most prior studies on attractiveness and dating success did not focus on the effect of idealized self-presentations; rather, pictures of different more or less attractive individuals (e.g., as rated in a pre-test) were presented.

As outlined above, the selection and editability of photographs add to the behavioral arsenal of dating individuals (Walther, 2007). Thus, the question emerges whether the practice of idealized self-presentation on photographs improves attractiveness. In the online and mobile dating context, classic means of self-enhancement appear to be beneficial regarding perceived attractiveness: When a woman was photographed professionally for her dating profile (wearing make-up and with her hair styled), perceived attractiveness by male observers was increased (McGloin & Denes, 2018). In the same study, a man photographed with a broad, toothy smile, even-looking hair and skin, wearing a casual outfit,

and leaning toward the camera was perceived to be more attractive by women than the same man photographed wearing no shirt, with unkempt hair and a smile without teeth. This demonstrates that classic means of self-enhancement increase attractiveness in an online dating setting.

To this day, experimental studies that investigate the impact of self-enhancement practices on impression formation of potential partners in the mobile dating context are very rare (Konings et al., 2022; Toma & D'Angelo, 2017). To examine the hitherto unexplored effect of male beauty filter use on women's evaluations, an experiment was conducted in which we compared the effects of edited versus unedited photographs. Based on the reviewed theory and evidence in the broader research realm, we expected that the use of beauty filters will increase the perceived attractiveness of heterosexual males' dating profile pictures:

H1. Male profile photos with beauty filters will increase women's perceived physical attractiveness of the dating profile as compared to male profile photos without beauty filters.

1.4. Beautiful is good? Beauty filters and trustworthiness in mobile dating

Trustworthiness can be defined as "the degree to which an audience perceives the assertions made by a communicator to be ones that the speaker considers valid" (Pornpitakpan, 2004, p. 244). As a central concept during interpersonal impression formation, trustworthiness serves an important role when searching for a suitable partner and building a fulfilled romantic relationship (Ellison et al., 2012; Fletcher et al., 1999; Mogilski et al., 2019; Valentine et al., 2020). Importantly, practices of idealized self-presentation with the goal to improve perceived attractiveness could also influence perceived trustworthiness as a collateral effect. The direction of this effect, however, is an open question, as theory and research point into opposite directions as to whether idealized visual self-presentation practices on mobile apps increase or decrease trustworthiness.

The first line of reasoning dates back to classic studies of the 1970s (e.g., Dion et al., 1972). The underlying theory posits that humans possess the stereotyped notion that individuals of higher physical attractiveness have more desirable characteristics in a range of other fields (Dion et al., 1972; Rosenberg & Sedlak, 1972; see also Miller, 2011). Relatedly, the *halo effect* predicts that certain global judgments of a person may affect other evaluations of that person as well (Nisbett & Wilson, 1977). Indeed, when participants rated pictures of attractive (vs. average or less attractive) individuals, the target individuals were ascribed better jobs, more desirable personality characteristics, and happier marriages (Dion et al., 1972). These and other results suggest that classic aphorisms (e.g., "What is beautiful is good", Sappho, 630–570 BCE, or "Physical beauty is the sign of an interior beauty, a spiritual and moral beauty", Schiller, 1882, as cited in Dion et al., 1972) are indeed echoed by people's lay theories of person characteristics, shaping their impression formation (Hatfield & Sprecher, 1986). Early meta-analytic results (Eagly et al., 1991) showed that attractiveness has a strong influence on the evaluation of social competence and interpersonal evaluations in general. The influence of attractiveness on variables of perceived integrity, an aggregate category for honesty (trustworthy, honest) and respect for norms (faithfulness to spouse), was positive, albeit smaller than on variables in other categories. Summarizing more recent research, Gutiérrez-García et al. (2019) highlight a close positive relationship between perceived facial attractiveness and perceived trustworthiness, based on psychological (Oosterhof & Todorov, 2008; Xu et al., 2012) and neurophysiological (Bzdok et al., 2011; Mende-Siedlecki et al., 2013) studies. In line with these basic impression formation results (see also Klebl et al., 2022; Zhao et al., 2015), persuasion research has acknowledged source attractiveness as a predictor of positive responses towards an incoming message (e.g., as part of the *source credibility model*, Hovland & Weiss, 1951). Against this background, online influencers' facial attractiveness was identified as a

main precursor of brand trust (rather than expertise, Wiedmann & Von Mettenheim, 2020). In sum, from a classic 'beautiful is good' perspective, self-presentation practices on mobile apps that increase perceived attractiveness should have a positive effect on trustworthiness.

The second line of theory and research, however, suggests negative effects of idealized visual self-presentation in mobile dating apps on trustworthiness. Adding more nuance to the abovementioned findings, researchers followed up on the fact that the impact of facial attractiveness tends to vary with the attribute that observers currently judge (Eagly et al., 1991). Specifically, Han and Laurent (2023) found that facial attractiveness not only increased perceptions of sociability—with positive downstream effects on moral evaluations—but also increased perceived vanity, which created negative downstream effects on moral evaluations. With trustworthiness encapsulating a core virtue of human morality, this arguably suggests that the connection between appearance-related impressions and judgments of trustworthiness are actually far more complex. In fact, this holds particularly true for situations in which observers have to question whether the perceived attractiveness of their communication partner is completely natural—or the product of idealized self-presentation practices.

Indeed, given the technological affordances and opportunities for self-enhancement in the online dating context, previous research has revealed trustworthiness as a central issue among mobile dating users (Toma & D'Angelo, 2017). Research showed that heterosexual women have more concerns about inauthenticity and take more precautions when meeting a person they had first encountered online (Facebook) than offline (Cali et al., 2013). Likewise, trust appears to be particularly low regarding mobile dating platforms. In a series of studies, profiles on Tinder were rated to be less trustworthy than profiles of the same individuals on a classic, desktop-oriented dating platform (Parship) or on Facebook (Silva et al., 2019). Wotipka and High (2016) manipulated written self-descriptions on online dating profiles and showed that idealized self-presentation via self-praise (high versus low, e.g., having "an amazing network of 6 or 7 friends," versus "3 or 4 close friends") elicited lower trust and social attraction.

More directly speaking to visual self-presentation effects, McGloin and Denes (2018) reported a complex result. Overall, idealized photos yielded lower trustworthiness ratings than non-idealized photos. This effect was mainly driven by men, who perceived a woman depicted in an idealized photo (soft lighting, make up, hair styled) to be *less* trustworthy than the same woman in a low self-enhancement condition (average lighting, no make-up, hair pulled back and not styled). Women showed the tendency to perceive a man depicted in a self-enhanced photo (broad, teathy smile, hair and skin looking even, casual outfit) to be *more* trustworthy than the same man in a low self-enhancement condition (photographed wearing no shirt, with unkempt hair, and a smile without teeth).¹

In sum, we observe two competing lines of theory and research: The first suggesting that visual cues that increase attractiveness should also increase trustworthiness (e.g., Dion et al., 1972; Eagly et al., 1991; Klebl et al., 2022; Wiedmann & Von Mettenheim, 2020), and the second indicating that idealized self-presentation in general, and the use of beauty filters in particular, might actually reduce trustworthiness (e.g., Wotipka & High, 2016). In this vein, we put forward two undirected hypotheses, one for the causal influence of beauty filters on trustworthiness, and the other for the association between perceived attractiveness and trustworthiness.

H2. Women's perceived trustworthiness of male dating profiles differs between both conditions (use vs. no use of beauty filters).

¹ Note that we interpret these gender differences with great caution. This study is an example of the possible third variable influence outlined above: Stimuli and gender variance are impossible to disentangle, given that the stimulus sets for female and male participants needed to differ.

H3. Perceived physical attractiveness is associated with perceived trustworthiness.

1.5. How do filter effects on attractiveness and trustworthiness translate to dating intentions?

Several factors influence the dating intentions of individuals (see, e.g., Schwartz, 2013), with physical attractiveness of a potential dating partner being of particular importance (for meta-analyses, see Kreager et al., 2014; Lee et al., 2008) — a tendency that also holds true for online and mobile dating (Bruch & Newman, 2018; Zhang et al., 2022). Crucially, perceived physical attractiveness is closely related to overall perceived attractiveness, both offline and online: That is, if a person is not attracted to a profile picture, they are less likely to be attracted to the profile at all (e.g., McGloin & Denes, 2018). Against this background, we hypothesize:

H4. Higher perceived physical attractiveness of the male dating profiles is associated with a higher dating intention among women.

As argued above, however, online dating profile pictures are not only used to evaluate the physical appearance of a person but may also affect perceived trustworthiness, which in turn might also influence users' dating intention (e.g., McGloin & Denes, 2018; Toma, 2010). In fact, perceived trustworthiness has repeatedly been identified as a key predictor for the willingness to actually meet the other person (Shah & Swaminathan, 2008; Singh et al., 2015). This leads us to the next hypothesis:

H5. Higher perceived trustworthiness of the male dating profiles is associated with a higher dating intention among women.

Based on our assumption that both attractiveness and trustworthiness influence female users' dating intention, however, the following research question arises:

RQ1. Does perceived physical attractiveness or perceived trustworthiness have a greater influence on women's dating intention?

In summary, the relationships proposed in H1 and H2 (a-paths), as well as H4 and H5 (b-paths) form a parallel mediation model, as depicted in Fig. 1. Based on the direction of the assumed effects, opposite

indirect pathways from the filter condition via attractiveness and trustworthiness could occur. In addition to these indirect effects, however, the main or total effect of using beauty filters on dating intention is of interest.

RQ2. Does the use of filters in male profile photos have an effect on women's dating intention?

1.6. The role of photo-editing experience

Considering that different people engage in photo-editing practices more or less frequently, it seemed important to investigate whether the effects of beauty filters on perceived attractiveness and trustworthiness are moderated by photo-editing experience. On the one hand, one could argue that higher photo-editing experience improves the recognition of image manipulation, leading to the classification of the person in a photo as untrustworthy. However, one could also argue that a greater level of photo-editing experience is associated with a more positive attitude towards beauty filters. Hence, individuals who frequently apply filters themselves might perceive edited images as more attractive.

Although there are no studies investigating the role of photo-editing experience in the context of online dating, there is evidence from other areas of research that lends credibility to both lines of reasoning. In the context of fake news, it was shown that individuals with more photography and digital imaging experience rated photoshopped images in news articles as less credible compared to individuals with lower skill levels (Shen et al., 2019). In contrast, some evidence suggests that people with experience in computer imaging software are more likely to perceive edited newspaper photos as credible than individuals without the respective experience (Greer & Gosen, 2002). Against this background, we decided to address this potential moderator in the form of an open research question:

RQ3. Does women's photo-editing experience predict the difference between conditions (use vs. no use of beauty filters) in terms of

- a the perceived physical attractiveness of the male profiles?
- b the perceived trustworthiness of the male profiles?

This last research question completes our theoretical model, which

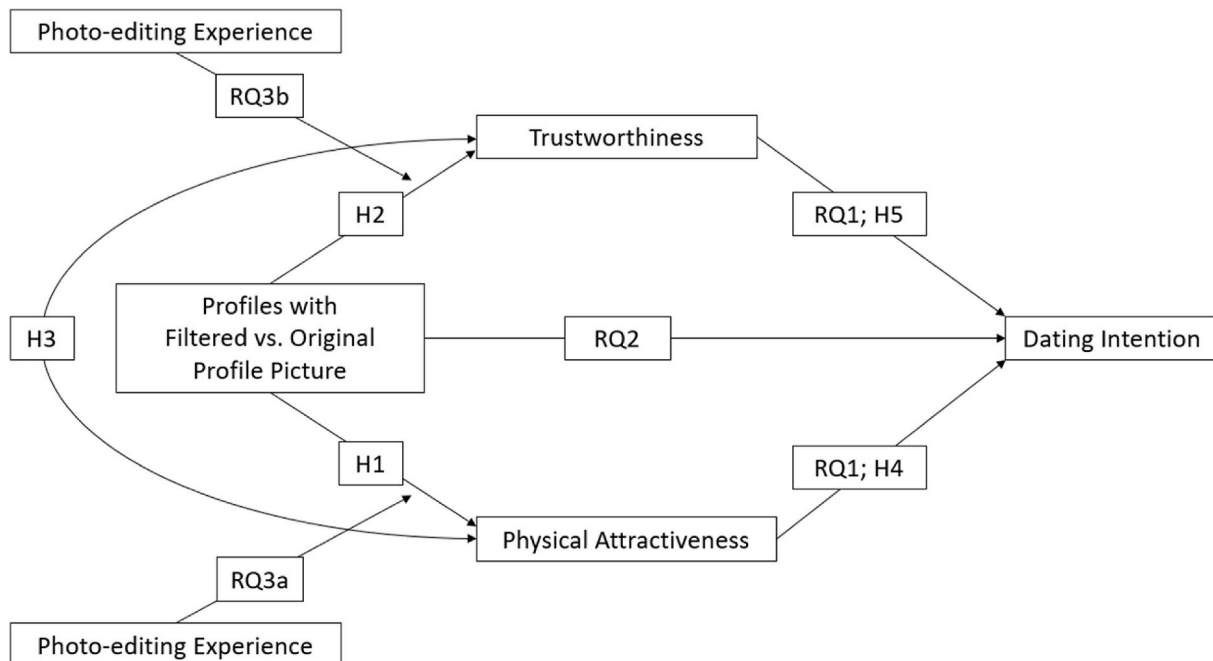


Fig. 1. Theoretical model of the study.

served as the foundation for our empirical study. Fig. 1 illustrates the independent and dependent variables with the above-mentioned hypotheses and research questions. All hypotheses and research questions were pre-registered (https://aspredicted.org/W84_718, see also Supplement S1). The supplement, data, and code are provided at <https://osf.io/qtnu3/>.

2. Method

2.1. Participants

The required sample size to detect a small ($d = 0.2$) within-subjects mean difference amounted to 199 participants, given $\alpha = 0.05$ and power of $(1 - \beta) = 0.80$ (G*Power; Faul et al., 2009). To adjust for careless responding and accidental participations by non-target demographic groups, a total of 280 participants were recruited via the *Prolific* participant pool (compensation was £0.80). The target sample was specified to be female, single, between 20 and 28 years old, and heterosexual or bisexual. Moreover, participants needed to be fluent in English and currently residing in the UK, USA, Canada, Ireland, Australia, or New Zealand. All participants gave informed consent.

Participants were excluded from the final analyses if they indicated any other gender than female (1 participant), were younger than 20 or older than 28 years (3 participants), stated a different sexual orientation than heterosexual or bisexual (7 participants), indicated any other relationship status than single (25 participants) or answered the attention check item (“tick answer number 7”) incorrectly (1 participant). Another two participants were removed from the sample, because they needed less than 120 s to complete the questionnaire, which was deemed as a further indication of careless responding (Huang et al., 2012). As such, the final sample consisted of 241 female participants (age $M = 23.26$, $SD = 2.47$). In terms of ethnic background, 155 participants were White/Caucasian, 36 were Asian American, 17 were African American, 9 were Hispanic/Latinx Americans, 11 were bi- or multiethnic, and 13 participants indicated ‘other’.

Note that the sample size of 241 should provide enough power not only for the mean difference the a priori sample size calculation was based upon, but also for testing the hypothesized associations (i.e., associations stabilize in typical scenarios with a sample size of 200–250 participants, Schönbrodt & Perugini, 2013). Mediation analyses appear to have a higher power than constituting main effects or association analyses (Kenny & Judd, 2014). We do acknowledge that the power to detect interaction effects (RQ3) is smaller than the power to detect the other effects.

2.2. Experimental stimuli

Stimulus selection and creation was based on an extensive pilot study, which is reported in detail in Supplement S2. Our initial pool of potential study stimuli consisted of ten unedited photos showing ten different young men (all men agreed to the use and publication of their pictures for the purpose of this research). Each photo was edited with the help of a popular easy-to-use software (*FaceApp*). This resulted in a stimulus pool of ten original (unedited) and ten edited photos of the same men (20 photos in total). A pilot study was conducted on *Prolific* to analyze and select the most suitable stimuli. Pilot study participants ($N = 42$ women with the same demographics as the participants in the main study) rated each of the 20 pictures in terms of physical attractiveness and perceived visual enhancement. Males whose unfiltered pictures were (erroneously) perceived as somewhat edited by the participants or whose filtered photos were perceived as either barely or extremely enhanced were considered unsuitable for the main experiment. Based on the pilot study results, the pictures of four men were selected for the main experiment.

Next, each of the selected pictures was integrated into the screenshot of a Tinder profile as it would look on an iPhone 12 Pro. In addition to

the picture, the profiles included the name of the supposed male Tinder user and his age. The ascribed age ranged between 24 and 26 years (which falls into the preferred age range for women between 20 and 28 years of age, Schwarz & Hassebrauck, 2012). The names were selected from a list of the most frequent first names of men born around 1995 in the US. The stimuli are depicted in Supplement S3. The main study participants were randomly exposed to two profiles with original (unedited) pictures and to two profiles with edited pictures (in balanced order, see Supplement S4). The randomization algorithm guaranteed that every man was only shown once, so that a participant who, for instance, saw the Tinder profile of Ryan in its unedited form, did not see the same profile with the edited picture.

2.3. Measures

Unless indicated otherwise, all following measures had to be filled in using seven-point Likert scales (ranging from 1 = *absolutely not* to 7 = *absolutely*). Skew and kurtosis of the measures did not substantially deviate from a normal distribution (see Supplement S5).

Dating intention. Participants’ intention to date the person based on their Tinder profile was measured by asking: “Would you swipe right? i.e., Would you be interested to date this person?”. This item was developed for the purpose of this study and mimics real dating situations on Tinder, where swiping right means being interested in chatting or meeting the person represented by the profile (for one-item dating intention measures, see for example Li et al., 2013; Ranzini & Rosebaum, 2020). The observed mean across all participants and profiles was $M = 3.60$, with a standard deviation of $SD = 1.12$.

Physical attractiveness. We measured the perceived physical attractiveness ascribed to the depicted person with a modified version of the Physical Attraction subscale from the Interpersonal Attraction Questionnaire (McCroskey & McCain, 1974). Our version consisted of three self-report items (i.e., “This person is physically attractive,” “I think this person is handsome,” “This person is very good looking”). Scores for the three items were averaged so that higher numbers indicated higher perceived physical attractiveness (internal consistency ranged from Cronbach’s $\alpha = 0.96$ to $\alpha = 0.97$ for the four male profiles; $M = 4.25$, $SD = 1.02$).

Trustworthiness. We measured the perceived trustworthiness ascribed to the person shown on the profile with a modified version of the Trustworthiness scale by McCroskey and Teven (1999). Our adapted scale consisted of three items (“The person seems trustworthy to me,” “This person conveys an honest impression,” “The person looks genuine to me”). Scores for the three items were averaged so that higher numbers indicated higher perceived trustworthiness (internal consistency ranged from Cronbach’s $\alpha = 0.92$ to $\alpha = 0.95$ for the four male profiles; $M = 4.46$, $SD = 0.91$).

Photo-editing experience. Photo-editing experience was measured by using a selection of items from the Photo-editing Frequency subscale of the Photo-Editing Questionnaire (PHED; O’Neill, 2021). Three self-report items of the subscale, which best suited the study context, were chosen (i.e., “How often do you apply photo editing techniques before posting selfies on social media? (i.e., smoothing skin, adjusting contrast, using filters),” “How often do you post completely unedited or unchanged photos onto social media?” (reverse-scored), “Would you feel the need to edit your photos before posting it online?”). Each question was answered on a seven-point Likert scale ranging from *never* (1) to *always* (7). Higher scores of the averaged scale indicated more photo-editing experience ($\alpha = 0.80$, $M = 3.48$, $SD = 1.55$).

2.4. Procedure and design

After obtaining informed consent, each participant saw four Tinder profiles of four different male targets (as outlined above, two of the profiles contained an unedited picture, two of the profiles contained an edited picture). Each profile was presented on a separate page along

with the measures of dating intention, physical attractiveness and perceived trustworthiness. Next, photo-editing experience, a careless responding check, and demographics were assessed. Dependent variable scores for the two profiles with edited pictures and for the two profiles with the original pictures were averaged. Thus, the experiment followed a one-factorial within-subjects design (profile with original versus edited picture).²

3. Results

3.1. Main effects of the beauty filter condition

We expected that perceived physical attractiveness was higher for profiles with a filtered picture compared to profiles with an original picture and that perceived trustworthiness differed between profiles with a filtered and an original picture (H1 and H2). The effect of filters on dating intention was addressed as a research question.

In the first step of our analyses, we averaged the scores for the profiles with the two unedited pictures as well as the scores for the profiles with the two edited pictures (for separate profile results see Supplement S6). Next, we conducted repeated measures *t*-tests for statistical inference, calculating Hedges' *g_{av}* as the effect size (following recommendations by Lakens, 2013, who compared different effect size indices in repeated measures designs). The main effects are illustrated in Fig. 2.

In support of Hypothesis 1, we found that perceived physical attractiveness was significantly higher for profiles with a filtered picture ($M = 5.14, SD = 1.11$) compared to profiles with an original picture ($M = 3.36, SD = 1.25$), $t(240) = 23.10, p < .001$, Hedges' $g_{av} = 1.50$. Also, consistent with Hypothesis 2, there was a significant difference between trustworthiness scores of profiles with a filtered picture ($M = 4.34, SD =$

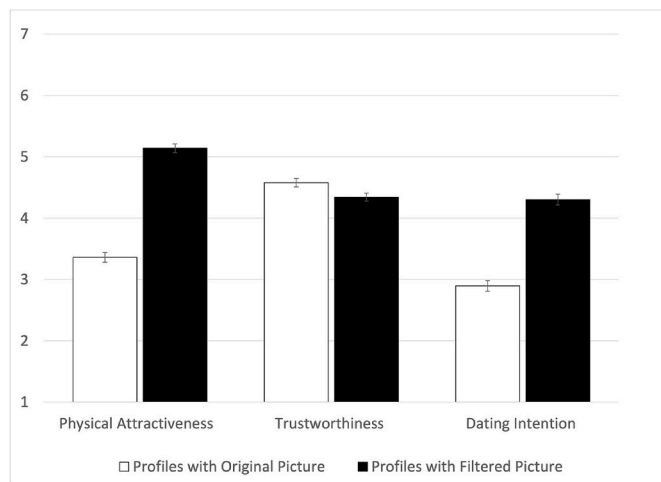


Fig. 2. Attractiveness, trustworthiness and dating intention depending on the use of filters (means and corresponding standard errors). Note. $N = 241$. All three variables were measured on a seven-point Likert scale ranging from 1 (absolutely not) to 7 (absolutely).

² Note that we used the overall means of the dependent variables instead of the differences of means between conditions to examine Hypotheses 3–5, which diverts from the analyses plan outlined in the pre-registration. This was due to our consideration that analysing associations between the overall means of our dependent variables better fits our hypotheses. However, when we used the differences between conditions, we obtained significant correlations between our dependent variables ($p < .001$; see Supplement S8, associations between dependent measures and indirect effects) which were similar to the results using the overall means.

1.04) and profiles with an original picture ($M = 4.58, SD = 1.05$), $t(240) = -3.65, p < .001$, Hedges' $g_{av} = 0.23$. The latter result indicates that profiles with a filtered picture were perceived as less trustworthy than profiles with an unedited picture. Regarding the overall effect of filter use on dating intention, dating intention was significantly higher for profiles with a filtered picture ($M = 4.30, SD = 1.40$) than for profiles with an original picture ($M = 2.90, SD = 1.34$), $t(240) = 13.94, p < .001$, Hedges' $g_{av} = 1.03$. Note that we observed rather large positive effects of using beauty filters on attractiveness as well as dating intention. Using beauty filters decreased perceived trustworthiness, but this effect was considerably smaller.

3.2. Associations between the dependent measures and indirect effects

As expected in Hypotheses 3 and 4, perceived physical attractiveness was positively associated with both perceived trustworthiness, $r(239) = 0.56, p < .001$, and dating intention, $r(239) = 0.76, p < .001$. Moreover, perceived trustworthiness was associated with higher dating intention scores, $r(239) = 0.52, p < .001$ (Hypothesis 5).

Connecting the paths of our theoretical model, we tested for mediation in a subsequent step. For this purpose, we used version 2.1 of the MEMORE macro for SPSS by Montoya and Hayes (2017), model 1 with default settings (Bootstrapping = 5000). This macro is a variant of the PROCESS macro that can be applied to data that are based on two-group within-subject designs. Our experimental condition served as the independent variable, perceived physical attractiveness and perceived trustworthiness were entered as parallel mediators, and dating intention was the outcome. The respective results are summarized in Table 1.

The analysis revealed a significant total effect of experimental condition (profile with filtered vs. original picture) on dating intention, $b = 1.41, SE = 0.10, t(240) = 13.94, p < .001, 95\%CI [1.21, 1.61]$, reflecting the main effect result reported above: Women had a higher intention to date a man with a filtered picture than to date a man with an unedited picture. Regarding mediation effects, the indirect effect of the filter condition on dating intention via trustworthiness was significant, $estimate = -0.08, SE = 0.03, 95\%CI [-0.14, -0.03]$. The indirect effect of the filter condition on dating intention via physical attractiveness was significant as well, $estimate = 1.73, SE = 0.11, 95\%CI [1.52, 1.95]$. In addition, we found a significant negative residual (i.e., direct) effect of filters on dating intention, $b = -0.25, SE = 0.11, t(238) = -2.32, p = .021, 95\%CI [-0.46, -0.04]$. Taken together, the effect of filters on dating intention was mediated by perceived trustworthiness and physical attractiveness—in opposite directions. Whereas lower trustworthiness as ascribed to the filtered condition reduced dating intention, perceived physical attractiveness was the key driver responsible for increased dating intention when beauty filters were applied. The mediation analysis further revealed a significant negative residual effect of filters that was not explained by trustworthiness, suggesting that other, non-explored factors led to a less positive evaluation of edited online dating pictures.

Table 1
Mediation analysis results.

Effect	Profiles with filtered (1) vs. with original picture (0)				
	estimate	SE	t	p	95% CI
Total	1.41	.10	13.94	<.001	[1.21, 1.61]
Direct	-0.25	.11	-2.32	.021	[-0.46, -0.04]
X → M1	-0.24	.07	-3.65	<.001	[-0.37, -0.11]
X → M2	1.78	.08	23.10	<.001	[1.63, 1.93]
M1 → Y	0.33	.06	5.77	<.001	[0.22, 0.45]
M2 → Y	0.98	.05	20.05	<.001	[0.88, 1.07]
Indirect M1	-0.08	.03			[-0.14, -0.03]
Indirect M2	1.73	.11			[1.52, 1.95]

Note. $N = 241$. Estimate = unstandardized coefficients. CI = confidence interval. M1 = Trustworthiness, M2 = Attractiveness, Y = Dating intention.

3.3. Further analyses

In our first additional analysis, we examined whether perceived physical attractiveness or perceived trustworthiness were more strongly associated with women's dating intention (Research Question 1). A statistical comparison of correlations was conducted with the help of a two-tailed test for overlapping correlations based on two dependent groups using the *cocor* package (Diedenhofen & Musch, 2015). As recommended by Hittner et al. (2003), Williams' *t*-test (Williams, 1959) was used to compare the two correlations. The result, $t(238) = 6.03, p < .001$, indicates that the correlation between perceived physical attractiveness and dating intention $r(239) = 0.76$ was significantly higher than the correlation between perceived trustworthiness and dating intention, $r(239) = 0.52$.

To answer Research Question 3, differences between conditions (filtered minus original) were calculated and used to conduct Pearson's zero-order correlations. Answering Research Question 3a, participants' photo-editing experience was unrelated to the difference between conditions in terms of perceived physical attractiveness, $r(239) = 0.11, p = .077$. Likewise, participants' photo-editing experience was unrelated to the difference between conditions in terms of trustworthiness, $r(239) = -0.11, p = .104$. Thus, photo-editing experience was unrelated to the differences imposed by responding to profiles with edited (vs. unedited) pictures.

4. Discussion

4.1. Consequences of using beauty filters

In recent years, mobile dating apps have become the go-to means for many people to initiate romantic relationships. With their strong emphasis on visual impressions (in the form of prominently placed profile pictures), the respective platforms create a link between the presentation of attractive images and successfully reaching one's romantic goals (e.g., Toma & Hancock, 2010; van der Zanden et al., 2022). As such, mobile dating users may feel prompted to curate their digital self-presentation to the best of their ability—not least by using beauty filters that are easily accessible and require no software skills.

Against the background of the selective self-presentation perspective (Walther, 1996, 2007) and social information processing theory (Walther, 1992, 2016), we connected theory and research on online and mobile dating (e.g., Toma & D'Angelo, 2017; Wotipka & High, 2016) with theory and research on facial attractiveness (e.g., Dion et al., 1972; Han & Laurent, 2023). We suggested that filters have a Janus-faced effect, leading to higher perceived attractiveness, but—possibly—to lower perceived trustworthiness, two process variables with downstream effects on dating intentions. To test our model, we pre-registered and conducted an online experiment comparing unedited pictures with moderately edited counterparts as part of Tinder profiles. We specifically focused on the perception of male profile pictures by hetero- or bisexual women.

Our data showed that women perceived men with filtered profile photos as more physically attractive, but as less trustworthy than men with unfiltered images. The latter result adds to prior theory and research that highlighted the link between ample opportunities for idealized self-presentations (e.g., Walther, 2007) and perceptions of trustworthiness in mobile dating (e.g., Cali et al., 2013; Herring et al., 2022; Silva et al., 2019; Wotipka & High, 2016). Further, we found that the more attractive and trustworthy our participants deemed the depicted men, the more likely they were to express dating intentions. A mediation analysis showed that both paths were significant. Comparing both indirect effects, we found attractiveness evaluations to be the stronger mediator: Even though applying beauty filters to online dating pictures slightly decreased men's perceived trustworthiness—and in turn decreased women's interest in dating them—the added bonus of higher physical attractiveness resulted in higher dating intentions. These

results did not change when controlling for personal photo-editing experience or including only participants with Tinder experience (see Supplement S7).

Adding to this main finding, however, we also observed a negative residual effect of the filter manipulation on women's dating intention, i. e., a detrimental effect that was not explained by either attractiveness or trustworthiness. In our interpretation, this might indicate certain social norms at play, as beauty-related measures are still much less well-accepted among men than among women. More so, we assume that being aware of a man beautifying his pictures may have led some participants to ascribe other, supposedly undesirable perceptions to the person in question—such as vanity (Han & Laurent, 2023). Attributions of low self-esteem, or a lack of (stereotypical) masculinity could have played a role as well. Of course, future studies focusing on these concepts are needed to corroborate the validity of our interpretation. Nevertheless, we want to reiterate that a positive total effect of beauty filtering on dating intentions was observed, as neither the negative indirect effect via trustworthiness nor the negative residual effect turned out large enough to overwrite the positive impact via increased attractiveness.

In summary, our research underscores that photo filters influence different variables of impression formation in different ways, with increased physical attractiveness emerging as the dominant effect in our study. Except for the missing moderation of photo-editing experience, the results are in line with our model on the effects of using beauty filters in online dating, which is based on social information processing theory as a general theoretical framework. By focusing on a female perspective, we found new evidence that hetero- and bisexual women might indeed feel drawn to 'beautified' men—even if they attribute slightly less trustworthiness to the depicted individuals. Based on these results, our work offers an intriguing counterpoint to the stereotypical notion that only women may benefit from the use of beauty measures in order to improve interpersonal success. At the same time, there is also an ethical discussion to be had about the value of people actively changing their visual appearance to increase the likelihood of positive online (and subsequent offline) contact. Indeed, with contemporary movements such as #bodypositivity strongly advocating for less shallow and restrictive beauty standards in our society (e.g., Cohen et al., 2019), some individuals might view the use of beauty filters through a much more critical lens. Similarly, it may be pointed out that users of digital platforms have become increasingly invested in perceptions of authenticity and 'realness' in recent years (e.g., Enli, 2015; Lee, 2020)—a priority that may grow even stronger in the future, considering the many aspects of modern online communication that facilitate heavily edited or downright fabricated presentations of the self, along with even better editing software that profit from developments in the field of artificial intelligence (e.g., Allyn, 2023). As such, we suggest that our findings are assessed in close connection with on-going developments in the online sphere.

In addition to our contributions to the field of mobile dating, the results inform theory and research on impression formation. The "beautiful-is-good"-effect is one of the most robust and best-known effects in social psychology. Our work is in line with recent scholarship that highlighted a nuanced assessment regarding the psychological effects of facial beauty on observers (e.g., Han & Laurent, 2023; Sofer et al., 2015). A more ideal face (e.g., wrinkle-free and spotless skin, well-defined jawline, specific anthropometric proportions and symmetry) appears to be rewarded with higher attractiveness, but it may evoke less desirable character attributions in terms of lower morality and less trustworthiness at the same time. Although these collateral effects seem to be particularly relevant in a dating context in which trust plays a pivotal role (e.g., Silva et al., 2019; Wotipka & High, 2016) and idealized self-presentations are frequent and well-known (e.g., Degen & Kleeborg-Niepage, 2022; Ellison et al., 2012), using beauty filters appears to pay off at the early stages of mobile dating in which eliciting an intention to date is a prerequisite of dating success (Finkel et al., 2012;

Markowitz et al., 2018).

4.2. Limitations and future research

To our knowledge, this is the first experimental study to examine the impact of beauty filters on potential dating partners. Several limitations should be pointed out, as doing so might offer valuable starting points for future research endeavors. First, since Tinder currently ranks as the most popular online dating app in the US (McClain & Gelles-Warnick, 2023) and worldwide (Apptopia, 2023), we deliberately chose this app as our study setting and only recruited young women from an age range with particularly frequent mobile dating app usage (McClain & Gelles-Warnick, 2023). These choices clearly limit the generalizability of our results—even though we suspect that similar results would emerge when focusing on comparable image-based dating apps or websites. Yet, we encourage researchers to test our assumptions with different settings (e.g., more text-based dating platforms) and target groups (e.g., older generations of women). Another limitation is that we restricted our investigation to women's perceptions of male dating profiles. We deliberately opted for this design to reduce the likelihood of validity concerns, given the problem that potential differences between genders may be due to gender differences or stimulus set differences – two sources of variance that are difficult, if not impossible to disentangle. Even though our perspective on gender differences was guided by methodological caution, future research is encouraged to examine men's perceptions of women using beauty filters. Research with a specific focus on participants from non-Western cultures, different ethnic backgrounds, or sexual orientations are further encouraged.

Limitations of our study's generalizability not only stem from the nature of the recruited sample, but also from the homogeneity of the men portrayed in our stimuli. To allow for a consistent application of the chosen beauty filter—and anticipating racial homophily effects among the pre-dominantly White participant pool—we exclusively used pictures of Caucasian men in the presented screenshots. In light of this restriction, we urge our peers to involve men from other ethnic groups in future studies.

Furthermore, we note that even though we strived to mimic a realistic Tinder setting, the amount of information shown on the profiles was kept to a minimum (i.e., a single picture, the person's name, and age) to increase experimental control. While empirical data indeed confirms that the decision to swipe left (dismiss) or right (match) on Tinder is typically determined by the very first picture (Ward, 2016), additional photos or text-based cues might also influence women's impressions in a substantial manner. Therefore, future studies should employ controlled designs that feature a larger set of profile pictures (e.g., profiles with all filtered or unfiltered pictures compared to mixed profiles), as well as different textual and biographical information.

Lastly, we want to highlight that our study could only involve a limited number of concepts and measures. The study did not include a direct measure as to what extent participants detected filter use in the edited condition. As administering questions about filter use itself could stipulate related thoughts, a careful methodological approach seems warranted, such as a thought listing task (see Appel and Prietzel, 2022, in the context of deepfake detection). Moreover, as indicated by our negative residual effect, there are likely other important factors underpinning female users' impression formation on online dating sites. This may include evaluations regarding the person's self-esteem, narcissism or vanity or the perceived compatibility or match. Including these aspects in future studies could help to understand the intricate processes at play. Additionally, other outcome measures than a single (albeit externally valid) "swipe right" item are recommended to expand our understanding of women's intention to date a depicted user. If scholars find a feasible and ethically responsible way to do so, it would also be interesting to investigate how beautified pictures affect subsequent first encounters between daters in the offline world.

4.3. Conclusion

Extending present theory and research, we reported a twofold effect of idealized self-presentation in terms of using beauty filters in male online dating profiles: By editing their pictures, hetero- or bisexual men on online dating apps might substantially increase their attractiveness as ascribed by potential female partners, but evaluations of trustworthiness are likely to decrease. According to our research, however, these opposing effects may eventually culminate in higher female dating intentions for men with edited pictures.

Credit author statement

Markus Appel: Conceptualization, Methodology, Software, Validation, Formal Analysis, Data Curation, Writing- Original draft, Writing - Review & Editing, Visualization, Supervision, Project administration, Fabian Huttmacher: Writing- Original draft, Writing - Review & Editing, Theresa Politt: Conceptualization, Formal Analysis, Methodology, Software, Validation, Investigation, Data Curation, Writing- Original draft, Visualization, Jan-Philipp Stein: Writing- Original draft, Writing - Review & Editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The supplement, data, and code are provided at <https://osf.io/qtnu3/>

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