'What lies behind the filter?': Uncovering the motivations for using augmented reality (AR) face filters on social media and their effect on well-being

Abstract: Augmented reality (AR) filters are a popular Instagram feature affording users a variety of visual effects. Despite their wide-spread use, no research to date has examined either 'why' people use them (i.e. motivations) or 'how' their usage makes people feel (i.e. well-being effects). Through the uses and gratifications theory supported by a sequential mixed-method approach (interviews N = 10 and survey N = 536), we provide three overarching contributions. First, based on prior literature and a qualitative study, we identify nine motivations that can potentially drive AR face filter usage on Instagram. Our survey evidences that seven of those motivations (e.g. creative content curation, social interactions) are significant drivers of usage behaviours, while two (true self-presentation and silliness) did not have such significant impact. Second, we provide nuanced insights into the multi-faceted nature of the self-presentation motives underpinning AR face filter use (ideal self, true self, transformed self). Lastly, we show filter usage can have both positive and negative well-being effects dependent on the underlying motivation. The results offer important implications for policymakers, site designers and social media managers.

Keywords: Augmented reality; Face filter; Social media; Uses and gratification; Well-being; Self-presentation

1. Introduction

The lifeblood of social media platforms such as Instagram is the creation and sharing of visual content (photos and videos) (Choi & Sung, 2018; Kostyk & Huhmann, 2021), with site designers investing greatly in features (e.g. filters, airbrushing, photo-editing options) that aid users in creating visually appealing and engaging content (Vendemia & DeAndrea, 2018). The newest and most disruptive technology in this arsenal is augmented reality (AR) filters, which are commonly applied on users' faces – for example, adding "cool" apparel, beautifying their facial features, making them appear as a fictional creature or overlaying 'silly' items. Bhatt (2020) reports that 600 million people use AR filters each month on Instagram or Facebook and 76% of Snapchat users use them everyday.

Such popularity of AR face filters is a testimonial that this format of AR taps into specific needs that users are motivated to satisfy. Yet, no study to date has uncovered what specific gratifications AR face filters fulfil. Prior research identified the gratifications that users seek to satisfy when engaging with social media (Erz, Marder, & Osadchaya, 2018) or, in the domain of AR, when playing games like Pokémon Go (Hamari et al., 2019; Jang & Liu, 2020) or wearing smart glasses (Rauschnabel, 2018). However, AR face filters differ rather substantially from these types of AR, as AR filters are activated on social media and closely associated with self-enhancement and self-presentation, thus potentially pointing towards a unique set of gratifications that have not been previously explored in other forms of AR. We aim to fill this gap by addressing our first research question. RQ1: *What gratifications do users seek to fulfil when overlaying AR face filters on social media?*

Crucially though, virtually modifying one's appearance can impact how users feel about themselves and consequently their mental well-being (Lee & Lee, 2021; Javornik et al., 2021). A related phenomenon is "Selfie dysmorphia", where consumers

experience negative self-esteem issues and perceived body distortion when visually enhancing selfies (Rajanala, Maymone, & Vashi, 2018). This can be exacerbated by AR filters, as virtual modification occurs in real-time and is more realistic, in some extreme cases potentially pushing people to seek surgery (Hunt, 2019). On the other hand, social media can also positively affect mental well-being, for instance when presenting aspects of oneself that are otherwise hidden or exploring one's identity (Choi & Sung, 2018; Javornik et al., 2021). AR face filters could thus potentially affect mental well-being in a variety of ways. Yet, the empirical evidence is lacking, as noted in the vivid discussions on this subject (UK Government – House of Commons, 2019, 2020), and by the growing calls to unveil the impact of digital technologies on well-being (Marder et al., 2016; Lavertu et al. 2020). Our second research question (RQ2) thus asks: *How do the gratifications associated with uses of AR face filters affect well-being?*

Through our mixed-methods approach that combines in-depth interviews and a survey study, we provide three theoretical contributions related to AR face filters in human behavior. First, we uncover seven types of gratifications that drive use of AR face filters, some unique to this particular feature (e.g. creative content curation, affiliation, convenience) while others are similar to those outlined in related studies (e.g. enjoyment, social interaction, ideal self-presentation) (Erz, Marder & Osadchaya, 2018; Jang & Liu, 2020). Second, we extend prior uses and gratification studies that have assessed self-presentation motivation as a single-dimension related to self-enhancement. We demonstrate self-presentation motives as multi-faceted, as they are associated not only with the drive to present the ideal selves but also the true one as well engaging in transforming one's self-presentation. Uncovering these nuances in the self-presentational drive for AR filter use contributes to the nascent stream of research on self-concept and immersive technologies in marketing and human-computer interaction fields (Javornik et al. 2021; Mueller et al. 2020). Thirdly, we contribute to

the prior literature on social media and well-being (e.g. Zheng et al., 2020; Keles et al., 2019; Rui and Stefanone, 2013), showing that AR face filters can be a double-edged sword for well-being. They can have a detrimental impact, if use is motivated by showing oneself in an idealized light, adding empirical weight to the notion that AR filters exacerbate selfie dysmorphia, while in other instances positive effects can arise. These findings call for a more considered and ethical approach to the deployment of this technology.

2. Background

2.1 Motives for technology and media use

The uses and gratifications (U&G) approach examines what needs people are seeking to fulfil and how that motivates them to use a certain technology or media (Phua, Jin, & & Kim, 2017; McLean & Osei-Frimpong, 2019). McQuail (1984) identified five general gratifications - seeking information, entertainment, social interaction, personal identity, and convenience – which vary across technologies or media.

U&G has been widely applied in the context of social media use to understand individual motivations and the corresponding gratification fulfilment (Erz, Marder, & Osadchaya, 2018; Flecha-Ortíz et al., 2021). A study of Snapchat showed that a "selfie" is the type of content that users are most likely to post as they seek to bond with close contacts via such content (Piwek & Joinson, 2016). Similarly, Sung et al. (2016) found that communicating with friends and family was an important motivational driver for posting selfies on social networks, as well as archiving and attention-seeking. Alongside the motivations that underpin general use of social media, prior research also focused on specific features of such platforms – for instance, Instagram users reported employing hashtags due to their need for self-presentation, chronicling, information seeking, and also as part of online etiquette (Erz, Marder, & Osadchaya, 2018), and

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among these, self-presentation had the strongest association with hashtags' use frequency. Sheldon et al. (2017) showed that students use Instagram for social interaction, escapism, documenting, and creativity. In their qualitative examination of adolescents' motives for using Instagram, Throuvala et al. (2019) found that this demographic group relies on this platform for escapism: for instance, to counteract boredom, and also to be entertained or to learn new things. This is complemented by the convenience and social pressure of "being always on" that these platforms afford. Crucially, Throuvala et al. (2019) acknowledge the duality of a self-presentation driver, which encompasses both the idealization and beautification as well as the more realistic and inclusive representation, which is traditionally absent from mainstream media.

In recent years, U&G framework has also been examined in relation to certain forms of AR. Rauschnabel (2018) identified self-expression, socializing and enjoyment as the key motivational drivers for AR smart glasses use, but Rauschnabel, He, & Ro (2018) also highlighted that privacy risks can hinder this process. Furthermore, Ghazali, Mutum and Woon (2019) evidenced that for the players of the famous AR mobile game Pokémon Go, the need for achievement, challenge and social interaction indirectly drive continuous use through the mediating role of enjoyment. Several other studies examined motivational factors and adoption of Pokémon Go. Rauschnabel, Rossmann and tom Dieck (2017) demonstrate that intentions for continuous game use are driven by emotional, social and hedonic factors. In other studies, entertainment and content enjoyment were also identified as the key use predictors of this app, as well as the game knowledge, nostalgia and trendiness (Jang & Liu, 2020; Hamari et al., 2019). This stream of research on AR games is complemented by a qualitative examination (Alha et al., 2019) unveiling also some other factors for continued game use, such as prior positive experience, intrinsic interest and expectations.

While prior research has provided a thorough understanding of why individuals use social media and certain types of AR (AR mobile games, AR smart glasses), there is a paucity of research concerning the motivations that drive users to apply increasingly popular AR filters/effects. Prior research has shown that motivational factors for AR games as opposed AR smart glasses differ (Rauschnabel, 2018; Ghazali, Mutum and Woon, 2019), thus indicating that different types and uses of AR differ in that regard. AR face filters stand out in terms of content and the way they are used from these other forms of AR, which makes it possible that different motivations would drive them. What makes so many people use the diverse AR "filters" (Olafson, 2020), ranging from a puppy face filter, to Hello 2020 filter glasses that were superimposed over a face with falling balloons in the background? Is it just because they are purely amusing and entertaining (Spark AR, 2021: Matney, 2020), or are there other reasons?

2.2. Social media and AR effects

AR has been applied across a range of contexts, such as marketing, where it is extensively used for advertising (de Ruyter et al., 2020), to deliver experiential value (Scholz & Duffy, 2018), and to permit virtual product try-on such as make-up (Javornik et al., 2016). While virtual try-ons were initially used for commercial purposes in the context of a purchase customer journey, they are rapidly becoming part of visually focused platforms, like Snapchat and Instagram (WeAreSocial, 2020), for hedonic and experiential purposes (see Fig. 1 for examples). People post photos of themselves with flower crowns, doggy ears, or their faces on a slice of toast. Filters are a particularly popular feature of Instastories, with around 500 million Instastories published each day (Statista, 2021), documenting users' activities and shared with their audience for 24 hours (Statista, 2021).

The introduction of such AR effects has enabled individuals to overlay the physical environment with virtual information such that the user can interact with these virtual elements in real-time as if they were actually situated in the physical space (Hilken et al., 2017). Spark AR Studio, which is a Facebook-owned platform for creating AR effects, became open to everyone to build their own filters, which further contributed to their proliferation (Hutchinson, 2019). An Instagram example is the account @face.effects, which has 258k followers and regularly features new filters that visualize creative, fantasy-like, politically engaged, beautifying, silly, animal-like, and other effects.

*Fig. 1: Examples of a beautifying filter with artistic content (left) and
a fantasy-like filter (right)*

Similarly, AR effects are widely employed on other social media applications for videos and photos (Williamson, 2020). Importantly, such AR effects differ from filtered

photos where editing is applied retroactively. Instead, AR enhancement occurs in real-time and is thus more dynamic and interactive.

2.3 Potential motivations for AR face filter use

Prior research in the area of social media, Instagram, and AR (Erz, Marder & Osadchaya, 2018; Rauschnabel, 2018; Sheldon et al., 2017; Throuvala et al., 2019) would suggest that the possible motives for the use of AR filters are likely to relate to self-presentation (how a person presents herself to the social network); enjoyment; social interaction; convenience. Before empirically examining these motivations in relation to the AR face filters, we hypothesise the potential links with use behaviour. Specifically, we examine how frequently individuals use the filters as well as how much they explore filters' variety. These two components combined can offer more holistic insights into filters' use.

Self-presentation – Users are likely to rely on content with AR filters to present themselves in a specific manner to an online audience. Crucially, there are different types of selves one could try to convey. A possible type of self-presentation can relate to expressing the true self (Hollenbeck & Kaikati, 2013) – despite the virtual modification, representation through filters can be congruent with the user's true self. Conveying one's authentic nature is an important part of people's online representation (Back et al. 2010; Tosun, 2012). Offline, face-to-face interactions can inhibit the expression of the true self, while online platforms can potentially offer more freedom to users to express it (McKenna et al., 2002). AR filters offer new tools for visualising such true aspects of oneself. Our first hypothesis postulates the link between this motivation and filters' use and exploration.

H1: True self-presentation through AR face filters a) drives filters' use frequency and b) drives filters' exploration.

Secondly, filters can depict an idealised version of self, for instance, catering to the aspirations to be more beautiful or associated with cool signifiers (Hollenbeck & Kaikati, 2013; Hong et al., 2020). An idealised presentation of the self is a crucial part of social media activities, as users are much more likely to depict only the positive moments or their best looks to create an elevated impression of themselves (Chua & Chang, 2016; Zheng et al, 2020). AR filters offer tools to convey oneself in real-time with improved appearance according to the beauty standards such as smoothening the skin or to visualise any other characteristics that are part of the ideal self. This gratifies the need for positive self-presentation. We hypothesise that it drives both the use frequency as well as the exploration of filters to find those that would best fulfil this motivation.

H2: Ideal self-presentation through AR face filters a) drives filters' use frequency and b) drives filters' exploration.

Thirdly, users can rely on filters to find new aspects of themselves. Such use is not tied into a true or ideal version of the self, but is focused on the online transformation of one's self-concept (Yee & Bailenson, 2007). Yim et al. (2018) for instance demonstrate how consumers mentally project themselves into an imagined scene or consumption context which can transform their view of the self in the process. Millennials for instance have been shown to appreciate opportunities for such transformation and expansion of their self-concept when interacting with luxury brands (de Kerviller & Rodriguez, 2019). Similarly, individuals who are seeking novelty in the self-domain can rely on the interactive visual imagery of AR filters to present such new versions of selves. We hypothesise a link between such transformation and filters' use frequency as well as exploration.

H3: Transformed self-presentation through AR face filters a) drives filters' use frequency and b) drives filters' exploration.

Enjoyment – There is extensive prior evidence that AR technologies and virtual 'try-ons' are strongly associated with a hedonic value (Javornik et al., 2016; Hilken et al., 2017). Enjoyment and fun represent an important driver for using AR smart glasses or playing AR games (Rauschnabel, 2018; Jang & Liu, 2020) and for generally engaging with social media (Throuvala et al., 2019). As with these other AR formats, enjoyment is expected to be an important driver for use frequency and exploration of AR face filters. The entertaining value can be associated with escapism, as users rely on digital and online platforms to transport themselves into the imaginary world (Yim et al., 2018), and AR filters facilitate this escapism by situating the virtual elements right in the user's surroundings. We hypothesise that use frequency is driven by this behaviour, as well as the exploration of the filters because the users are looking for those filters that would best gratify their need for enjoyment.

H4: Enjoyment of AR face filters a) drives filters' use frequency and b) drives filters' exploration.

Social interaction – Prior research shows that people post selfies to bond and to communicate with others and keep in touch (Sung et al., 2016; de Vries et al., 2017). Social media content such as Instastories are highly interactive in the sense that they have built-in features for followers to comment or react via default emojis. Moreover, posting filtered images of oneself (or one's life) is a specific way of entering into social interactions; selfies for instance focus the audience specifically on the self-related content (Hong et al 2020). We suggest that using AR filters overlaid on oneself can have a different effect on the intended audience than a posted selfie alone. Immersive

virtual modifications can trigger the recipient's reactions to take a variety of forms - approval, excitement, shock – and to elicit higher engagement from one's social network. While selfies can be posted for gaining social approval or popularity (Chatzopoulou et al., 2020), the motives for AR filtered content can range beyond that and be used as a means for initiating interactions, establishing communication with followers, and drawing attention to specific topics. For example, Instastory filters such as the Butterfly Pretty filter were popular in the Covid-19 pandemic as users sought novel ways in which to present themselves and their individuality while at home in isolation in order to connect with others (Pitcher, 2020). We propose that the need for social interactions is an important driver of filters' frequency use and exploration.

H5: Social interactions through AR face filters a) drive filters' use frequency and b) drive filters' exploration.

Convenience – Previous research continues to demonstrate the importance of utilitarian value – e.g. use of food delivery apps (Ray et al., 2019) and consumer brand engagement through voice assistants (McLean et al. 2021). Posting content overlaid with AR does not directly provide a vehicle for convenience in the form of information-seeking as is the case for the typical use of social media (de Vries et al. 2017). Instead, the potential convenient value could be related to the AR characteristics that allow the creation of relevant and meaningful content in a quick, efficient way, as AR creates visualizations in an effortless manner. This specific convenience provided by AR filters is expected to drive both use frequency and exploration.

H6: Convenience of AR face filters a) drives filters' use frequency and b) drives filters' exploration.

2.4 Psychological well-being

Social media is increasingly investigated in relation to aspects of subjective well-being, as the link between the two is becoming evident (Berezan et al., 2018; Pera, Quinton, & Baima, 2020). In academic literature, well-being is linked to the quality of psychological experiences (Deci and Ryan, 2006), and can relate to life satisfaction, happiness, perceived quality of life, anxiety, depression, and self-image (Weinstein, 2018). It denotes users' evaluation of how happy they feel in their life, both in the moment or also long-term. This has been specified with two separate dimensions of affect – negative affect and positive affect (Diener & Emmons, 1984). Both are relevant to this research as we aim to uncover how much the different motivations for using AR face filters can influence one's well-being in terms of a person's affect. Prior work on social media has focused disproportionately on the negative effects of social media on well-being, but there is ample evidence for positive effects, too (Beyens et al. 2020). This valence can depend on how much the positive side of social media use (e.g. inspiration, social connectedness) outweigh the negatives (e.g. envy) (Weinstein, 2018).

Furthermore, Ryff (1989) defined subjective well-being more specifically in terms of different aspects of one's life, concretely self-acceptance, relations with others, autonomy, environmental mastery, purpose in life and personal growth. Among these, our research focuses specifically on self-acceptance as a key dimension of well-being that is related to self-concept. Given that AR face filters virtually modify one's appearance and that AR try-on can impact the self-concept (Javornik et al., 2021), our work questions more specifically how those motivations that are associated with the self-concept and AR face filter use on social media can impact the self-acceptance dimension of well-being.

Online spaces offer new possibilities to individuals to express who they are and to do so in ways that are not always possible in real life (McKenna et al. 2002). Such true representation on social media and accompanying lower discrepancy between one's outward presentation and unguarded self can indirectly increase subjective well-being (Kim & Lee, 2011; Sheldon, Gunz, & Schachtman, 2012; Reinecke, & Trepte, 2014). Being truthful about oneself online is also associated with user's acceptance of one's characteristics (Aricak, Dündar, & Saldana, 2015; Pera, Quinton, & Baima, 2020). While AR face filters virtually modify users' faces, they also offer novel types of visualisation to present one's authenticity, which is expected to increase positive affect, as well as reduce negative affect. We postulate that those individuals who are conveying their true self through AR filters will experience higher self-acceptance as the filters will visualise their authenticity.

H1: True self-presentation through AR face filters c) increases self-acceptance, d) increases user's positive affect, and e) decreases user's negative affect.

However, certain types of appearance-focused activities on social media can have a harmful impact on vulnerable individuals's well-being, for instance adolescents or individuals with low self-esteem (Chae, 2017; Choukas-Bradley et al., 2020; Bue, 2020; Steinsbekk et al. 2021). The driver of such negative effects on mental well-being can be the comparison that users draw between themselves and the idealized representation of others (Lee & Lee, 2021), as well as the concerns how others might perceive one's representation online (Marder et al., 2016). For instance, those young girls that are highly involved with posting their most attractive selfies, experience increased body dissatisfaction, internalization of beauty ideals, and are more likely to suffer from eating disorders (McLean et al., 2015). AR face filters can portray one's idealised appearance with higher realism, either by enhancing one's facial feature or

overlaying "beautification" filters (for instance infantilising one's face or making it baby-like). Such changes, albeit ephemeral, can represent a disruption to one's self concept, making the gap between actual and ideal self more apparent, which has been shown to lead to lower tolerance for one's flaws (Javornik et al., 2021). Thus, we expect that those who are motivated by presenting themselves in an enhanced light through AR filters, will experience a lower acceptance of themselves and a decreased well-being in terms of one's positive and negative affect.

H2: Ideal self-presentation through AR face filters c) decreases self-acceptance, d) decreases user's positive affect, and e) increases user's negative affect.

Another important aspect of self-presentation online is a potential transformation that one experiences through online portrayal. Chatzopoulou et al. (2020) showed that men with low body self-esteem engage in fitness activities to transform their bodies into "instabods" to receive online community recognition. Such body transformation results in anxiety and muscle dysmorphia, but also in positive effects like higher self-confidence (Chatzopoulou et al., 2020). Online-only transformation that can be achieved via avatars (Yee & Bailenson, 2007) or AR face-filters is less intrusive than physical body transformation. It offers an effortless way to expand oneself into new directions without the pressure of physically achieving such change. This visual extension of the self in ways that are meaningful to the individual can act as a proof for the desired self-transformation, thus increasing self-acceptance and having a positive impact on one's affective state.

H3: Transformed self-presentation through AR face filters c) increases self-acceptance, d) increases user's positive affect and e) decreases user's negative affect.

Besides self-related motivations, users are also driven to AR face filters to experience enjoyment. Numerous studies revealed the link between hedonic activities and one's well-being (e.g. Huta & Ryan, 2010; Batat et al., 2019), also in the online context (Dennis et al., 2017) yet none in relation to AR. Huta & Ryan (2010) demonstrate that the activities associated with hedonia are positively associated with the affective state. Prior studies in AR highlighted the hedonic aspect of this technology experience (Hilken et al. 2017). We propose that this enjoyment that is derived from the pleasure of interacting with visually stimulating AR filters can have a positive impact on a user's affective state.

H4: Enjoyment of AR face filters c) increases user's positive affect and d) decreases user's negative affect.

The effect of social media use on well-being depends on the type of social activity (Burnell, George, & Underwood, 2020). Increased social connectedness that online space can deliver has shown to improve users' well-being (Sinclar, & Grieve, 2017; Hoffman, Novak, & Kang, 2017), while peer pressure and cyberbullying can cause anxiety and depression among adolescents (Best, Manktelow, & Taylor, 2014). Social interactions afforded through AR face filters are likely to have a high hedonic connotation, due to the AR overlays commanding a playful, enjoyable experience (Javornik et al., 2016). The nature of AR face filters would thus enrich social interactions with more fun and enjoyment, leading to a more positive affective state and a decreased negative state.

H5: Social interactions through AR face filters c) increase positive affect and d) decrease negative affect.

3. Methodology

The study adopts a mixed-methods approach and combines a qualitative study with a survey. The aim of the qualitative study was to conduct interviews with Instagram and Snapchat users to explore and gain qualitative insights about their underlying motivations related to the use of face filters, also to uncover the motivations that have not been previously identified (Lincoln & Guba, 1985; Strauss & Corbin, 1990). We follow the approach of Erz, Marder, and Osadchaya (2018) in that the established categories of motives (entertainment, social interaction, personal identity, and convenience) guided the investigation about the individuals' motivations to use filters. The aim was to understand how both the established and potentially novel motivations are specifically linked to the uses of AR filters on Instagram, with a close interest in the motivations related to self-presentation. The quantitative study, i.e. survey, was conducted in order to explore and validate the identified motivations and examine their effects. Institutional ethics approval was obtained prior to data collection.

3.1 Qualitative study

We recruited participants for our interviews via social media and through invites sent to students at three UK universities. The participant criteria were to be between 19 – 35 years old, UK resident and a regular user of filters on social media where filters are a prominent feature (i.e. Instagram and Snapchat). Our sample of 10 full-time students (nine female, aged 20-29) included seven regular Instagram filter users (the others only used Snapchat filters). We gathered data on both Instagram and Snapchat filter use in order to increase the breadth of understanding of possible U&Gs of the phenomenon. Participants received a £10 voucher for an international online retailer as a compensation for taking part. The interviews lasted between 21 and 44 minutes, with an average length of 34 minutes. The lead researcher conducted all the interviews remotely (via Zoom video calls). Only audio was recorded and was transcribed. To

identify specific motivations of AR filters and also to probe for any effects of such motivations on well-being, our interviews were structured as follows. In the beginning, the interviewees were asked to show a recent example of the AR face filter use, both to verify that they do use this feature and also to facilitate their thinking about it. All showed at least one such example and most of them showed several. We started with a set of general questions related to the main filter platform used (e.g. their use of Instagram). Then the interview focused specifically on AR filters, asking the participants about the different filters they tried, how their use of AR filters has evolved, what are their typical uses of filters etc. Subsequently, four set of questions about the different motivations that drive their use of AR filters were asked. Here, we asked both: i) broad questions to allow for novel motivations to emerge ("Why do you use AR face filters? What do these filters contribute to your interactions on Instagram / Snapachat?"); and ii) more specific questions related to self-presentation ("What do the AR filter symbolize in terms of your personal identity? Do they change the way you present yourself online?"), and established motivations from the uses and gratification theoretical approach (information, entertainment, social interaction, personal identity and convenience (McQuail, 1984)). Finally, we iv) explored the link between the filters and well-being (e.g. "Does the use of filters have a positive or negative influence on your everyday life? How?"), again with some emphasis on the differences between the self as presented on the platforms when filtered and the self in real life. In the end, the participants were debriefed and thanked.

Qualitative analysis and hypotheses development

The analysis focused both on validating the motivations that have been previously established in the U&G research as discussed in the background section (true, ideal and transformed, self-presentation, enjoyment, convenience and social interaction), as well

as uncovering new motivations that are unique to AR face filters. We relied on thematic analysis (Braun & Clarke, 2006) to generate measurement items and identify the key motivations that underpin the use of AR filters.

We analysed the data by extracting all items that could link to different uses & gratifications. To ensure a comprehensive analysis, we paid attention both to those that appeared most frequently as well as those mentioned only seldomly. Once the list of items was compiled, it was mapped against the six motivations identified in the background section.

Many generated items validated previously hypothesised motivations. For instance, interviewees discussed in detail how they wish to present themselves in a specific way through filters (e.g. to make them feel good about their appearance; to express parts of their identity that others do not necessarily know about; to explore different looks). Also, hedonic and social aspects were frequently mentioned, as many interviewees rely on the face filters for short-term enjoyment and fun with friends, emphasising the social component.

The items that could not be categorised as part of the already identified motivations were discussed further. With the aim of identifying new potential motivations, four researchers engaged in iterative discussions typical for content analysis (Braun & Clarke, 2006) to identify the patterns across the uncategorised items. Three new motivations emerged as a result of this process: affiliation, silliness, content curation. Below, we offer more insights and also propose hypotheses accordingly in terms of user behaviour and well-being.

Firstly, interviewees explained they used filters to emphasise social or political causes they feel strongly about or to affiliate their image with external entities such as countries, celebrities or cultural celebrations. Affiliation satisfies the need for belongingness which is an important psychological motive (Baumeister & Leary,

1995), also in online contexts (Chen, 2012). AR filters offer new opportunities to users to affiliate themselves with entities that are meaningful to them, thus driving the use frequency and exploration of filters. Moreover, such affiliation via AR offers an opportunity for visualising causes that are significant for self-concept, which in turn affords individuals an opportunity for increased self-acceptance and also a positive impact on one's affect.

H7: Affiliation with other entities through AR face filters a) drives filters' use frequency, b) drives filters' exploration, c) increases self-acceptance, d) increases user's positive affect, and e) decreases user's negative affect.

Another identified motivation was silliness, as the interviewees revealed that AR face filters provided them with an opportunity to act in a funny, frivolous way, to show the carefree side of themselves and an opportunity to be less serious. This motivation is aligned with Farace et al. (2017) who show that silliness is a common component of selfies. AR filters provide means to gratify the motivation to be less serious. We postulate that this drives use frequency behaviour as well as exploratory use. Also, research has shown that silliness is significantly associated with one's mood (Caruso & Shafir, 2006) as the carefree activity can improve one's mood (Locke, 1996) and we postulate for these effects to occur also with AR face filters.

H8: Silliness of AR face filters a) drives filters' use frequency, b) drives filters' exploration, c) increases user's positive affect, and d) decreases user's negative affect.

Finally, the interviewees noted the filters offer tools to make their content more special and to curate it. AR face filters in some cases offer affordances for unique visualisations, thus tapping into the desires of users to experiment with such

possibilities and inspiring them to engage with the social media content in imaginative ways through filters. These findings from the interviews also resonated with some prior research that identified how creative projects and showing off creative skills can be an important motivation for social media use (Mull & Lee, 2014; Sheldon et al., 2017). Other research also pointed out how AR can inspire users (Rauschnabel, Felix, & Hinsch, 2020). Creative content curation is thus expected to drive both the use frequency as well as the filters' exploration. Individuals who engage in creative pursuits often perceive them as highly enjoyable, alongside other positive psychological benefits (Csikszentmihalyi, 1997). We postulate the link between this motivation and improved affect.

H9: Creative content curation through AR face filters a) drives filters' use frequency, b) drives filters' exploration, c) increases user's positive affect, and d) decreases user's negative affect.

Measurement items generation

From the interview data measurement items were coded and compiled by the lead researcher and then validated and discussed with three other researchers on the team, adopting the insider-outsider coding method (Gioia et al., 2010), similar to the approach adopted by Mull and Lee (2014) and Muninger et al. (2019). The initial list of measurement items was 71. Researchers engaged in iterative discussions about the items (Braun & Clarke, 2006) and further reduced them to 55. This reduction occurred as the researchers agreed that certain items could be meaningfully combined because they were expressing very similar ideas. We also revised items by consulting literature on prior measures of similar motivations. Specifically, we relied on the scales for self-presentation, self-expansion, self-brand connection, convenience, enjoyment, silliness,

creativity and social engagement – see Appendix A for more details. However, we paid attention to ensure that the measurement items remained unique to the use of AR filters and captured the associated specificities. The final list included 55 measurement items as generated from the interviews and prior literature.

3.2 Quantitative study - survey

Procedure

We conducted a survey by recruiting 552 Instagram users (who had used filters within the last month) via Prolific.co crowdsourcing platform. Payments were given through the platform. We provided them with the description of AR face filters (see Appendix B). Following the description, we included a verification check of participant eligibility: they had to confirm that they used such a filter in the last month – those that responded 'No', were unable to continue the survey. We also included a description to clarify that using the filters entails all active interactions with the filters, such as trying them on oneself, other people or posting the content for which filters were used (see Appendix B). A quality assurance check included in the study was a question regarding participants' most recent use of AR filters in an open-ended response format. Specifically, each participant was then asked to briefly summarise how they last used an AR face filter on Instagram (how did the filter look; what they were doing when you used the filter; did they share any content with filters like a photo or a video with their friends). Responses were assessed to confirm prior AR filter use and suitability for inclusion in the study. Participants reported on a wide range of filters – silly, beautifying, with artistic effects, animal-like and others; in addition, they described that they either used the filters only for themselves or shared them with others to gauge social interactions or have fun with friends.

Moreover, we included 2 verification checks among the measurement items ("This is an attention check. Please click 1."). 8 participants failed one or more of these checks and were eliminated. Also, 8 other participants were removed as they completed the survey in under four and a half minutes, as this was deemed to be too short a response time to complete the survey meaningfully.

Measures

In addition to the items measuring uses and gratifications, we measured how well-being is affected during the use of AR filters in terms of positive and negative affect with 4 items for each (Watson, Clark, & Tellegen, 1988). We also measured self-acceptance with 4 items from Ryff's psychological well-being scale (Ryff, 1989). Moreover, the measures for our dependent variables were adapted from measures for behavioural use, specifically: frequency (Erz, Marder, & Osadchaya, 2018) and AR filters exploratory use (Lee, Kim, & Fiore, 2010). The items with measurement scales are presented in Table 1.

Sample

The final sample consisted of 536 participants who were above 18 years old, UK residents and have used an AR face filter on Instagram in the last month. Their demographics can be viewed in Appendix C. We also collected descriptive data about their use of the Instagram platform and AR filters. They reported rather high intensity of Instagram use (example item 'Using Instagram is part of my regular social media activity; 7-point Likert; Ellison, Steinfield, & Lampe, 2007): M = 5.75 (SD = 1.29). We also measured frequency of AR filters use (Du, van Koningsbruggen, & Kerkhof, 2018): 17% of participants reported using them less than once a month, 26.9% use them once a month, 27.6% use them once a week, 22.9% several times a week, 4.1% once a day and 1.5% several times a day. The participants had on average 680 followers (SD

= 1562) and followed on average 544 followees (SD = 658). We also asked them how often they use different types of AR face filters (1 – never, 7 – always): funny M = 4.71 (SD = 1.29); cause-related (political or social) M = 2.51 (SD = 1.32); scary M = 2.79 (SD = 1.41); beautifying M = 4.32 (SD = 1.68); location-based M = 2.88 (SD = 1.51); occasion-related (Halloween, Christmas…) M = 3.91 (SD = 1.30) and branded M = 2.51 (SD = 1.31). Filters that are funny, beautifying, or occasion-related were the most popular. We also examined differences across gender by conducting ANOVA and found significantly different frequencies between male and female for scary filters (M_{Male} = 3.24 (SD = 1.42), M_{Female} = 2.63 (SD = 1.36); $F(1, 530)$ = 18.89, $p < .001$) and the beautifying ones (M_{Male} = 3.18 (SD = 1.69), M_{Female} = 4.70 (SD = 1.51); $F(1, 530)$ = 93.77, $p < .001$), with no significant differences for other filters.

Items exploration

Initial exploratory factor analysis included 55 items that were generated both from the interviews and the literature. Bartlett's test of sphericity was significant (< 0.001) and Kaiser-Meyer-Olkin (KMO) sampling adequacy score was .96, thus above the required threshold > 0.60 (Williams, Onsman, & Brown, 2010). Harmann's single common factor showed that common method bias was not a concern, as a single factor explained 34% of the variance, thus well below the 50% threshold. As the correlation matrix showed the factors to be correlated, an oblique rotation (promax) was applied to the factor analysis. 3 items were deleted as they did not load on any factor and 11 further items with loading <.70 were removed. There were no cross-loadings above .40. Nine factors with eigenvalue >1 were extracted, with a cumulative variance of 71.42%. The factors represented the following users' motivation to engage with AR filters: *self-presentation* – specifically, *true, ideal,* and *transformed self*; *affiliation*; *social interactions*; *hedonic value*; *silliness*; *convenience*; *creative content curation*.

	Item loadings
True Self-Presentation (own elaboration and items adapted from Seidman, 2013; Seidman, 2014; Samper, Yang, & Daniels, 2017)	
To present my real self.	0.925
To communicate what my real life is about.	0.896
To express my true self.	0.917
To show who I really am.	0.927
To show the real me that others don't necessarily know much about.	0.873
Ideal Self-Presentation (own elaboration and items adapted from Seidman, 2013; Javornik et al., 2021)	
To improve the way I present myself.	0.86
To look more as how I would really like to look.	0.83
To hide some of my negative emotions.	0.846
To cover up my negative mood.	0.84
To fake a positive image.	0.835
Transformed Self-Presentation (own elaboration and items adapted from Lee, Kim and Fiore, 2010; de Kerviler & Rodriguez 2019)	
To experiment with my appearance.	0.845
To try out different looks.	0.828
To create a different version of who I am.	0.85
Filters transform me into someone else.	0.795
To modify my appearance in a new way.	0.856
Affiliation (own elaboration and items adapted from Escalas & Bettman (2003) and Milošević-Đorđević & Žeželj (2017))	
To communicate my support for a political or social cause.	0.852
To express my affiliation with a certain topic.	0.92
To express my opinion about specific topics in a visual way.	0.899
To depict my opinions.	0.9
Hedonic value (adapted from Ghani and Deshpande(1994) and Franke and Schreier (2010))	
Filters are fun.	0.928
I enjoy using filters.	0.92
I use filters for entertainment.	0.838
Silliness (own elaboration and adapted from Farace et al. (2017))	
To create a light-hearted content.	0.91
I use filters because they are comical.	0.874
To create ridiculous content.	0.851
To make the content silly.	0.914
Convenience (adapted from Franke & Schreier (2010))	
It is uncomplicated to use filters.	0.878
Filters require little effort to use.	0.909
Social Interaction (own elaboration and adapted from Voorveld et al. (2018), Mirbagheri and Najmi (2019) and Chen (2011))	
To get more engagement from my friends and followers (e.g. emoticons, tagging, reactions, comments).	0.865
To trigger an online exchange.	0.75
To draw attention of my followers.	0.861
To connect with my followers.	0.869

To feel closer with others.	0.78
Filters make me more connected with others on Instagram.	0.866
Creative Content Curation (own elaboration and adapted from Sheldon et al. (2017))	
Filters inspire me to be creative with my content.	0.906
I feel I create artistic content through filters.	0.891
To communicate creatively.	0.825
I am more creative with my content because of filters.	0.895
Filters' exploration (adapted from Lee, Kim, & Fiore (2010))	
Try an AR face filter that others (friends or brands) are using.	0.76
Search for new AR face filters.	0.845
Try out different AR face filters that are available.	0.875
Filters' use (adapted from Erz, Marder, & Osadchaya (2018))	
The content that I share has AR face filters.	0.92
AR face filters are part of my Instagram activity.	0.891
I use AR face filters when creating Instagram content.	0.93
When I interact on Instagram, I use AR face filters.	0.908
Positive affect (Watson, Clark, & Tellegen, 1988)	
Confident	0.817
Enthusiastic	0.85
Proud	0.777
Excited	0.841
Negative affect (Watson, Clark, & Tellegen, 1988)	
Distressed	0.851
Scared	0.873
Ashamed	0.753
Nervous	0.88
Self-Acceptance (Ryff, 1989)	
When I look at my life, I am pleased with how things have turned out.	0.76
In general, I feel confident and positive about myself.	0.873
I like most aspects of my personality.	0.776
When I compare myself to friends and acquaintances, it makes me feel good about who I am.	0.732

Table 1: Measurement items with factor loadings

Confirmatoy factor analysis

In order to examine the effects of the uses and gratifications on well-being and behavioural use, we specified a model in SmartPLS. We first conducted a confirmatory factor analysis. We again examined the measurement items of each factor. We removed three Ideal Self-Presentation items, as their VIF for outer loadings was >5, thus indicating multicollinearity issues. Upon that, CFA demonstrated appropriately high

factor loadings (>.70) for all the uses gratifications and the key outcome variables (see Appendix D) and all the items loadings were significant (p<.05). VIF values for the outer loadings were below 5 for all the items, indicating no multicollinearity issues. Moreover, convergent validity was established, as the composite reliability of the constructs was above .70, and the average variance extracted (AVE) was above the recommended .50 cut-off value (Hair et al. 2016). Also, the correlations between constructs were below the values of the square root of the constructs' AVE, thus confirming the discriminant validity of the factors (Fornell & Larcker, 1981). Also, HTMT criterion was below .90 cutoff value. Moreover, the scales displayed appropriate reliability. See Appendix D for the reported values.

Hypothesised relationships in the path model

Upon that, we estimated the paths in the model to test the effects of uses and gratifications on well-being measures and behavioural use of AR filters. We hypothesised the following effects: we postulated all the identified motivations to affect AR filters' use as well as the exploration of different AR filters. In terms of well-being outcomes, we expected all the self-related motivations, namely ideal, true and transformed self-presentation, as well as affiliation, to affect self-acceptance. Moreover, we hypothesised for the majority of the motivations to increase (decrease) the positive (negative) affect, except the ideal self-presentation, for which we hypothesised to decrease (increase) positive (negative) affect. See also Figure 2 for model visualisation.
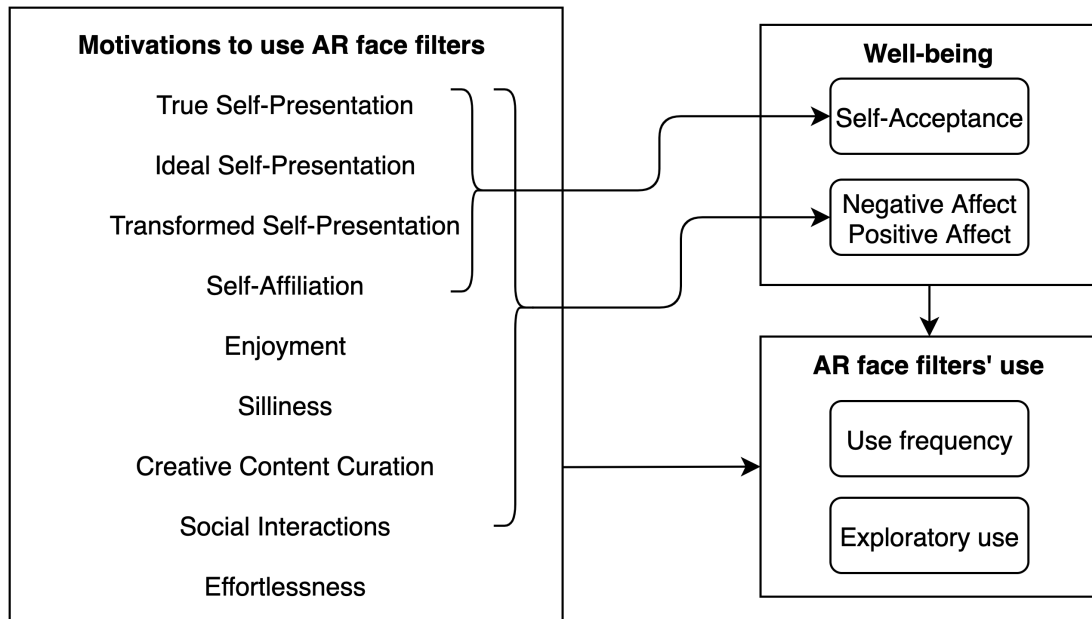
Figure 2: Model visualisation

We did not hypothesise convenience to impact the affect, because convenience demonstrates the filters' convenience and it was thus not expected to influence the affective state. Finally, we hypothesised that the well-being variables, i.e. self-acceptance and positive/negative affect, would further impact behavioural measures (filters' use and exploration). Specifically, we expected that self-acceptance would have a positive effect on the filters' use, as individuals would feel confident about themselves and thus comfortable using the filters. However, we expected a negative effect on the exploratory use of filters, in line with Javornik et al. (2021) who demonstrated that individuals with high self-esteem refrain from variety-seeking through AR. Moreover, we expected the positive (negative) mood to increase (decrease) filters' use and exploration. The hypothesized relationships are presented in Table 2.

	b	t	p	Hypothesis evaluation
Factor 1 - True self-presentation				
1. True self-presentation through AR face filters				
a) drives filters' use frequency.	0.06	1.17	0.24	Rejected
b) drives filters' exploration.	-0.06	1.2	0.22	Rejected
c) increases self-acceptance.	0.14	2.52	0.01	Supported
d) increases user's positive affect.	0.10	2.10	0.036	Supported
e) decreases user's negative affect.	0.09	1.46	0.14	Rejected
Factor 2 - Ideal self-presentation				

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2.	Ideal self-presentation through AR face filters				
a)	*drives filters' use frequency.*	0.22	4.64	<0.001	Supported
b)	*drives filters' exploration.*	0.08	1.42	0.16	Rejected
c)	*decreases self-acceptance.*	-0.27	4.52	<0.001	Supported
d)	*decreases user's positive affect.*	-0.10	1.78	0.08	Rejected
e)	*increases user's negative affect.*	0.27	4.63	<0.001	Supported
Factor 3 - Transformed self-presentation					
3.	Transformed self-presentation through AR face filters				
a)	*drives filters' use frequency.*	0.06	1.33	0.19	Rejected
b)	*drives filters' exploration.*	0.13	2.62	0.01	Supported
c)	*increases self-acceptance.*	0.13	2.07	0.04	Supported
d)	*increases user's positive affect.*	0.16	3.21	<0.01	Supported
e)	*decreases user's negative affect.*	0.01	0.14	0.89	Rejected
Factor 4 – Affiliation					
4.	Affiliation through AR face filters				
a)	*drives filters' use frequency.*	0.14	3.46	0.001	Supported
b)	*drives filters' exploration.*	-0.01	0.22	0.83	Rejected
c)	*increases self-acceptance.*	0.03	0.54	0.59	Rejected
d)	*increases user's positive affect.*	0.01	0.12	0.91	Rejected
e)	*decreases user's negative affect.*	0.02	0.45	0.65	Rejected
Factor 5 – Enjoyment					
5.	Enjoyment related to AR face filters				
a)	*drives filters' use frequency.*	0.12	3.12	0.002	Supported
b)	*drives filters' exploration.*	0.31	6.36	<0.001	Supported
c)	*increases user's positive affect.*	0.24	5.24	<0.001	Supported
d)	*decreases user's negative affect.*	-0.16	3.28	0.001	Supported
Factor 6 – Silliness					
6.	Silliness of AR face filters				
a)	*drives filters' use frequency.*	-0.08	2.19	0.03	Sig. opposite direction
b)	*drives filters' exploration.*	-0.03	0.58	0.56	Rejected
c)	*increases user's positive affect.*	0.03	0.68	0.50	Rejected
d)	*decreases user's negative affect.*	-0.03	0.57	0.57	Rejected
Factor 7 – Convenience					
7.	Convenience of AR face filters				
a)	*drives filters' use frequency.*	-0.02	0.40	0.69	Rejected
b)	*drives filters' exploration.*	0.10	2.23	0.03	Supported
Factor 8 – Social interaction					
8.	Social interaction via AR face filters				
a)	*drives filters' use frequency.*	0.17	3.32	0.001	Supported
b)	*drives filters' exploration.*	0.10	1.93	0.054	Partially supported
c)	*increases user's positive affect.*	0.15	2.88	0.004	Supported
d)	*decreases user's negative affect.*	0.20	3.55	<0.001	Sig. opposite direction
Factor 9 – Creative content curation					
9.	Creative content curation with AR face filters				
a)	*drives filters' use frequency.*	0.17	3.26	0.001	Supported
b)	*drives filters' exploration.*	0.10	2.05	0.041	Supported
c)	*increases user's positive affect.*	0.23	4.22	<0.001	Supported
d)	*decreases user's negative affect.*	-0.08	1.30	0.193	Rejected
Well-being => AR face filters' use					
10.	Negative affect				
a)	decreases filters' use frequency.	-0.05	1.49	0.14	Rejected
b)	decreases filters' exploration.	-0.10	2.29	0.02	Supported
11.	Positive affect				
a)	drives filters' use frequency.	0.14	3.50	<0.001	Supported

b)	drives filters' exploration.	0.19	3.72	<0.001	Supported
12. Self-acceptance					
a)	drives filters' use frequency.	-0.01	0.39	0.70	Rejected
b)	decreases filters' exploration.	-0.09	2.10	0.04	Supported

Table 2 – Hypothesised relationships with path coefficients

Model fit

We estimated the model in Smart-PLS. The model fit criterion indicated that the estimated model had an acceptable fit, as SRMR was .06, thus below the cutoff value of .08 (Hu & Bentler, 1999). The model was deemed to be a robust, reliable, and valid assessment of the relationships between users' gratifications, well-being, and behvaioural use of AR face filters.

Path coefficients

We then estimated the significance of the path coefficients with bootstrapping (5000 subsamples, 95% confidence intervals), which allowed for testing the hypotheses. Path coefficients are displayed in Table 2. We now comment on specific gratifications and the key results.

Filters' use and exploration - The results showed that neither true nor transformed self-presentation were significant motivators for the filters' use. Conversely, the presentation of an ideal self through AR filters significantly drives the use of the filters, as does also the affiliation of the self to relevant causes and opinions. In terms of behaviour related to self-presentation and filters' exploration, users are only motivated to do so when engaging in self-transformation. Further on, participants reported using and exploring AR filters because of the enjoyment they derive from them. Conversely, silliness decreases the behaviour, the opposite of our hypothesized relationship. Moreover, the effortless manner with which the filters can be applied increases the

exploration of different filters. However, this is not a significant motivator for the use itself. Importantly, participants reported using AR face filters because of their need to engage in social interactions, but the exploration of filters was only marginally significant in that regard. Finally, the need to curate Instagram content was revealed to be a key driver for both the use and the exploration of such filters.

Impact of the motivations to use AR face filters on well-being – When participants use AR face filters with the aim of presenting who they truly are, this increases their self-acceptance and positive mood, with no detected effect on the negative mood. However, when motivated to depict their ideal self, this has a negative impact on their self-acceptance and it increases a negative mood. Using the filters for transforming self-presentation is increasing a person's self-acceptance and improving their positive mood (while not affecting the negative one). Affiliation was shown to have no effect on the well-being variables. Enjoyment, as expected, was demonstrated to have a positive impact on users' positive mood and it also decreased the negative mood. However, silliness revealed no such effects, indicating that the silliness of the filters is less impactful than enjoyment, even though silliness and enjoyment are conceptually rather close. Importantly, when AR filters are used to foster social interactions, that increases users' positive affect, but it also increased the negative one, the opposite of what we hypothesised. The process of content curation via AR filters was also shown to increase users' positive mood (but did not counteract the negative one).

Finally, we identified significant results related to the well-being state which is experienced during the use of AR face filters and how that affects the behavioural measures. Specifically, if in a state of positive affect during the use of filters, that leads to a more frequent use of filters and also the exploration of different filters. However, when users experience a negative mood while using the filters, that decreases their

exploration of the filters, but it does not stop them from using the filters. Finally, while the self-acceptance that occurrs during the use of the filters was not shown to decrease the filters' use, it did decrease an exploration of different filters, in line with our hypothesis.

4. General discussion

Though AR face filters are a widely used and a prominent feature for major social media platforms such as Instagram, to date there has been no examination of what motivates people to use them. We fill this important gap, offering the following motivations underpinning the use of AR face filters: *ideal* and *transformed self-presentation*, *affiliation*, *enjoyment*, *convenience*, *social interaction* and *creative content curation*. Furthermore, we show how different motivations drive differences in filter usage (frequency and exploration) and user well-being (affect and self-acceptance), as well as the link between well-being and usage. Overall, we uncover important and unexpected complexities that accompany individuals' use of these visually powerful features on social media, allowing for three theoretical contributions.

4.1 Motivations: Why are AR face filters used?

Firstly, we contribute specific motivations for AR filter usage and situate these within the broader U&G landscape. Our findings support both unique motivators of AR filters alongside the previously established motivations. Existing related U&G studies have broadly treated self-presentational motive as a singular dimension, associated with self-enhancement (i.e. presenting an ideal self) to boost one's image in front of online audiences, for example in the context of hashtags (Erz, Marder, & Osadchaya, 2018), AI-based voice assistants (McLean & Kofi Osei-Frimpong, 2019) and general social media use (Sheldon et al. 2017). This uni-dimensional approach to self-presentation is

mirrored in other closely related AR studies (Rauschnabel, 2018; Jang & Liu, 2020).
We find when virtually modifying one's appearance in real-time for self-presentational
purposes, users engage in a complex process of visually depicting themselves, driven
by ideal, true and transformed selves. We further expand upon this important point later
on below.

We establish creative content creation as a unique motivation for AR face filter
usage. While creativity, in general terms, has previously been identified as a driver for
social media use (Mull & Lee, 2014; Sheldon et al. 2017), though often omitted in U&G
studies of Instagram (Phua, Jin, & Kim, 2017; Ponnusamy et al. 2020), we demonstrate
that AR face filters foster a specific type of creativity. Specifically, AR filters both
inspire and allow for creativity in the curation of visually appealing social media
content, content creation arguably being the raison d'etre of Instagram (Kostyk, &
Huhmann, 2021), as users express their preferences or admiration, for instance towards
a destination (Filieri, Yen, & Yu, 2021) or post more extreme content to attract attention
(Bigley & Leonhardt, 2018). Thus complementing general photo- or video-based
content, AR face filters provide a novel vehicle for content creation based on their
unique characteristics – a real-time overlay of virtual elements that can be applied
effortlessly and with a high level of realism.

Furthermore, we support that enjoyment and social interactions as two
previously established motivations for AR use (Rauschnabel, 2018; Jang & Liu, 2020)
are also important drivers for AR face filters. Enjoyment as a significant motivation for
both exploratory use and use frequency reinforces the importance of hedonic benefits
with digital technology (McLean & Kofi Osei-Frimpong, 2019). In contrast, silliness
was shown to decrease the use of the filters, despite identifying this motivation in our
interviews and silliness being previously highlighted in social media literature (Farace
et al. 2017). We explain this lack of effect by considering the typical use of Instagram.

Silly AR-based representation generates visualisations that can appear ridiculous and pointless to some, while others might respond positively to the affective undertone that such silliness embodies (Katz & Shifman, 2017). Such interpretation might carry a certain risk of negative impression management on a platform that is dedicated to visually perfect content (Colliander, & Marder, 2018; Kostyk, & Huhmann, 2021). On the other hand, it might be a more prominent factor on platforms like Snapchat where interactions take place in a smaller group with stronger ties (Piwek & Joinson, 2016). Other personality or platform-related factors could moderate the effect of silliness on frequency use. In addition, we find filters are used to support social interaction, another key motivation of media and technology use (Sheldon et al. 2017). Specifically, AR filters are used as a conversation starter, to seek the attention of others and to initiate social interactions. As users enter into social interactions through virtually augmenting themselves, the social psychology of online interactions becomes more complex (Turkle, 1994). Furthermore, we support convenience as a driver for AR filter interactions, similar to prior studies that have established ease of use, convenience and efficiency as antecedents of platform and feature usage (Rauschnabel, 2018; McLean & Kofi Osei-Frimpong, 2019; Erz, Marder, & Osadchaya, 2018).

4.2 Multifaceted self-presentational motive: Idealized, true or different me?

Secondly, we contribute a novel understanding of the multifaceted nature of the self-presentation motive for AR filters. Our findings highlight the dominance of a self-enhancement motive driving AR filter use, supporting the focus on this dimension in prior work (e.g. Erz, Marder, & Osadchaya, 2018; Rauschnabel, 2018; Jang & Liu, 2020). However, simply viewing self-presentation as synonymous with self-enhancement (or idealized selves) can risk being somewhat myopic. Our interviews support that AR filter interaction is linked with two further self-presentational motives.

First, we support the 'true', authentic self as a motivator, in line with related work on drivers of social media use (McKenna et al., 2002; Hollenbeck & Kaikati, 2013). Albeit the case that true self-motivation did not predict the frequency of filter usage, it was positively related to self-acceptance and to positive mood. Findings also align with the notion that the true and ideal self-presentations lie at different ends of a continuum (Zhao, Grasmuck & Martin 2008), as our participants discussed differing intensity on which idealisation can be realised through filters – from lightly enhancing the true self by smoothening the skin, to covering flaws or, when taken to an extreme, faking an intensely beautified appearance or portraying a cool image that hides any insecurities. This potentially calls for rebalancing ideal and true self-presentation via the filters for emotional regulation purposes, as we find true/ideal self motives associate with negative/positive affect respectively. Second, we highlight the exploration of selves (i.e. transformed self) as another facet of an overarching self-presentation motive. Specifically, interviews revealed that individuals commonly used AR filters to explore different representations of themselves, hence this motive predicted exploratory use of filters, though not frequency. These findings extend Javornik et al. (2021) who showed that AR make-up filters can facilitate self-experimentation, but suggest such experimentation is a private rather than a public activity. Thus it appears that users prefer playful experimentation through browsing filters without necessary sharing these. This concurs with prior research that has distinguished between private vs. public impression management (e.g. Rui and Stefanone, 2013). Future studies into self-presentation through AR filters and other technologies more broadly should consider the potential for self-presentation motives to be multifaceted in order to gain a comprehensive understanding of this critical overarching motive (Erz, Marder, & Osadchaya, 2018).

4.3 Well-being effects: How do people feel when using AR face filters?

Finally, we contribute new insights that face augmentation through filters impacts well-being, which we examined both in terms of self-acceptance and positive/negative affect. We establish that the usage driven by true or transformed self motives increase self-acceptance, whereas usage motivated by ideal self-presentation reduces self-acceptance. This highlights how this prominent social media feature can directly affect a user's self-concept and thus their subjective well-being (Ryff, 1989), corroborating recent findings that AR make-up try-on changes individuals' ideal-actual gap and can decrease their tolerance of perceived appearance flaws (Javornik et al., 2021). However, we extend this work showing that AR filter usage can lead to positive effects if driven by self-transformation or true self-presentations. This aligns with broader work that positively links social media engagement and self-acceptance for older people or the LGBT community members (Fox, & Ralston, 2016; Pera, Quinton, & Baima, 2020). Additionally, we show varying effects of the different motivations on one's affective state. While a positive mood was increased by true and transformed self-presentation, enjoyment, social interaction and creative content, conversely, a negative mood was increased by ideal self-presentation and social interaction. This indicates that the use of AR filters can be beneficial and have a positive effect on mood, but with some exceptions. Idealising or faking one's image can have a negative consequence, which further highlights the damaging consequences of social media with regards to conveying unreasonable body image expectations (Hogue, & Mills, 2019) and constant social comparison (Chae, 2017). Moreover, while using filters for boosting social engagement can lift users' positive mood, there is also an increase in negative affect as they can be nervous about whether their filtered content will be well received (Alkis, Kadirhan, & Sat, 2017). This is reminiscent of the dual emotional responses that can emerge as a result of social interactions online (Archer-Brown et al., 2018).

5. Practical implications

The findings from our study offer important implications for policymakers/educators, site designers, and social media managers:

- *Design implications*. Site and app designers could consider informing the social media users more clearly about the unintended consequences of such filters, for instance via automated pop-ups. Such communication could either focus on affirming positive self-image and help to mitigate the reliance on augmentation, which can cause selfie dysmorphia and in some cases drive users to undertake aesthetic surgery.

- *Brands' use of AR face filters for affiliation*. Social media managers should be encouraged by our findings that users are motivated to affiliate themselves with relevant causes or topics via AR face filters. Brands and organisations can look to invest in bespoke AR face filters to promote brand associations or socially important causes. As consumers seek to align themselves with brands that foster positive societal outcomes and are purpose-driven (Hajdas & Kleczek, 2021), AR filters may present new opportunities in terms of engaging consumers.

- *Creative content co-curation.* Additionally, our research demonstrates a unique outcome with regards to user-generated content (UGC) in that creative content curation was a key driver of AR filter use. Organisations and brands should consider the use of AR face filters in a manner that would foster users' creativity.

6. Limitations and further research

Limitations associated with this research may provide opportunities for future studies. This study focused on one country, the UK. Future studies could potentially explore cross-cultural differences in terms of AR filters' use. Also, we did not examine the

long-term effects of filters' use - deploying a longitudinal research design could help understand how such effects develop over time. Future studies could compare AR filters across other platforms to determine if the results differ depending on the type of social media. Such efforts would contribute towards a more comprehensive understanding of this exciting technology and its integration on social media. Moreover, this research has taken the first steps in examining the use of AR face filters on an individual's wellbeing. Future research should explore in more detail the varying types of face filters and the specific effect these have on well-being. Relatedly, there are calls for ethical policies on AR face filters (UK Government - House of Commons, 2019, 2020; Vogue, 2021), however, there have been no such concrete outputs so far. Our research provides important empirical support for these needed developments. In 2019 Instagram blocked filters that visualised cosmetic surgery treatments. While such actions are helpful, further research could offer more insights to pave a way for a more comprehensive policy that would tackle the damaging psychological effects of AR face filters and to promote responsible usage and provision.

Finally, the quantitative portion of this study primarily focused on one social media platform. Future studies could compare AR filters across other platforms to determine if the results differ depending on the type of social media. Such efforts would contribute towards a more comprehensive understanding of this exciting technology and its integration on social media.

References:

Alha, K., Koskinen, E., Paavilainen, J., & Hamari, J. (2019). Why do people play location-based augmented reality games: a study on Pokémon GO. *Computers in Human Behavior*, *93*, 114-122.

Alkis, Y., Kadirhan, Z., & Sat, M. (2017). Development and validation of social anxiety scale for social media users. *Computers in Human Behavior*, *72*, 296-303.

Alt, D. (2015). College students' academic motivation, media engagement and fear of missing out. *Computers in Human Behavior*, *49*, 111-119.

Archer-Brown, C., Marder, B., Calvard, T., & Kowalski, T. (2018). Hybrid social media: Employees' use of a boundary-spanning technology. *New Technology, Work and Employment*, *33*(1), 74-93.

Back, M. D., Stopfer, J. M., Vazire, S., Gaddis, S., Schmukle, S. C., Egloff, B., & Gosling, S. D. (2010). Facebook profiles reflect actual personality, not self-idealization. *Psychological science*, *21*(3), 372-374.

Barhorst, J. B., McLean, G., Shah, E., & Mack, R. (2021). Blending the real world and the virtual world: Exploring the role of flow in augmented reality experiences. *Journal of Business Research*, *122*, 423-436.

Batat, W., Peter, P. C., Moscato, E. M., Castro, I. A., Chan, S., Chugani, S., & Muldrow, A. (2019). The experiential pleasure of food: A savoring journey to food well-being. *Journal of Business Research*, *100*, 392-399.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological bulletin*, *117*(3), 497.

Berezan, O., Krishen, A. S., Agarwal, S., & Kachroo, P. (2018). The pursuit of virtual happiness: Exploring the social media experience across generations. *Journal of Business Research*, *89*, 455-461.

Best, P., Manktelow, R., & Taylor, B. (2014). Online communication, social media and adolescent wellbeing: A systematic narrative review. *Children and Youth Services Review*, *41*, 27-36.

Beyens, I., Pouwels, J. L., van Driel, I. I., Keijsers, L., & Valkenburg, P. M. (2020). The effect of social media on well-being differs from adolescent to adolescent. *Scientific Reports*, *10*(1), 1-11.

Bhatt, S. (2020). The big picture in the entire AR-filter craze. Retrieved from: https://economictimes.indiatimes.com/internet/brands-see-the-big-picture-in-ar-filter-craze/articleshow/78266655.cms?from=mdr

Bigley, I. P., & Leonhardt, J. M. (2018). Extremity bias in user-generated content creation and consumption in social media. *Journal of Interactive Advertising*, *18*(2), 125-135.

Bue, A. C. C. (2020). The looking glass selfie: Instagram use frequency predicts visual attention to high-anxiety body regions in young women. *Computers in Human Behavior*, *108*, 106329.

Caruso, E. M., & Shafir, E. (2006). Now that I think about it, I'm in the mood for laughs: decisions focused on mood. *Journal of Behavioral Decision Making*, *19*(2), 155-169.

Chae, J. (2017). Virtual makeover: Selfie-taking and social media use increase selfie-editing frequency through social comparison. *Computers in Human Behavior*, *66*, 370-376.

Chatzopoulou, E., Filieri, R., & Dogruyol, S. A. (2020). Instagram and body image: Motivation to conform to the "Instabod" and consequences on young male well-being. *Journal of Consumer Affairs*, *54*(4), 1270-1297.

Chen, G. M. (2011). Tweet this: A uses and gratifications perspective on how active Twitter use gratifies a need to connect with others. *Computers in Human Behavior*, *27*(2), 755-762.

Chen, G. M. (2012). Why do women write personal blogs? Satisfying needs for self-disclosure and affiliation tell part of the story. *Computers in Human Behavior*, *28*(1), 171-180.

Choi, T. R., & Sung, Y. (2018). Instagram versus Snapchat: Self-expression and privacy concern on social media. *Telematics and informatics*, *35*(8), 2289-2298.

Choukas-Bradley, S., Nesi, J., Widman, L., & Galla, B. M. (2020). The appearance-related social media consciousness scale: Development and validation with adolescents. *Body image*, *33*, 164-174.

Colliander, J., & Marder, B. (2018). 'Snap happy' brands: Increasing publicity effectiveness through a snapshot aesthetic when marketing a brand on Instagram. *Computers in Human Behavior*, *78*, 34-43.

Csikszentmihalyi, M. (1997). Flow and the psychology of discovery and invention. *HarperPerennial, New York*.

de Kerviler, G., & Rodriguez, C. M. (2019). Luxury brand experiences and relationship quality for Millennials: The role of self-expansion. *Journal of Business Research*, *102*, 250-262.

de Ruyter, K., Heller, J., Hilken, T., Chylinski, M., Keeling, D. I., & Mahr, D. (2020). Seeing with the customer's eye: Exploring the challenges and opportunities of AR advertising. *Journal of Advertising*, *49*(2), 109-124.

de Vries, L., Peluso, A. M., Romani, S., Leeflang, P. S., & Marcati, A. (2017). Explaining consumer brand-related activities on social media: An investigation of the different roles of self-expression and socializing motivations. *Computers in Human Behavior*, *75*, 272-282.

Dennis, C., Bourlakis, M., Alamanos, E., Papagiannidis, S., & Brakus, J. J. (2017). Value co-creation through multiple shopping channels: The interconnections with social exclusion and well-being. *International Journal of Electronic Commerce*, *21*(4), 517-547.

Diener, E., & Emmons, R. A. (1984). The independence of positive and negative affect. *Journal of personality and social psychology*, *47*(5), 1105-1117.

Escalas, J. E., & Bettman, J. R. (2003). You are what they eat: The influence of reference groups on consumers' connections to brands. *Journal of Consumer Psychology*, *13*(3), 339-348.

Erz, A., Marder, B., & Osadchaya, E. (2018). Hashtags: Motivational drivers, their use, and differences between influencers and followers. *Computers in Human Behavior*, *89*, 48-60.

Farace, S., van Laer, T., de Ruyter, K., & Wetzels, M. (2017). Assessing the effect of narrative transportation, portrayed action, and photographic style on the likelihood to comment on posted selfies. *European Journal of Marketing*. 51 (11/12), pp. 1961-1979.

Filieri, R., Yen, D. A., & Yu, Q. (2021). # ILoveLondon: An exploration of the declaration of love towards a destination on Instagram. *Tourism Management*, *85*, 104291.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39-50.

Fox, J., & Ralston, R. (2016). Queer identity online: Informal learning and teaching experiences of LGBTQ individuals on social media. *Computers in Human Behavior*, *65*, 635-642.

Franke, N., & Schreier, M. (2010). Why customers value self-designed products: The importance of process effort and enjoyment. *Journal of Product Innovation management*, *27*(7), 1020-1031.

Ghani, J. A., & Deshpande, S. P. (1994). Task characteristics and the experience of optimal flow in human—computer interaction. *Journal of Psychology*, *128*(4), 381-391.

Ghazali, E. M., Mutum, D. S., & Woon, M. Y. (2019). Multiple sequential mediation in an extended uses and gratifications model of augmented reality game Pokémon Go. *Internet Research*.

Gioia, D. A., Price, K. N., Hamilton, A. L., & Thomas, J. B. (2010). Forging an identity: An insider-outsider study of processes involved in the formation of organizational identity. *Administrative science quarterly*, *55*(1), 1-46.

Hajdas, M., & Kłeczek, R. (2021). The real purpose of purpose-driven branding: consumer empowerment and social transformations. *Journal of Brand Management*, 1-15.

Hamari, J., Malik, A., Koski, J., & Johri, A. (2019). Uses and gratifications of pokémon go: Why do people play mobile location-based augmented reality games?. *International Journal of Human–Computer Interaction*, *35*(9), 804-819.

Hilken, T., de Ruyter, K., Chylinski, M., Mahr, D., & Keeling, D. I. (2017). Augmenting the eye of the beholder: exploring the strategic potential of augmented reality to enhance online service experiences. *Journal of the Academy of Marketing Science*, *45*(6), 884-905.

Hoffman, D. L., Novak, T. P., & Kang, H. (2017). Let's get closer: Feelings of connectedness from using social media, with implications for brand outcomes. *Journal of the Association for Consumer Research*, *2*(2), 216-228.

Hogue, J. V., & Mills, J. S. (2019). The effects of active social media engagement with peers on body image in young women. *Body image*, *28*, 1-5.

Hong, S., Jahng, M. R., Lee, N., & Wise, K. R. (2020). Do you filter who you are?: Excessive self-presentation, social cues, and user evaluations of Instagram selfies. *Computers in Human Behavior*, *104*, 106159.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, *6*(1), 1-55.

Hunt, E. (2019). Faking it: how selfie dysmorphia is driving people to seek surgery. *Guardian*. Retrieved from: https://www.theguardian.com/lifeandstyle/2019/jan/23/faking-it-how-selfie-dysmorphia-is-driving-people-to-seek-surgery

Huta, V., & Ryan, R. M. (2010). Pursuing pleasure or virtue: The differential and overlapping well-being benefits of hedonic and eudaimonic motives. *Journal of happiness studies*, *11*(6), 735-762.

Jang, S., & Liu, Y. (2020). Continuance use intention with mobile augmented reality games. *Information Technology & People, 33*(1), 37-55.

Javornik, A., Rogers, Y., Moutinho, A. M., & Freeman, R. (2016). Revealing the shopper experience of using a" magic mirror" augmented reality make-up application. In *Conference on designing interactive systems, Association for Computing Machinery (ACM)*, 2016, 871-882.

Javornik, A., Marder, B., Pizzetti, M., & Warlop, L. (2021). Augmented self - The effects of virtual face augmentation on consumers' self-concept. *Journal of Business Research*, *130*, 170-187.

Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *The public opinion quarterly*, *37*(4), 509-523.

Katz, Y., & Shifman, L. (2017). Making sense? The structure and meanings of digital memetic nonsense. *Information, Communication & Society*, *20*(6), 825-842.

Keles, B., McCrae, N., & Grealish, A. (2019) A systematic review: the influence of social media on depression, anxiety and psychological distress in adolescents, *International Journal of Adolescence and Youth,* 25, 1, 79-93.

Kim, J., & Lee, J. E. R. (2011). The Facebook paths to happiness: Effects of the number of Facebook friends and self-presentation on subjective well-being. *CyberPsychology, behavior, and social networking*, *14*(6), 359-364.

Kostyk, A., & Huhmann, M. (2020). Perfect social media image posts: symmetry and contrast influence consumer response. *European Journal of Marketing*.

Lavertu, L., Marder, B., Erz, A., & Angell, R. (2020). The extended warming effect of social media: Examining whether the cognition of online audiences offline drives prosocial behavior in 'real life'. *Computers in Human Behavior*, *110*, 106389.

Lee, M., & Lee, H. H. (2021). Social media photo activity, internalization, appearance comparison, and body satisfaction: The moderating role of photo-editing behavior. *Computers in Human Behavior*, *114*, 106-579.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage.

Locke, K. (1996). A funny thing happened! The management of consumer emotions in service encounters. *Organization Science*, *7*(1), 40-59.

Matney, L. (2020). Instagram's AR filters are getting more dynamic. Retrieved from https://techcrunch.com/2020/05/27/instagrams-ar-filters-are-getting-more-dynamic/

Marder, B., Joinson, A., Shankar, A., & Thirlaway, K. (2016). Strength matters: Self-presentation to the strongest audience rather than lowest common denominator when faced with multiple audiences in social network sites. *Computers in Human Behavior*, *61*, 56-62.

McKenna, K. Y., Green, A. S., & Gleason, M. E. (2002). Relationship formation on the Internet: What's the big attraction?. *Journal of social issues*, *58*(1), 9-31.

McLean, S. A., Paxton, S. J., Wertheim, E. H., & Masters, J. (2015). Photoshopping the selfie: Self photo editing and photo investment are associated with body dissatisfaction in adolescent girls. *International Journal of Eating Disorders*, *48*(8), 1132-1140.

McLean, G. & Osei-Frimpong, K. (2019) Hey Alexa… examine the variables influencing the use of artificial intelligent in-home voice assistants, *Computers in Human Behavior,* 99, 28-37.

McLean, G., Osei-Frimpong, K., & Barhorst, J. (2021). Alexa, do voice assistants influence consumer brand engagement?–Examining the role of AI powered voice assistants in influencing consumer brand engagement. *Journal of Business Research*, 124, 312-328.

McQuail, D. (1984). With the benefit of hindsight: Reflections on uses and gratifications research. *Critical Studies in Media Communication*, *1*(2), 177-193.

Milošević-Đorđević, J. S., & Žeželj, I. L. (2017). Civic activism online: Making young people dormant or more active in real life?. *Computers in Human Behavior*, *70*, 113-118.

Mirbagheri, S., & Najmi, M. (2019). Consumers' engagement with social media activation campaigns: Construct conceptualization and scale development. *Psychology & marketing*, *36*(4), 376-394.

Mueller, F. F., Lopes, P., Strohmeier, P., Ju, W., Seim, C., Weigel, M., Nanayakkara, S., Obrist, M., Li, Z., Delfa, J., Nishida, J., Gerber, E, Svanaes, D., Grudin, J., Greuter, S., Kunze, K., Erickson, T., Greenspan, S., Inami, M., Marshall, J., Reiterer, H., Wolf, K., Meyer, J., Schiphorst, T., Wang, D., & Maes, P. (2020). Next Steps for Human-Computer Integration. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1-15).

Mull, I. R., & Lee, S. E. (2014). "PIN" pointing the motivational dimensions behind Pinterest. *Computers in Human Behavior*, *33*, 192-200.

Muninger, M. I., Hammedi, W., & Mahr, D. (2019). The value of social media for innovation: A capability perspective. *Journal of Business Research*, *95*, 116-127.

Olafson, K. (2020). How to Make Your Own Instagram AR Filters: A Step-by-Step Guide. Retrieved from https://blog.hootsuite.com/instagram-ar-filters/

Pera, R., Quinton, S., & Baima, G. (2020). I am who I am: Sharing photos on social media by older consumers and its influence on subjective well-being. *Psychology & Marketing*, *37*(6), 782-795.

Phua, J., Jin, S. V., & Kim, J. J. (2017). Gratifications of using Facebook, Twitter, Instagram, or Snapchat to follow brands: The moderating effect of social comparison, trust, tie strength, and network homophily on brand identification, brand engagement, brand commitment, and membership intention. *Telematics and Informatics*, *34*(1), 412-424.

Pitcher, L. (2020). Instagram Filters are Changing the Way We Think About Make-Up. Retrieved from https://www.teenvogue.com/story/instagram-filters-makeup

Piwek, L., & Joinson, A. (2016). "What do they snapchat about?" Patterns of use in time-limited instant messaging service. *Computers in human behavior*, *54*, 358-367.

Ponnusamy, S., Iranmanesh, M., Foroughi, B., & Hyun, S. S. (2020). Drivers and outcomes of Instagram Addiction: Psychological well-being as moderator. *Computers in Human Behavior*, *107*, 106294.

Rauschnabel, P. A. (2018). Virtually enhancing the real world with holograms: An exploration of expected gratifications of using augmented reality smart glasses. *Psychology & Marketing*, *35*(8), 557-572.

Rauschnabel, P. A., He, J., & Ro, Y. K. (2018). Antecedents to the adoption of augmented reality smart glasses: A closer look at privacy risks. *Journal of Business Research*, *92*, 374-384.

Rauschnabel, P. A., Rossmann, A., & tom Dieck, M. C. (2017). An adoption framework for mobile augmented reality games: The case of Pokémon Go. *Computers in Human Behavior*, *76*, 276-286.

Rauschnabel, P. A., Felix, R., & Hinsch, C. (2019). Augmented reality marketing: How mobile AR-apps can improve brands through inspiration. *Journal of Retailing and Consumer Services*, *49,* 43-53.

Rajanala, S., Maymone, M. B., & Vashi, N. A. (2018). Selfies—living in the era of filtered photographs. *JAMA facial plastic surgery*, *20*(6), 443-444.

Ray, A., Dhir, A., Bala, P. K., & Kaur, P. (2019). Why do people use food delivery apps (FDA)? A uses and gratification theory perspective. *Journal of Retailing and Consumer Services*, 51, 221-230.

Reinecke, L., & Trepte, S. (2014). Authenticity and well-being on social network sites: A two-wave longitudinal study on the effects of online authenticity and the positivity bias in SNS communication. *Computers in Human Behavior*, *30*, 95-102.

Rui, J. R., & Stefanone, M. A. (2013) Strategic image management online, *Information, Communication & Society*, 16, 8, 1286-1305.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of personality and social psychology*, *57*(6), 1069.

Samper, A., Yang, L. W., & Daniels, M. E. (2018). Beauty, effort, and misrepresentation: How beauty work affects judgments of moral character and consumer preferences. *Journal of Consumer Research*, *45*(1), 126-147.

Scholz, J., & Duffy, K. (2018). We ARe at home: How augmented reality reshapes mobile marketing and consumer-brand relationships. *Journal of Retailing and Consumer Services*, *44*, 11-23.

Seidman, G. (2013). Self-presentation and belonging on Facebook: How personality influences social media use and motivations. *Personality and individual differences*, *54*(3), 402-407.

Seidman, G. (2014). Expressing the "true self" on Facebook. *Computers in Human Behavior*, *31*, 367-372.

Sheldon, K. M., Gunz, A., & Schachtman, T. R. (2012). What does it mean to be in touch with oneself? Testing a social character model of self-congruence. *Self and Identity*, *11*(1), 51-70.

Sheldon, P., Rauschnabel, P. A., Antony, M. G., & Car, S. (2017). A cross-cultural comparison of Croatian and American social network sites: Exploring cultural differences in motives for Instagram use. *Computers in human behavior*, *75*, 643-651.

Spark AR (2021). Categories for Effects. Retrieved from https://sparkar.facebook.com/ar-studio/learn/publishing/categories-for-instagram-effects/#how-to-select-categories-for-your-effect

Steinsbekk, S., Wichstrøm, L., Stenseng, F., Nesi, J., Hygen, B. W., & Skalická, V. (2021). The impact of social media use on appearance self-esteem from childhood to adolescence–A 3-wave community study. *Computers in Human Behavior*, *114*, 106-528.

Statista (2021) Distribution of Instagram users worldwide as of January 2021. Statista Online, Available From: https://www.statista.com/statistics/325587/instagram-global-age-group/#:~:text=With%20roughly%20one%20billion%20monthly,million%20million%20Instagram%20users%20each [Accessed 11/02/21]

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research*. Sage.

Sung, Y., Lee, J. A., Kim, E., & Choi, S. M. (2016). Why we post selfies: Understanding motivations for posting pictures of oneself. *Personality and Individual Differences*, *97*, 260-265.

Throuvala, M. A., Griffiths, M. D., Rennoldson, M., & Kuss, D. J. (2019). Motivational processes and dysfunctional mechanisms of social media use among adolescents: A qualitative focus group study. *Computers in Human Behavior*, *93*, 164-175.

Tosun, L. P. (2012). Motives for Facebook use and expressing "true self" on the Internet. *Computers in human behavior*, *28*(4), 1510-1517.

Turkle, S. (1994). Constructions and reconstructions of self in virtual reality: Playing in the MUDs. *Mind, Culture, and Activity*, *1*(3), 158-167.

UK Government – House of Commons (2019). Oral evidence: Immersive and addictive technologies, HC 1846. http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/digitalculture-media-and-sport-committee/immersive-and-addictive-technologies/oral/98431.html

UK Government – House of Commons (2020). Oral evidence: Changing the perfect picture: an inquiry into body image, HC 274 https://committees.parliament.uk/oralevidence/1439/default/

Vendemia, M. A., & DeAndrea, D. C. (2018). The effects of viewing thin, sexualized selfies on Instagram: Investigating the role of image source and awareness of photo editing practices. *Body image*, *27*, 118-127.

Vogue (2021). The ethics and future of flattering AR filters

https://www.voguebusiness.com/technology/the-ethics-and-future-of-flattering-ar-filters [Accessed 30/03/21]

Voorveld, H. A., Van Noort, G., Muntinga, D. G., & Bronner, F. (2018). Engagement with social media and social media advertising: The differentiating role of platform type. *Journal of Advertising*, *47*(1), 38-54.

We Are Social (2020) Digital in 2020, The world's most used social platforms. Available from: https://wearesocial.com/digital-2020 [Accessed 11/02/21]

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology*, *54*(6), 1063.

Williamson, A. (2020). Augmented Reality in Social Media. Retrieved from https://www.emarketer.com/content/augmented-reality-in-social-media

Yee, N., & Bailenson, J. (2007). The Proteus effect: The effect of transformed self-representation on behavior. *Human communication research*, *33*(3), 271-290.

Zhao, S., Grasmuck, S., & Martin, J. (2008). Identity construction on Facebook: Digital empowerment in anchored relationships. *Computers in human behavior*, *24*(5), 1816-1836.

Zheng, A., Duff, B. R. L., Vargas, P., Yao, M. Z. (2020) Self-presentation on social media: when self-enhancement confronts self-verification, *Journal of Interactive Advertising*, 20, 3, 289-302.

Appendix A – Interview Questions

Demographic data:
- Name and surname (audio recording up to this point will be eliminated from the recordings that will be shared with the third party conducting interviews' transcription)
- Age, gender, occupation / education, no of followers, frequency of platform use, time period of using the platform (since when)

Each participant is asked to show a recent example of them using an AR filter.

General questions:
How long have you been using Instagram? How often do you use Instagram / Snapchat?
Could you tell me how do you typically use Instagram / Snapchat?
How important is Instagram / Snapchat for you? What does it represent to you?
What do you most often post about?

Do you use Instastories / Snaps?
How do you decide to post an Instastory / Snap – what motivates you?
What typically features on your Instastories / Snaps?
How do you decide if you record yourself for Instastories / Snaps so that you feature in it?
How would you like to present yourself online through Instastories / Snaps?

Questions related to the use of AR face filters:

AR filter uses and habits
What different types of AR selfie filters have you seen on Instagram / Snapchat?
Which ones have you tried?
Which filters do you not like using? Why?
Do you have a favourite AR filter? What do you like about it?
How do you usually use it? How do you decide on the filter?
Where do you find such filters / how do you look for filters?
Have you noticed any change in terms of what type of filter you use now as opposed to when you first started using them?

*AR filter gratifications (*information, entertainment, social interaction, personal identity & convenience*)*

Why do you use face filters?
What do these filters contribute to your Instastories / Snaps?
What do these filters represent to you?
What do you wish to communicate with them?
Do you use filters to communicate specific information about you or the world? If yes, what type of information?
Do you find it useful or convenient to apply the filters? If yes, why?
Do they make the Instastories / Snaps more entertaining or fun? If yes, how?
How do your followers react to your filters?
Do you think these filters make a difference in terms of how the online audience then interacts with you on (Instagram or SnapChat, depending on which platform they use for filters)? If yes, how? Can you connect to your followers or IG community in a different way because of these?
What do the filters symbolize in terms of your personal identity? Do AR selfie filters change the way you present yourself online? (If yes, how?) What do you express with AR filters that you could not express otherwise?

Self-perception and well-being
How do these filters make you feel about yourself and your appearance?
Do different filters make you feel differently?
How do you see the link between who you are in a real world and how you are represented when overlaid with AR filter?
Do you think the use of filters has a positive or negative influence on your everyday life? How?
Do you think the use of filters has a positive or negative influence on how you feel about yourself? How?

Appendix B - Survey details

Description of AR face filters as provided in the survey

"Augmented reality (AR) face filters visually change your appearance or your background and surrounding in real-time with virtual overlays, that contains imagery, information, and other visual effects. The visual overlays range from subtle to extreme. As opposed to photo editing, where photos are edited *after* they are taken, AR face filters *directly* visually change one's appearance *in real-time* while looking in the screen with camera view or when being recorded. There are different such filters that you can use on Instagram. See an image below with some examples."

Description of interactions with AR face filters as provided in the survey

"Please note that all the questions about the filters refer to your use of AR face filters on Instagram. Important: For the purpose of this survey, using the filters include all your active interactions with AR face filters - when you try out different filters on yourself, on other people, or/and posting the content for which you used such filters. Content with AR face filters is any visual material (videos, photos) for which you used AR face filters."

Appendix C - Demographics of survey's participants

	Frequency	Percentage
Gender		
Male	130	24.3%
Female	401	74.8%
Non-conforming	4	.7%
Prefer not to say	1	.2%
Age		
18-20	102	19.1%
21-23	99	18.5%
24-26	106	19.7%
27-29	104	19.4%
30-32	80	14.9%
33-35	45	8.4%

Education		
High School	163	30.4%
Professional Degree	37	6.9%
Undergraduate Degree	221	41.2%
Postgraduate Degree	95	17.7%
Doctoral Degree	12	2.2%
Other	8	1.5%
Employment		
Student	168	31.3%
Full-time employed	262	48.9%
Part-time employed	42	7.8%
Self-employed	18	3.4%
Unemployed	40	7.5%
Other	5	0.9%
Missing data	1	0.2%

Appendix D – Constructs' reliability, correlations and discriminant reliability

	α	CR	AVE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Creative content curation	0.90	0.93	0.77	**0.88**													
Convenience	0.75	0.89	0.80	0.21	**0.89**												
Filters' use	0.93	0.95	0.83	0.59	0.20	**0.91**											
Filters' exploration	0.77	0.87	0.69	0.40	0.31	0.51	**0.83**										
Hedonic Value	0.88	0.93	0.80	0.33	0.28	0.37	0.50	**0.90**									
Ideal Self Presentation	0.90	0.92	0.71	0.45	0.20	0.55	0.35	0.25	**0.84**								
Negative affect	0.86	0.91	0.71	0.18	0.00	0.18	0.01	-0.04	0.34	**0.84**							
Positive affect	0.84	0.89	0.68	0.50	0.32	0.48	0.45	0.43	0.29	0.10	**0.82**						
Affiliation	0.92	0.94	0.80	0.49	0.09	0.47	0.20	0.13	0.31	0.20	0.30	**0.89**					
Self-Acceptance	0.80	0.87	0.62	0.15	0.14	0.09	0.06	0.18	-0.09	-0.14	0.33	0.08	**0.79**				
Silliness	0.91	0.94	0.79	0.20	0.13	0.03	0.14	0.33	-0.14	-0.10	0.18	0.11	0.08	**0.89**			
Social Interaction	0.91	0.93	0.69	0.63	0.16	0.59	0.36	0.27	0.48	0.31	0.45	0.53	0.10	0.10	**0.83**		
Transformed Self Presentation	0.89	0.92	0.70	0.44	0.29	0.49	0.43	0.37	0.65	0.21	0.39	0.26	0.03	-0.01	0.41	**0.84**	
True Self Presentation	0.95	0.96	0.82	0.61	0.11	0.54	0.28	0.26	0.47	0.26	0.42	0.56	0.10	0.05	0.62	0.39	**0.91**

Constructs' reliability, composite reliability, average variance extracted, and constructs' correlations; bold in the diagonal is the square root of AVE