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Parasocial relationships and YouTube addiction: The role of viewer and YouTuber video characteristics

YouTube is a popular social media platform that fosters the development of social bonds between viewers and YouTubers called parasocial relationships (PSR). These relationships might be associated with both viewer characteristics, such as social anxiety, and YouTuber video characteristics, such as self-disclosure. Additionally, PSR might be associated with the level of addiction to the platform. Data from 370 college students were extracted from a previous study and 360 videos of 72 YouTubers were coded to (a) explore the different dimensions of PSR and (b) examine a mediation model of YouTube addiction. The results support the existence of three PSR dimensions. The results also showed that PSR dimensions were associated with both viewers' social anxiety and YouTubers' evaluative self-disclosure. One PSR dimension was positively associated with YouTube addiction. This study encourages the development of qualitative studies to more precisely identify the different facets of PSR with social media figures.

Key words: YouTube, YouTuber, parasocial relationship, self-disclosure, social anxiety, YouTube addiction

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With over 2 billion logged-in users every month and over a billion hours of video watched daily, YouTube is the most popular video-sharing platform (YouTube, 2020). Among the different social media sites, YouTube is known to have forged a celebrity culture of its own (Smith, 2014). YouTube's "broadcast yourself" ideology has encouraged the emergence of YouTubers, video bloggers who regularly upload videos on their personal YouTube channels (Jerslev, 2016). While consuming YouTubers' content, YouTube viewers establish social bonds with YouTubers that can be labelled as parasocial relationships (PSR).

Parasocial relationships are defined as asymmetrical relationships media users establish with media figures (Hartmann, 2016). The defining feature of these relationships is the lack of reciprocity or the inability to have access to the admired media figure. Recent research has explored PSR in social media environments and showed that these environments are conducive to the development of PSR (Bond, 2016; Rihl & Wegener, 2017; Stever & Lawson, 2013). However, social media platforms all have their own unique cultures and architectures (Khan, 2017; Smith et al., 2012). Users tend to interact with these platforms differently depending on their functionalities, which makes research focusing on specific platforms more relevant (Andreassen et al., 2016; Klobas et al., 2019).

Previous research showed that PSR are associated with both audience characteristics such as social anxiety, loneliness, or attachment styles, and content characteristics (Liebers & Schramm, 2019). Usually, PSR research focuses on either audience characteristics or content characteristics. The current study analyzed how both viewer characteristics and YouTuber video characteristics are associated with PSR. It was based on viewer data collected during a previous study (de Bérail et al., 2019) and on new data from YouTuber video coding. Both sets of data have been merged so that each participant was associated with data obtained through video coding corresponding to their favorite YouTuber. Both viewer characteristics (social anxiety, loneliness, and attachment styles) and YouTuber video characteristics (self-disclosure, level of fictional content, and level of physical presence) are defined and their relationships with PSR are discussed.

Recent studies have also explored how the development of PSR in the social media environment is linked to social media use and social media addiction. Parasocial relationships are known to play a role in media use (Giles, 2002; Hartmann, 2016; Klimmt et al., 2006; Liebers & Schramm, 2019; Tukachinsky & Stever, 2019) and are also associated with problematic social media use (de Bérail et al., 2019; Baek et al., 2013; Baek et al., 2014). The association between social media addiction and PSR is presented in our study based on a cognitive and behavioral framework of online addiction.

The general objective of the current study was to explore the dimensions and the determinants of PSR which YouTube viewers establish with YouTubers as well as the association between these PSR and the addictive use of the platform. In the first part of our literature review, we present the literature about PSR on social media. Afterwards, we present the literature supporting a definition of PSR as a

multidimensional construct, and we propose three distinct dimensions that might be important with regard to the specificities of YouTube: the desire to engage in parasocial processes, the feeling of intimacy, and the feeling of attraction. Next, we present the relevant literature and posit three hypotheses about the association between PSR and three characteristics common to viewers: social anxiety, attachment dimensions, and loneliness. In a subsequent section, we propose three other hypotheses about the association between PSR and three characteristics of YouTubers' videos: self-disclosure, level of fictional content, and level of physical presence. Finally, we present the literature about social media addiction and propose a cognitive and behavioral framework of online addiction applied to the YouTube environment. Next, the literature about the relationship between PSR with media figures and social media addiction is presented and hypotheses are formulated.

Parasocial Relationships on Social Media

Parasocial relationships refer to asymmetrical long-term relationships between media performers and their audiences (Liebers & Schramm, 2019). In the pre-Internet PSR research, PSR were related to media figures with whom one could not interact. Social media are different from pre-Internet media in that they allow users to easily interact with media figures. Although social media provide opportunities for actual reciprocal encounters with media figures, recent literature about parasocial phenomena agrees that social media are environments conducive to parasocial experiences (Hartmann, 2016; Hartmann, 2008; Rihl & Wegener, 2017; Stever & Lawson, 2013). Studying parasocial phenomena on Twitter, Stever and Lawson (2013) argued that, in spite of the occasional reply a fan might receive from celebrities, the relationships that users establish with celebrities are still parasocial. Furthermore, the fact that users may think it is easier to interact and get in contact with celebrities on social media is believed to intensify their PSR (Hartmann, 2016; Rihl & Wegener, 2017).

YouTube has also been identified as an environment conducive to the development of PSR (Chen, 2016; Ferchaud et al., 2018; Hartmann, 2016; Rihl & Wegener, 2017). We believe that YouTube, compared to other social media, is an environment especially conducive to the development of PSR because the architecture of this platform exacerbates the asymmetry between the audience and the media figures (the YouTubers).

Parasocial Relationship Dimensions

Parasocial Relationships as a Multidimensional Construct

Although PSR are usually operationalized under a single factor, the concept has also been theoretically characterized as a multidimensional phenomenon (Auter

& Palmgreen, 2000; Giles, 2002; Gleich, 1997; Klimmt et al., 2006; Sood & Rogers, 2000; Tsay & Bodine, 2012; Tukachinsky, 2010; Tukachinsky & Stever, 2019). Tsay and Bodine (2012) performed a principal component analysis (PCA) on an enriched version of the PSI-Scale and found four different dimensions of PSR established with media characters on TV labeled "guidance," "face-to-face desire," "intimacy," and "familiarity". Gleich (1997), who also studied PSR with TV personalities, performed a PCA on the 20-item version of the same scale and found three dimensions labeled "companionship," "person-program interaction," and "empathetic interaction."

There seems to be no consensus in previous studies regarding the different dimensions of PSR. This might be due to different theoretical frameworks and the fact that conceptualizations of PSR are bound to the media contexts in which they are studied (Klimmt et al., 2006). Taking into account the specificities of the YouTube environment, we believe that three dimensions might be expected regarding PSR with YouTubers. The ease of access and the large number of videos, the tendency of the YouTubers to promote intimacy with their audience, and their presence on other social media platforms and in real life events might contribute to a net increase in three distinct PSR dimensions: the desire to engage in parasocial processes, the feeling of intimacy, and the feeling of attraction.

The Desire for Parasocial Processes

Parasocial relationships are considered to be the result of successive media encounters with a mediated figure (Giles, 2002; Klimmt et al., 2006) during which the audience experiences parasocial processes. The term parasocial processes encompasses all of the psychological processes related to media characters, from simple automatic perceptions and categorizations of mediated characters to more elaborate and behavioral reactions (Hartmann, 2008; Klimmt et al., 2006). The nature of the audience's experience during media exposure generates specific kinds of anticipation regarding future PSR (Klimmt et al., 2006). Within this context, the desire for parasocial processes, which is associated with the positive anticipation of media encounters with a mediated figure, is likely to influence the utilization of a medium (Klimmt et al., 2006). The desire for parasocial processes appears to be a theoretically important PSR dimension, as it is a key incentive to deepening and prolonging the relation with a mediated figure. Indeed, the desire for parasocial processes leads to media consumption, which, in turn, develops the viewers' anticipations about the parasocial processes generated by the exposure to media figures. Ultimately, these anticipations strengthen the desire for parasocial processes with these media figures, which maintains the PSR.

Within the context of the social media environment, viewers' tendency to continue viewing content increases as they develop stronger PSR with media performers (Lim et al., 2020). The act of seeking repeated media exposure, which is motivated by the desire for parasocial processes, is an important part of PSR

development (Klimmt et al., 2006; Tukachinsky & Stever, 2019). Tukachinsky and Stever (2019) defined the development of parasocial experiences through five stages: initiation, experimentation, intensification, integration, and moving beyond PSR. During the first three stages, viewers seek more and more exposure to the media figure and progressively diversify the types of media used for this purpose. The last two stages lead to the desire to go beyond parasocial processes by meeting the media figure in person and having repeated reciprocal interpersonal interactions with them.

The viewers' desire for parasocial processes can be satisfied since YouTuber videos are plentiful and easily accessible. Thus, we believe the desire to engage in parasocial processes with YouTubers will be an important dimension of PSR with YouTubers. We formulated the following hypothesis:

H1a: The desire to engage in parasocial processes can be identified as a dimension of PSR with a favorite YouTuber.

The Feeling of Intimacy

Since the first definition of parasocial interaction (Horton & Wohl, 1956), the concept of intimacy has been a key element describing parasocial experiences. The bonds audience members establish with media figures are believed to create an illusion of intimacy. The intimacy with a media figure can be defined as the feeling of being close to this media figure. This feeling is formed through knowledge and experience of the media figure who is progressively considered as ever more familiar and friendly. Previous research exploring the dimensions of PSR supports the idea that the feeling of intimacy is an important dimension of PSR. It has previously been labelled as "companionship" (Gleich, 1997) or "intimacy" (Tsay & Bondine, 2012). Tukachinsky and Stever (2019) identified the feeling of intimacy with a media figure as part of the fourth stage of PSR development, which corresponds to an evolution of the sense of companionship during the third stage. Here, we chose to term this idea of closeness and proximity with a media figure as "feeling of intimacy."

Social media such as Twitter and YouTube are believed to foster intimacy between media figures and other users more than other types of media such as television (Hartmann, 2016). YouTubers are particularly known to encourage intimacy with their audience through self-presentation and self-disclosure (Aran-Ramspott et al., 2018; Berryman & Kavka, 2017; Ferchaud et al., 2018; Marôpo et al., 2020; Zappavigna, 2020). The vlog format made of tight face-to-face shots and direct addresses to the audience is also supposed to promote intimacy with viewers (Berryman & Kavka, 2017; Ferchaud et al., 2018; Zappavigna, 2020). Thus, the feeling of intimacy with YouTubers is expected to be a key dimension of PSR with YouTubers. We posited the following hypothesis:

H1b: The feeling of intimacy with a mediated figure can be identified as a dimension of PSR with a favorite YouTuber.

The Feeling of Attraction

Media figures attract audience members throughout the different stages of PSR development (Giles, 2002; Tukachinsky & Stever, 2019). At the early stages of PSR development, physical attractiveness of media figures is supposed to play an important role in attracting audience members (Tukachinsky & Stever, 2019). As PSR with media figures develop, audience members begin to increase their media use to experience parasocial encounters with these media figures. Then, the last stage of PSR development is believed to be an attempt to make contact with the admired media figure, crossing from parasocial to social relationships (Giles, 2002; Tukachinsky & Stever, 2019). Here, we use the term "feeling of attraction" to describe the fact that audience members feel attracted to media figures.

YouTubers are present on and attract their community on different platforms (Berryman & Kavka, 2017; Burgess & Green, 2018). As a result, audience members have multiple opportunities to interact with them and experience parasocial and even social encounters. YouTubers are also accessible in real life during conventions, for instance. Thus, we believe that the feeling of attraction will be an important dimension of PSR with YouTubers. We formulated the following hypothesis:

H1c: The feeling of attraction with a mediated figure can be identified as a dimension of PSR with a favorite YouTuber.

The Development of Parasocial Relationships: The Role of Viewers' Characteristics

Often compared to real-life relationships (Dibble et al., 2016), PSR are believed to satisfy individuals' need to belong, as social relationships do (Bond, 2018; Hartmann, 2016; Schramm & Hartmann, 2008). More precisely, the parasocial compensation hypothesis posits that individuals who feel lonely or who present social skill deficits, such as social anxiety or anxious attachment, tend to develop more PSR to fulfil their need to belong. Although results concerning the parasocial compensation hypothesis are mixed (Hartmann, 2016), PSR have been shown to be positively associated with variables like social anxiety, loneliness, or anxious attachment (Baek et al., 2013; Bond, 2018; Cohen, 2004; Cole & Leets, 1999; Greenwood & Long, 2009, 2011; Theran et al., 2010).

Social Anxiety

Social anxiety is defined as fear or anxiety in response to social interactions or performance situations that are either avoided or painfully and reluctantly endured (American Psychiatric Association, 2013). Socially anxious individuals are believed to prefer computer-mediated interactions because they offer them a feeling of comfort compared to real-life social interactions (Prizant-Passal et al., 2016).

Through PSR, socially anxious individuals are assumed to satisfy their relational needs without being exposed to the discomfort generated by real-life social encounters. Parasocial relationships with YouTubers, because of their structural asymmetry and asynchrony, appear, at least in theory, to be a safe and functional alternative that can satisfy the need of social relationships of socially anxious individuals (de Bérail et al., 2019). Thus, we posited the following hypothesis:

H2a: Viewers' social anxiety will be positively associated with the intensity of PSR dimensions with a favorite YouTuber.

Attachment Dimensions

Some viewers might tend to establish intense PSR as a function of a general inclination to seek closeness with others, as reflected in attachment dimensions (Tukachinsky & Stever, 2019). Bartholomew and Horowitz (1991) described four different attachment dimensions: secure, preoccupied, dismissive, and fearful. They also developed a two-dimensional model of attachment based on the continuous dimensions of anxiety and avoidance which allow for a more powerful and precise measurement of attachment dimensions than categorical measures (Bartholomew et al., 2016).

Highly anxious individuals are dependent on other people's acceptance and they experience fear of being abandoned or hurt. This dimension of attachment may indeed seem similar to social anxiety. However, whereas social anxiety essentially reflects the individual's discomfort in social situations, the anxiety dimension of attachment reflects the individual's desire to feel close to others despite feeling anxious. Based on the parasocial compensation hypothesis, such individuals will be logically attracted to PSR which represent safe alternatives for satisfying their social needs. Several studies have found results supporting the association between anxious attachment and PSR (Cohen, 2004; Cole & Leets, 1999; Theran et al., 2010; Tukachinsky & Stever, 2019). Highly avoidant individuals are not motivated to engage in close relationships and value independence and self-reliance. In such cases, contrary to anxious individuals, avoidant individuals should be less keen to develop PSR (Cole & Leets, 1999; Tukachinsky & Stever, 2019). Thus, YouTube viewers experiencing anxious attachment may be attracted to YouTubers as they represent a safe alternative to social relationships. Because of this, they may tend to develop more intense PSR than viewers experiencing avoidant attachment. The following hypothesis is then formulated:

H2b: Viewers' anxious attachment will be positively associated with the intensity of PSR dimensions with a favorite YouTuber while viewers' avoidant attachment will be negatively associated with the intensity of PSR dimensions with a favorite YouTuber.

Loneliness

The loneliness version of the parasocial compensation hypothesis posits that more lonely individuals should tend to develop more intense PSR. Although this version of the parasocial compensation hypothesis seems to offer particularly ambivalent and inconclusive findings (Hartmann, 2016, Liebers & Schramm, 2019), several studies indicated positive associations between parasocial phenomena and loneliness (Baek et al., 2013; Bond, 2018; Greenwood & Long, 2009). Loneliness is also often associated with Internet addiction (Moretta & Buodo, 2020). Lonely YouTube viewers might develop more intense PSR with YouTubers because these relationships might provide a feeling of social support which could reduce their feeling of loneliness. Given the available, although sometimes mixed, results of the literature regarding the association between audience characteristics and PSR with media figures, we proposed the following hypothesis:

H2c: Viewers' loneliness will be positively and significantly associated with the intensity of PSR dimensions with a favorite YouTuber.

Age

Parasocial phenomena exist and develop across the lifespan (Giles, 2002). Their intensity appears to be associated with the age of the audience (Liebers & Schramm, 2019). Parasocial relationships are considered as part of the normal course of adolescent and adult development (Theran et al., 2010; Stever, 2011). These relationships are believed to support individuals during transitional periods, such as the transition from parental attachment to peer attachment (Giles & Maltby, 2004). During these periods of transition, individuals look for models to emulate. Celebrities are role models for adolescents and young adults in the midst of identity crisis (Stever, 2011). As a result, adolescents show very strong PSR with celebrities (Maltby et al., 2005). It is expected that among young adults, the younger ones will be more confronted with the challenges of the transition period they are going through. Thus, we posited the following hypothesis:

H2d: Viewers' age is negatively and significantly associated with the intensity of PSR dimensions with a favorite YouTuber.

The Development of Parasocial Relationships: The Role of YouTubers' Video Characteristics

Alongside user characteristics, media figure characteristics are also known to impact the development of PSR (Liebers & Schramm, 2019). Several media performer characteristics are believed to influence PSR, such as the level of self-disclosure, the authenticity of the mediated figure, and the level of physical presence.

Self-Disclosure

The deepening of PSR is supposed to occur through self-disclosure (Hoffner, 2008), similarly to social relationships. The social penetration theory posits that social relationships develop through the reciprocal revelation of personal information (Altman & Taylor, 1973). However, due to its asymmetrical nature, the process of revealing personal information is not reciprocal in the case of PSR. YouTubers are known to maintain relationships with their viewers through self-presentation and self-disclosure (Chen, 2016; Ferchaud et al., 2018). The self-disclosure variables represent the content of the YouTubers' speech. YouTubers' language content and style have been studied previously (Aran-Ramspott et al., 2018; Cendekiaputri et al., 2021; Fägersten, 2017). Viewers have also been shown to know and imitate YouTubers' language and expressions (Aran-Ramspott et al., 2018). YouTubers also use specific language styles to emphasize essential points and create rhythm which increases viewers' engagement (Cendekiaputri et al., 2021). Self-disclosure describes the content of the language of an individual. When individuals are self-disclosing, their language is composed of facts about themselves or their own opinions or emotions. Recent studies have explored the association between self-disclosure and PSR with media figures on social media (Chung & Cho, 2017; Eyal et al. 2020; Kim & Kim, 2020; Kim & Song, 2016; Ledbetter & Redd, 2016). Some studies have found that perceived self-disclosure by celebrities on social media enhances PSR with them through a feeling of social presence (Kim & Song, 2016). Social media users' perception of self-disclosure by celebrities was also found to be positively associated with a sense of friendship with these celebrities (Kim & Kim, 2020). Moreover, Eyal et al. (2020) found that the lack of self-disclosure by media personalities on social media might hinder the development of PSR, as it may be associated with a lower impression of authenticity.

Two types of self-disclosure can be distinguished: factual and evaluative (Reis & Shaver, 1988). Factual self-disclosure refers to revealing descriptive personal information. Evaluative self-disclosure includes the revelation of personal thoughts and feelings. Although both types of self-disclosure reveal information about one's personal life, evaluative self-disclosure, because it involves emotions and feelings, is supposed to lie at the core of one's self-definition and thus might be more narrowly related to the feeling of closeness (Laurenceau et al., 1998; Reis & Shaver, 1988). Thus, we proposed the following hypothesis:

> H3a: YouTubers' self-disclosure will be positively associated with the intensity of PSR dimensions with a favorite YouTuber, and YouTubers' evaluative self-disclosure will be more closely associated with the intensity of PSR dimensions with a favorite YouTuber than factual self-disclosure.

Fictional Content

Many YouTubers play fictive roles in their videos. While some are objectively

acting in their videos, others present themselves as if their self-presentation in the video corresponded to their authentic self in their everyday life. A high level of fictional content reflects the fact that, for most of the duration of the video, the YouTuber explicitly plays a fictive role whereas a low level of fictional content reflects the fact that, during most of the video, the YouTuber seems to be authentic. The perceived authenticity of a media performer is believed to have an impact on PSR (Ferchaud et al., 2018; Giles, 2002; Hartmann, 2008). Thus, as YouTubers who play roles in their videos might be perceived as less authentic, the level of fictional content of YouTube videos might be associated with the intensity of PSR with YouTubers. We formulated the following hypothesis:

H3b: YouTubers' level of fictional content will be negatively associated with the intensity of PSR dimensions with a favorite YouTuber.

Physical Presence

A previous study has found that viewers who are directly addressed by a TV performer on a bodily level experience a more intense parasocial connection (Hartmann & Goldhoorn, 2011). Although some YouTubers are always physically present in their videos, others are not, and thus cannot address their viewers on a bodily level. In the current study, the degree of physical presence of a YouTuber was defined as the proportion of time a YouTuber is visible in their videos. A high level of physical presence reflects the fact that the YouTuber is almost always visible during the video, whereas a low level of physical presence reflects the fact the YouTuber appears rarely or does not appear at all during the video. When a YouTuber is present on screen, there is naturally more opportunity for nonverbal communication. Conversely, when a YouTuber has little or no on-screen presence, there is little or no nonverbal communication. Thus, the physical presence of a mediated figure could be associated with PSR. Other nonverbal communication variables could have been selected in the current study, such as the orientation of the YouTuber's gaze (straight towards the camera lens or not). However, it is much more time-consuming to code this type of variable than the simple presence of the YouTuber on screen, so this type of variable is probably more prone to coding errors. The level of physical presence has then been selected because it appears to be a relatively reliable variable for estimating the impact of nonverbal communication on PSR compared to other types of variables in this category, which may be more specific but also more prone to coding errors. As such, we posited the following hypothesis:

H3c: YouTubers' level of physical presence will be positively associated with the intensity of PSR dimensions with a favorite YouTuber.

Social Media Addiction

Alongside research about the influence of audience and media content's

characteristics on PSR, previous literature also focused on the theoretical association between media use and PSR (Giles, 2002; Klimmt et al., 2006). Recent research has underlined that PSR are positively associated with social media use and more specifically with social media addiction (Baek et al., 2013; de Bérail et al., 2019; Lim et al., 2020; Zsila et al., 2021).

Social Media Addiction: A Cognitive and Behavioral Approach

Social media addiction can be defined as an excessive preoccupation with social media which leads the individual to dedicate a lot of time and effort to social media. In turn, this can interfere with educational, work, or social functioning (Andreassen, 2015). Based on the cognitive and behavioral approach to pathological Internet use (Davis, 2001), addiction to social media is believed to be the result of maladaptive cognitions and external issues (Kuss & Griffiths, 2017). These maladaptive cognitions result in a combination of predisposed individual vulnerabilities, such as social anxiety and the user experience of online applications. Although social media addiction is positively associated with insecure attachment (anxious and avoidant, D'Arienzo et al., 2019) and with loneliness (Primack et al., 2017), social anxiety is known to be strongly related to the development of Internet addiction (Caplan, 2006; Prizant-Passal et al., 2016) and has already been identified as a key vulnerability to YouTube addiction (de Bérail et al., 2019). Therefore, we proposed the following hypothesis:

> H4a: viewer characteristics, especially social anxiety, will be associated with the viewer degree of YouTube addiction.

Additionally, the experience one has of online applications is believed to play a reinforcing role in the pathological use of online applications through the enjoyment they provide (Turel & Serenko, 2012). YouTube addiction is associated with the use of YouTube for entertainment and to pass the time (Balakrishnan & Griffiths, 2018; Klobas et al., 2019; Klobas et al., 2018), but it is also associated with PSR with YouTubers (de Bérail et al., 2019). Within a cognitive and behavioral framework, PSR with YouTubers can be considered as a reinforcement of YouTube addiction.

Social Media Addiction and Parasocial Relationships

Previous studies showed that PSR are positively associated with problematic internet use (Zsila et al., 2018) and problematic social media use (de Bérail et al., 2019; Baek et al., 2013; Zsila et al., 2021). Regarding PSR dimensions, the desire for parasocial processes theoretically influences the utilization of a medium (Klimmt et al., 2006) and should be particularly associated with problematic social media use. People anticipate that exposure to a media figure, which includes multiple parasocial processes, will be enjoyable. This positive anticipation is

supposed to foster media consumption (Klimmt et al., 2006). Thus, we formulated the following hypothesis:

H4b: PSR dimensions, especially the desire to engage in parasocial processes, will be positively associated with viewer degree of YouTube addiction.

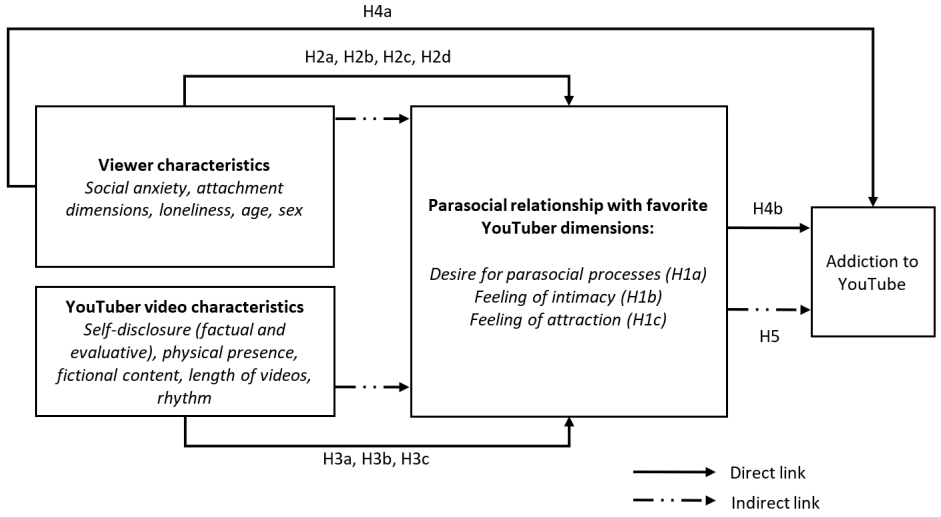
Both viewer and YouTuber video characteristics are expected to be associated with PSR dimensions (H2a, H2b, H2c, H2d, H3a, H3b, and H3c). Parasocial relationship dimensions, and especially the desire to engage in parasocial processes, are also believed to be associated with YouTube addiction (H4b). Thus, viewer and YouTuber video characteristics might be associated with YouTube addiction through the mediating role of PSR dimensions. Parasocial relationships with YouTubers can be considered a reinforcement of YouTube addiction within the cognitive and behavioral approach to pathological internet use applied to YouTube (de Bérail et al., 2019; Davis, 2001). Indeed, PSR could enhance the relationship between the viewer and YouTuber video characteristics, and YouTube addiction. In our previous study, we found that PSR with YouTubers partially mediated the relationship between viewers' levels of social anxiety and of YouTube addiction (de Bérail et al., 2019). Moreover, if a viewer has a strong desire to engage in parasocial processes with their favorite YouTuber, it could foster the development of YouTube addiction, since the use of this platform is the main way for the viewer to engage in parasocial processes with this media figure. Thus, we posited the following hypothesis:

H5: PSR dimensions, and especially the desire for parasocial processes, will mediate the effect of viewers' characteristics and YouTuber video characteristics on YouTube addiction.

The contribution of the current study was threefold. First, it complements viewer data from a previous study (de Bérail et al., 2019) with new data from YouTuber video coding. Second, it explores the concept of PSR as a multidimensional construct and proposes different dimensions to describe this phenomenon on YouTube. Third, a mediation model of YouTube addiction including both viewers' and YouTubers' video characteristics is tested.

Based on the different hypotheses and the literature, we proposed the model shown in Figure 1. In this model, not only viewer characteristics but also the YouTuber video characteristics are associated with the intensity of PSR with YouTubers. Viewer characteristics, such as social anxiety, have an impact on the development of PSR. We also suggest that YouTuber video characteristics, such as the degree of self-disclosure, would impact the development of PSR. By modulating their discourse, YouTubers could allow their viewers to establish more or less PSR with them. Thus, in our proposed model, the two categories of PSR determinants are viewer characteristics and the content of YouTuber videos. As developed earlier, we believe that PSR are a multidimensional construct and that three dimensions should be considered regarding PSR with YouTubers: desire for parasocial processes, feeling of intimacy, and feeling of attraction. Finally, this

Figure 1. *Model of Parasocial Relationship Dimensions and Addiction to YouTube*



model proposes to explain YouTube addiction by viewer characteristics and the intensity of PSR. Specifically, we suggest that, based on Davis's (2001) model of Internet addiction, PSR can be understood as reinforcing YouTube addiction, while viewer characteristics, such as social anxiety, may constitute a vulnerability.

Method

The current study used two different datasets. The first dataset consisted of viewer data. It was extracted from a database of a previous study (de Bérail et al., 2019). Data were collected online using LimeSurvey, and participants were recruited from different Facebook groups, especially student groups. Student Facebook groups bring together students from the same city or university.

The second dataset was new and it consisted of YouTuber video characteristics obtained through video coding. The previous study (de Bérail et al., 2019) included participants from different countries. In order to simplify the video coding, by French coders, only data from participants recruited in French student Facebook groups have been extracted for the current study. Complete data are available for 600 viewers who named 302 different favorite YouTubers. To keep the number of coded videos within a reasonable limit, only data from the respondents who named a YouTuber cited by at least one other participant as a favorite YouTuber were retained. Data from a total of 370 viewers who named 72 different YouTubers were retained for data analysis. Table 1 presents all the viewers' variables. The names of the 72 different YouTubers are provided in the Appendix (see Table A1).

YouTuber video characteristics were measured through video coding. Table A2 in the Appendix presents all the YouTuber video characteristics. For each of the 72 YouTubers cited, five videos were coded. The five last videos of each YouTuber uploaded before February 1st 2018 were selected, as these videos were the last videos uploaded before the time of the study. The last five uploaded videos were selected as they were assumed to be the most representative of the nature of the YouTuber's current content at the time of the study. The number of videos coded per YouTuber was limited to five in order to keep the video coding process feasible. Video coding was thus undertaken for 360 videos (approximately 90 hours of video content). A codebook was specifically designed for this study to measure YouTuber video characteristics. In order to test intercoder reliability, a sample of at least 50 units, or 10% of the full sample, was considered as appropriate (Lombard et al., 2002). Two independent coders then coded 50 randomly selected videos. Intercoder reliability was tested using Krippendorff's α for ordinal variables and ranged from 0.82 to 0.91, which is acceptable (Lombard et al., 2002). Krippendorff's α for all the coded variables are presented in the Appendix (Table A2). In order to merge the two datasets, each participant was assigned a score for each YouTuber video characteristic that corresponded to the score obtained through video coding of their favorite YouTubers' videos.

Measures

Viewer Variables

Viewer characteristics were evaluated through an online survey. Six viewer characteristics were measured: YouTube addiction, PSR intensity, social anxiety,

Table 1. List of the Viewer Characteristics

Viewers variables	Scales	References	Items	Scoring system
YouTube addiction	IAT	Khazaal et al., 2008; Young, 1998	20	6-point scale
Social anxiety	LSAS-SR	Fresco et al., 2001; Liebowitz, 1987; Yao et al., 1998	24	4-point scale
Parasocial relationship intensity	PSI-Scale	Rubin & Perse, 1987; Rubin et al., 1985	10	5-point scale
Anxiety (attachment dimension)	Relationship Questionnaire	Bartholomew & Horowitz, 1991	4	7-point scale
Avoidance (attachment dimension)	Relationship Questionnaire	Bartholomew & Horowitz, 1991	4	7-point scale
Loneliness	UCLA Loneliness Scale	De Grace, Joshi & Pelletier, 1993; Hughes et al., 2004; Russell, 1996	3	4-point scale
Age	-		-	Years
Sex	-		-	Male: 1

anxious attachment, avoidant attachment, and loneliness. Control variables included age and sex. Sex was dummy-coded as 0 for female and 1 for male.

YouTube addiction. The level of YouTube addiction was assessed using a 20-item YouTube-adapted version of the Internet Addiction Test (IAT, Khazaal et al., 2008; Young, 1998). The IAT defines Internet addiction as an excessive and uncontrollable Internet use that leads to problematic behavior and impairments in daily functioning. Items were adapted in order to fit the context of YouTube use (e.g., "How often do you try to hide how long you've been on YouTube?"). The IAT is considered to be one of the most validated and most frequently used instruments to measure Internet addiction (Laconi et al., 2014). Each item is rated on a 5-point Likert scale ranging from 1 (*rarely*) to 5 (*always*) with a nonapplicable option (0). Cronbach's $\alpha = .88$. All items are added up to create the total score, which ranges from 0 to 100. Higher scores indicate higher degrees of addiction.

Social anxiety. Social anxiety severity was assessed using the self-report version of the Liebowitz Social Anxiety Scale (LSAS-SR, Fresco et al., 2001; Liebowitz, 1987; Yao et al., 1998). The scale measures fear and avoidance of respondents in regard to 24 different social situations (e.g., "Talking to people in authority"). Respondents rate each situation according to their levels of fear and avoidance on a 4-point Likert scale ranging from 0 (*none and never, respectively*) to 3 (*severe* and *usually*, respectively). Cronbach's $\alpha = .95$. The total score ranges from 0 to 144. Higher scores indicate higher levels of social anxiety. The LSAS-SR has been proven to have good psychometric properties (Fresco et al., 2001; Oakman et al., 2003).

Attachment dimensions. Attachment dimensions were evaluated using the Relationship Questionnaire (Bartholomew & Horowitz, 1991). The questionnaire consists of four paragraphs describing four different attachment dimensions (secure, preoccupied, dismissive, and fearful). Respondents rate each paragraph on a 7-point scale ranging from 1 (*not at all like me*) to 7 (*very much like me*). Two attachment dimensions (avoidant and anxious) are calculated from the participants' answers (Griffin & Bartholomew, 1994). The avoidant attachment score is calculated by adding the ratings of the fearful and dismissive paragraphs and by subtracting the ratings of the preoccupied and secure paragraphs. The anxious attachment score is calculated by adding together the ratings of the fearful and preoccupied paragraphs and by subtracting the ratings of the dismissive and secure paragraphs. The Relationship Questionnaire has good reliability and satisfactory discriminant and face validity (Ravitz et al., 2010).

Loneliness. The shortened 3-item version of the University of California Los Angeles (UCLA) Loneliness Scale was used to assess loneliness (De Grace et al., 1993; Hughes et al., 2004; Russell, 1996). Respondents rate the three items on a 4-point Likert scale ranging from 1 (*never*) to 4 (*always*). Cronbach's $\alpha = .80$. Total scores range from 3 to 12. This scale is an internal and subjective measure of loneliness. Higher scores indicate greater degrees of perceived loneliness. The short version of the UCLA Loneliness Scale has demonstrated good internal

consistency (Hughes et al., 2004; Matthews-Ewald & Zullig, 2013).

Parasocial relationship dimensions. The 10-item version of the Parasocial Interaction- Scale (PSI-Scale) was used to measure the intensity of the PSR with the favorite YouTuber (Rubin & Perse, 1987; Rubin et al., 1985). Parasocial relationships and parasocial interactions (PSI) are two distinct concepts describing parasocial phenomena (Liebers & Schramm, 2019): PSI are asymmetrical interactions between the audience and media characters that occur in a media exposure situation (Dibble et al., 2016; Hartmann, 2008; Liebers & Schramm, 2019). While PSI only take place during media reception, PSR refer to long-term relationships which extend beyond media exposure (Liebers & Schramm, 2019). When the concept of PSI was first defined, authors had already been referring to these long-term relationships using the term "PSI" for quite a while, which led to conceptual confusion (Dibble et al., 2016). As a result of this confusion, the PSI-Scale (Rubin & Perse, 1987; Rubin, Perse & Powell, 1985), despite its name, in fact measures long-term relationships with a mediated figure, that is to say, PSR, rather than PSI (Dibble et al., 2016).

We adapted the scale to the context of YouTube (e.g., "I look forward to watching my favorite YouTuber on his or her next video"). Items are rated on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Cronbach's $\alpha = .73$. A PCA with promax rotation was performed to explore the existence of different PSR dimensions. The following criteria were used to evaluate the PCA: eigenvalue > 1.0, variance explained by each component and loading score for each factor > |0.40|, and meaningfulness of each dimension. We deleted one item with a loading lesser than 0.30. The PCA was rerun with the remaining nine items. Factor loadings are presented in Table 2. The Kaiser-Meyer-Olkin (KMO) criterion value verified sampling adequacy. The KMO values above 0.50 are considered as acceptable (Williams et al., 2010). The individual KMO value ranged from 0.69 to 0.80 and the overall KMO value was 0.76. A meaningful and interpretable three-component solution was obtained. The first component included three items that describe the viewer's desire to watch the YouTuber. This dimension was thus named "desire to engage in parasocial processes" since watching YouTubers can be considered to be an exposure to mediated characters that automatically triggers parasocial processes (H1a). The second component included three items related to the way the YouTuber is perceived: as a friend, as natural, as understanding what the viewer wants to know. We thus labeled this dimension "feeling of intimacy" with the YouTuber (H1b). The third component, forming the "feeling of attraction" with the YouTuber (H1c), contained three items referring to (a) the desire to meet the YouTuber in real-life, (b) the desire to learn new information about the YouTuber through magazines and newspapers, and (c) how attractive they are felt to be. Although these dimensions have rather low Cronbach's α coefficients, coefficients greater than .40 are considered acceptable for research purposes when samples are larger than 100 (Milfont & Gouveia, 2006; Mueller, 1986). Morever, average interitem correlations for

these dimensions ranged from 0.24 to 0.38 and indicated acceptable internal consistency (Clark & Watson, 1995; see Table 2).

YouTubers Variables

The five videos selected for each YouTuber were coded based on the codebook specifically designed for the study. YouTubers' self-disclosure variables, the level of videos' fictional content, and YouTubers' level of physical presence were assessed. Each variable was evaluated on a 4-point Likert-type scale ranging from 0 (*absence of the variable*) to 3 (*strong presence of the variable*). For each of the four variables, the scores obtained for the five selected videos were added together to create an overall score ranging from 0 to 15. Two types of self-disclosure were evaluated: factual self-disclosure (e.g., "I am 30 years old" or "I went to Italy," Krippendorff's $\alpha = 0.82$) and evaluative self-disclosure (e.g., "I like skiing" or "I feel sad," Krippendorff's $\alpha = 0.91$). Higher scores in factual self-disclosure indicate greater amount of factual self-disclosure in the videos. Higher scores in evaluative self-disclosure indicate greater amount of evaluative self-disclosure in the videos. Fictional content was defined as any moment

Table 2. Dimensions of Parasocial Relationships

Items	Components			Cronbach's α	Mean interitem correlation
	1	2	3		
Desire to engage in parasocial processes (explained variance: 21.61%)				.64	0.38
I look forward to watching my favorite YouTuber on his or her next video	0.64	0.04	-0.21		
If my favorite YouTuber appeared in a video on another YouTube channel, I would watch that video	0.53	-0.00	-0.08		
I miss seeing my favorite YouTuber when he or she is ill or on vacation	0.46	-0.07	0.11		
Feeling of intimacy (explained variance: 16.91%)				.55	0.29
My favorite YouTuber makes me feel comfortable, as if I am with a friend	0.14	0.53	0.03		
I see my favorite YouTuber as a natural, down-to-earth person	-0.08	0.66	-0.02		
My favorite YouTuber seems to understand the kinds of things I want to know	0.02	0.53	0.07		
Feeling of attraction (explained variance: 15.79%)				.48	0.24
If I saw a story about my favorite YouTuber in a newspaper or magazine, I would read it	0.08	-0.05	0.44		
I would like to meet my favorite YouTuber in person	0.18	-0.03	0.48		
I find my favorite YouTuber to be attractive	-0.24	0.05	0.73		
Total of explained variance: 54.31%					

Note. Factor loadings based on a PCA with promax rotation.

within a video in which the YouTuber played a fictional role, for example, in a humorous sketch (Krippendorff's $\alpha = 0.91$). Higher scores in fictional content indicate greater amount of fictional content in the videos. The physical presence variable was defined as any moment within a video where it was possible to see and recognize the body of the YouTuber (Krippendorff's $\alpha = 0.86$). For instance, YouTubers are considered physically present when their face or body is present on screen, whereas YouTubers are considered as not physically present when their body is not present on screen or when only their virtual avatar is present on screen. Higher scores in physical presence indicate greater amount of screen time of the YouTuber in their videos. Control variables included average length of the videos in seconds and average frequency of publication in days.

Data Analysis

The data were analyzed using STATA® (version 14.2) for Windows. Structural equation modeling (SEM) using the maximum likelihood method was used to explore the direct effects (H2a, H2b, H2c, H2d, H3a, H3b, H3c, H4a, and H4b) and the mediating role of PSR dimensions (H5). Structural equation modeling is a multivariate technique recommended in mediation analysis (Iacobucci, 2008; Zhao et al., 2010). The Monte Carlo approach was used to estimate indirect effects, as recommended for mediation analyses (Jose, 2013). The goodness of fit was checked based on the following criteria: χ^2/df lesser than 5 (Hooper et al., 2008), the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR) lower or equal to 0.08 (Garver & Mentzer, 1999; Hooper et al., 2008), and the comparative fit index (CFI) higher or equal to 0.90 (Garver & Mentzer, 1999). Four and five parcels have been created for two latent variables, YouTube addiction and social anxiety, respectively, following the recommendations in the literature (Little et al., 2002; Matsunaga, 2008). The items of the UCLA Loneliness Scale and of the PSI-Scale served directly as indicators for the latent variables loneliness and PSR dimensions. All the other variables were considered to be variables observed within the analyses.

Results

Descriptive Statistics

Table 3 displays the means, SDs, and correlations for all variables. The final sample consisted of 370 participants, including 78 (21.1%) males. The mean age of respondents was 19.62 years ($SD = 1.65$). The average length of the videos was 781.29 seconds ($SD = 412.33$) and the average number of days between two video publications was 10.13 days ($SD = 15.42$).

Table 3. Means, SDs, and Correlations for All Study Variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. YouTube addiction	1.00															
2. Desire to engage in parasocial processes	0.41***	1.00														
3. Feeling of intimacy	0.20***	0.36***	1.00													
4. Feeling of attraction	0.14**	0.36***	0.33***	1.00												
5. Age	−0.07	-0.13*	−0.17**	−0.18***	1.00											
6. Sex (male = 1)	0.02	0.06	−0.06	−0.03	0.06	1.00										
7. Social anxiety	0.36***	0.22***	0.18***	0.10	−0.03	−0.20***	1.00									
8. Loneliness	0.23***	0.11*	0.09	0.14**	−0.11*	−0.16**	0.43**	1.00								
9. Anxiety (attachment dimension)	0.18***	0.12*	0.04	0.15**	−0.09	−0.15**	0.38***	0.43***	1.00							
10. Avoidance (attachment dimension)	0.11*	−0.04	−0.05	−0.16**	0.05	−0.03	0.10	0.04	−0.05	1.00						
11. Factual self-disclosure	−0.02	−0.04	0.09	0.02	−0.14**	−0.17**	0.00	−0.03	−0.00	−0.04	1.00					
12. Evaluative self-disclosure	−0.00	−0.08	0.17**	−0.04	−0.00	−0.09	0.04	−0.02	−0.05	0.10*	0.43***	1.00				
13. Level of fictional content	−0.03	0.01	−0.16**	−0.06	0.03	0.11*	−0.10*	−0.06	0.01	−0.07	−0.48***	−0.36***	1.00			
14. Level of physical presence	−0.11*	−0.13*	0.04	0.01	−0.08	−0.30***	−0.02	−0.06	−0.02	−0.05	0.23***	0.15**	0.14**	1.00		
15. Average length of the videos	0.19***	0.18***	−0.02	−0.03	0.03	0.19***	0.07	0.04	0.03	0.10	−0.12*	0.08	−0.24***	−0.45***	1.00	
16. Average rhythm of publication	0.01	−0.00	−0.02	−0.01	0.00	0.16**	−0.05	−0.02	0.03	−0.02	0.16**	0.05	0.42***	-0.00	−0.10	1.00
M	19.03	10.05	11.24	9.66	19.62	-	53.28	7.07	−0.33	0.45	5.41	7.95	3.01	12.51	781.29	10.13
SD	10.11	2.17	1.96	2.29	1.65	-	24.08	2.39	4.60	4.22	3.92	3.61	3.99	3.87	412.33	15.42

Note. $*p < .05$; $**p < .01$; $***p < .001$.

Structural Equation Modeling

A confirmatory factor analysis was conducted to assess the fit of the measurement model. The overall fit of the measurement model was good, df = 174; χ^2/df = 1.474; RMSEA = 0.036; CFI = 0.977; SRMR= 0.042. The fit of the structural model was good as well, df = 324; χ^2/df = 1.674; RMSEA = 0.043; CFI = 0.943; SRMR = 0.040. The results for the direct effects of the SEM are presented in Table 4.

Viewers' Characteristics on Parasocial Dimensions

The direct effects of social anxiety on the desire to engage in parasocial processes (β = 0.29, $p < .001$) and on the feeling of intimacy (β = 0.25, $p = .002$) were positive and statistically significant, which was consistent with H2a. Although the direct effects of the anxiety dimension of attachment on PSR dimensions are not significant, the direct effect of the avoidant dimension of attachment on the feeling of attraction is negative and significant (β = −0.20, $p = .002$), which is partially in line with H2b. The direct effects of loneliness on PSR dimensions are not significant, which is not consistent with H2c. The direct effects of age on the desire to engage in parasocial processes (β = −0.17, $p = .006$), the feeling of intimacy (β = −0.23, $p < .001$) and the feeling of attraction (β = −0.23, $p < .001$) are negative and significant, which is consistent with H2d.

YouTubers' Video Characteristics on Parasocial Dimensions

The direct effect of YouTubers' evaluative self-disclosure on the feeling of intimacy was positive and statistically significant (β = 0.18 $p = .023$). Thus, one PSR dimension appeared to be associated with YouTubers' evaluative self-disclosure, which was consistent with H3a. The direct effects of the level of fictional content and of the level of physical presence on PSR dimensions were not significant, which was not in line with H3b and H3c.

YouTube Addiction

Only social anxiety (β = 0.18, $p = .013$) and the desire to engage in parasocial processes (β = 0.67, $p < .001$) have positive significant direct effects on YouTube addiction, whereas the feeling of attraction has a negative direct effect on YouTube addiction (β = −0.26, $p = .041$). Thus, H4a and H4b were supported.

The indirect effects of viewer characteristics and YouTuber video characteristics' on YouTube addiction through the three different PSR dimensions were tested with a Monte Carlo approach. The indirect effects of social anxiety (β = 0.20, $p = .004$), age (β = −0.11, $p = .034$) and the average length of the videos (β = 0.13, $p = .026$) through the desire to engage in parasocial processes

were statistically significant and described a complementary mediation and two mediations which were only indirect, respectively. Thus, only one PSR dimension mediated the effect of two viewers' variables and one YouTubers' video variable on YouTube addiction, which was consistent with H5. Figure 2 shows the relationships between the variables connected with at least one statistically significant path for the clarity of the presentation.

Discussion

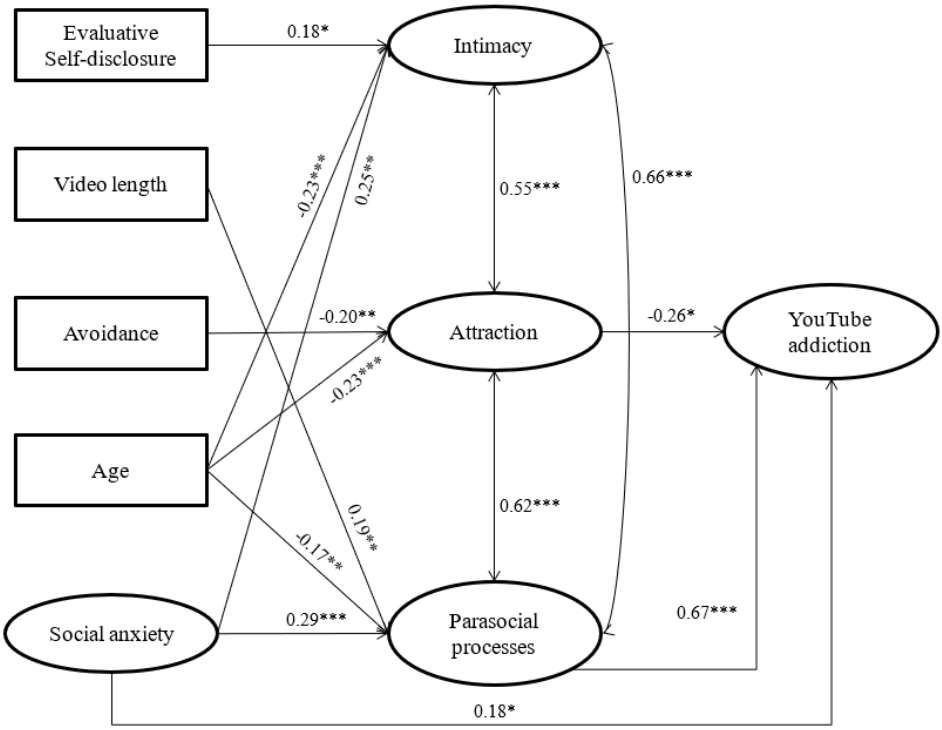
The aim of the current study was to explore the dimensions and determinants of PSR that YouTube viewers establish with YouTubers as well as the association between these PSR dimensions and the addictive use of the platform. By doing so, we believe our study provides three main contributions to the existing literature. First, our findings contribute to the parasocial phenomena literature by supporting the idea that PSR can be defined as a multidimensional construct and by supporting the social skill deficit version of the parasocial compensation hypothesis. Second, by combining viewer data and YouTuber video data, our

Table 2. Dimensions of Parasocial Relationships

	Desire to engage in parasocial processes		Feeling of intimacy		Feeling of attraction		YouTube addiction	
	β	p	β	p	β	p	β	p
Viewer variables								
Age	−0.17**	.006	−0.23***	< .001	−0.23***	< .001	−0.02	.655
Sex	0.08	.263	0.02	.734	0.13	.072	0.06	.315
Social anxiety	0.29***	< .001	0.25**	.002	0.04	.605	0.18*	.013
Loneliness	-0.01	.907	0.03	.723	0.11	.182	0.14	.056
Anxiety (attachment)	0.02	.770	−0.06	.463	0.12	.115	0.01	.857
Avoidance (attachment)	-0.06	.336	−0.09	.187	−0.20**	.002	0.07	.233
YouTube' variables								
Factual self-disclosure	0.06	.474	-0.10	.253	−0.05	.564	0.00	.947
Evaluative self-disclosure	−0.09	.228	0.18*	.023	0.04	.577	0.04	.549
Level of fictional content	0.11	.193	−0.17	.061	−0.04	.623	−0.03	.693
Level of physical presence	−0.10	.186	0.02	.791	−0.03	.683	0.02	.782
Average length of videos	0.19**	.007	−0.10	.211	−0.04	.569	0.03	.652
Average rhythm of publication	−0.00	.955	0.01	.866	0.06	.420	0.03	.620
PSR dimensions								
Desire to engage in parasocial processes							0.67***	< .001
Feeling of intimacy							−0.04	.764
Feeling of attraction							−0.26*	.041

Note. β = standardized coefficient.
*$p < .05$; **$p < .01$; ***$p < .001$.

Figure 2. *Diagram of Significant Standardized Path Coefficients*



Note. Ovals represent latent constructs, squares represent observed variables. For clarity, only significant standardized path coefficients are reported in the figure. All the path coefficients are reported in Table 4. Model fit: df = 324; χ^2/df = 1.674; RMSEA = 0.043; CFI = 0.943; SRMR = 0.040. *p < .05; **p < .01; ***p < .001.

study compares the magnitude of the association of these two types of data with PSR dimensions and YouTube addiction. Third, based on a cognitive and behavioral framework of online addiction (Davis, 2001), the current study also proposes a model of YouTube addiction in which each PSR dimension plays a different role, which furthermore underlines the necessity to treat PSR as a multidimensional construct. All these results also extend the findings of our previous study (de Bérail et al., 2019).

Theoretical Implications

Our current findings contribute to the PSR literature by defining PSR with YouTubers as a multidimensional construct with three dimensions: the desire to engage in parasocial processes, the feeling of intimacy, and the feeling of attraction. Our findings also support the idea that PSR can be defined as a

multidimensional construct (Auter & Palmgreen, 2000; Gleich, 1997; Sood & Rogers, 2000; Tsay & Bodine, 2012; Tukachinsky, 2010) and that the nature of PSR depends on the social media environment in which such PSR develop (Klimmt et al., 2006; Rihl & Wegener, 2017).

Regarding the association between viewer characteristics and these three PSR dimensions, our findings show that viewer social anxiety was positively associated with the desire to engage in parasocial processes and with the feeling of intimacy with the favorite YouTuber. These results are consistent with the skill deficit version of the parasocial compensation hypothesis (Hartmann, 2016). Additionally, individuals with high avoidant attachment scores tend to report less intense feelings of attraction toward their favorite YouTuber, which was consistent with previous studies showing that individuals with avoidant attachment dimensions report the weakest PSR (Cohen, 2004; Cole & Leets, 1999). On the one hand, socially anxious individuals develop more intense PSR to satisfy their need to belong by engaging in parasocial processes with their favorite YouTuber and through the establishment of an intimate feeling with them. On the other hand, individuals with low avoidant attachment scores probably do not completely fulfil their need to belong solely through means of parasocial processes provided by YouTube and so they desire to expand their connection with their favorite YouTuber through other means, such as real social interactions for instance.

Additionally, the viewers' age was negatively associated with all PSR dimensions, which was consistent with previous research on PSR with YouTubers (de Bérail et al., 2019; Rihl & Wegener, 2017). The younger the viewers, the more intense their PSR with their favorite YouTubers. The participants in the current study were mainly young adults around 20 years old (Mage = 19.62). The period from 18 to 29 years of age, referred to as "emerging adulthood," has been identified as one during which most identity explorations take place (Arnett, 2014). Young adults rely on the attachment to celebrities to cope with the challenges of their transition period (Stever, 2011). They are also known to make extensive use of social media, and YouTube in particular (Pew Research Center, 2021). Young adults may conduct their quest for identity on social media, establishing parasocial relationships with celebrities, including YouTubers, to support them in their transition period. Younger viewers in this age group might tend to deal with these issues more intensely, which may explain the fact that they also develop more intense parasocial relationships with YouTubers.

The results of our previous research (de Bérail et al., 2019) show that while viewer social anxiety and age are positively associated with PSR with YouTubers, viewer avoidant attachment is negatively associated with PSR. Thus, our current findings show that these results are robust even when YouTuber video characteristics are taken into account.

Regarding the association between YouTuber video characteristics and PSR dimensions, evaluative self-disclosure was positively associated with the viewer

feelings of intimacy. The more a YouTuber self-discloses personal thoughts or feelings, the more the viewers develop a feeling of intimacy toward them. The disclosure of personal information on social media is known to encourage PSR with media figures (Bond, 2016). Self-disclosure is present across top YouTube videos and seems to be key to developing PSR (Ferchaud et al., 2018). Our results specifically show that the most intimate type of self-disclosure, evaluative self-disclosure (Reis & Shaver, 1988), was positively associated with the feeling of intimacy with a YouTuber. This result is in line with the social penetration theory applied to PSR (Hoffner, 2008) and is consistent with previous studies (Ferchaud et al., 2018; Bond, 2016). Previous studies also showed that the type of language adopted by YouTubers, such as the use of swear words, can have an influence on the social distance and intimacy perceived by viewers (Fägersten, 2017). The results of the current study showed that when YouTubers use self-disclosure in their discourse, viewers experience a more intense feeling of intimacy toward them. Therefore, the choice of their words and the nature of the information they communicate have an impact on the type of relationship their viewers will develop with them. Further studies, beyond language content, should investigate the association between language styles and PSR with YouTubers.

Additionally, YouTubers' factual self-disclosure, the level of fictional content of videos, and YouTubers' physical presence were not associated with PSR dimensions. In the current study, YouTubers' video characteristics appeared less associated with PSR with YouTubers than the viewers' own characteristics were. Only evaluative self-disclosure was positively associated with one PSR dimension, while viewers' social anxiety was associated with two PSR dimensions, and avoidant attachment was associated with one.

Regarding YouTube addiction, both viewer social anxiety and the desire to engage in parasocial processes with one's favorite YouTuber were positively associated with YouTube addiction. The desire to engage in parasocial processes with the favorite YouTuber also mediated the relationship between viewer social anxiety and YouTube addiction. These results are in line with previous studies reporting an association between PSR and social media addiction (Baek et al., 2013, 2014), and between social anxiety and online addiction (Prizant-Passal et al., 2016). In a previous study, we found that PSR and viewer social anxiety were positively associated with YouTube addiction and that PSR mediated this relationship (de Bérail et al., 2019). Our current results are thus consistent with these previous results.

Our current results also show that the PSR dimension of the feeling of attraction was negatively associated with YouTube addiction. Thus, all PSR dimensions are not associated in the same way with YouTube addiction, which further underlines the need to treat PSR as a multidimensional construct. The fact that two PSR dimensions, the desire to engage in parasocial processes and the feeling of attraction, were associated in different ways with YouTube addiction can be explained theoretically. To satisfy the desire to engage in parasocial processes

with YouTubers, viewers need to use YouTube, which can explain why this dimension is positively associated with YouTube addiction. On the other hand, the feeling of attraction represents the fact that viewers feel attracted to their favorite YouTuber beyond their activity on YouTube and then tend to seek parasocial and social encounters through other media and in real-life, a fact which could explain why this dimension was negatively associated with YouTube addiction.

Based on the current results, it is possible to propose different profiles of PSR with YouTubers based on the PSR dimensions. Each of these profiles would be more or less associated with YouTube addiction. According to the results, viewers with a PSR profile that is more oriented towards the desire for parasocial processes would be more vulnerable to YouTube addiction. Indeed, when an activity is involved in satisfying an individual's desire, it is more likely to be associated with addictive behavior (Griffiths, 1997). The desire for parasocial processes reflects a desire for parasocial interaction that requires the use of a medium, in this case YouTube. YouTube is the main means of fulfilling this desire, which makes it a potential object of addiction. The greater the desire, the greater the risk of addiction to that which satisfies the desire. Therefore, the development of a desire for parasocial processes could theoretically be at the genesis of YouTube addiction. In parallel, it seems that viewers who report a high desire for parasocial processes also tend to report a high level of social anxiety and a rather young age. In addition, the lower the sense of attraction to a YouTuber, the higher the level of addiction. Indeed, the feeling of attraction here describes in particular the desire to extend the relationship with the YouTuber beyond the medium of YouTube. Thus, the more important this dimension is, the less YouTube would be perceived as the main means of nourishing the relationship established with the YouTuber, which would make the individual less prone to addictive behavior in the context of YouTube. It would appear that the viewers who report the lowest level of attraction are the viewers who report high avoidant attachment. The last identified PSR dimension, sense of intimacy, does not appear to be associated with YouTube addiction.

Finally, taking into account the viewer characteristics, the profile of viewers who would be most vulnerable to YouTube addiction would be young individuals with both high social anxiety and high avoidance. Regardless of their level of intimacy with their favorite YouTuber, these individuals would theoretically tend to have a high desire for parasocial processes and a low sense of attraction to YouTubers, which would constitute a high vulnerability to the development of YouTube addiction.

In order to confirm these interpretations of viewer profiles, more studies are needed that specifically seek to describe viewer profiles regarding YouTube addiction vulnerabilities. The results of this study are, above all, an encouragement for further studies in this direction.

Thus, our current study contributes to the literature concerning Internet addiction and PSR by underlining that the desire to engage in parasocial processes with YouTubers is the main PSR dimension associated with YouTube addiction,

which is theoretically consistent with the role of this desire in the decision process of media utilization (Klimmt et al., 2006).

Practical Implications

YouTubers, as well as other social media influencers, are known to be able to foster consumption behaviors (Munnukka et al., 2019; Sokolova & Kefi, 2020), but also health behaviors (Brown & Basil, 2010; Sakib, 2020), among their audience through PSR. Internet, and more specifically social media sites, are considered to be useful tools for health education purposes (Bliss et al., 2018), especially among teenagers (Plaisime et al., 2020). In the United States, YouTube is the most frequently used social medium among teenagers between 13 and 17 (Anderson & Jiang, 2018). For this reason, YouTubers could promote positive social or health behaviors among adolescents and prevention campaigns targeting this particular audience could rely on these media figures. As socially anxious individuals appear to report more intense parasocial relationships with YouTubers and are also specifically vulnerable to other disorders such as depression, drug abuse (Buckner et al., 2008; Lecrubier et al., 2000), Internet addiction (Prizant-Passal et al., 2016), or smartphone addiction (Enez Darcin et al., 2016), designing prevention campaigns relying on YouTubers could be very efficient.

Limitations and Future Directions

Our study is not without limitations. First, the cross-sectional design limits the inference of causal effects and, therefore, longitudinal designs in future studies should be encouraged. Second, self-report questionnaires of attachment are criticized for being passive and for not being able to detect situations where defenses distort responses (Ravitz et al., 2010). However, the use of these self-report measures is common practice, and much research has demonstrated their utility in testing and confirming fundamental predictions about attachment theory (Ravitz et al., 2010). Third, only six variables of viewer characteristics and six variables of YouTuber videos were selected for this study. Other variables could have been selected, however, it was chosen to limit their number so as not to overload the model. Fourth, our sample had an uneven distribution of men (21.1%) and women (78.9%). However, this common in this kind of research. Fourth, the participants were students, and future studies on the general population are needed to better analyse the development of PSR with YouTubers and the impact of PSR on YouTube addiction.

Future studies should analyse how effectively can YouTubers promote health behaviors among their audience and also explore which dimensions of PSR with YouTubers could influence viewers' behaviors. Furthermore, more qualitative studies exploring the different dimensions of PSR established within the different social media environments are needed to better understand the bonds social media

users form with social media celebrities. Future studies are also needed to more precisely identify different viewer profiles according to their characteristics in relation to the level of addiction to the platform. The current study highlighted the value of considering the content of YouTuber videos when investigating PSR. The content of the YouTubers' language, specifically evaluative self-disclosure in the case of this study, is associated with the intensity of the feeling of intimacy that viewers establish with their favorite YouTuber. Future studies should include other variables. For example, variables more precisely describing verbal and nonverbal communication such as gaze orientation or the direct addressing of viewers would be interesting to consider. Indeed, YouTubers' language style is known to be important for viewers (Aran-Ramspott et al., 2018; Cendekiaputri et al., 2021; Fägersten, 2017).

Conclusion

In conclusion, our study highlights the fact that YouTubers' self-disclosure, viewers' social anxiety, and avoidant attachment are associated with PSR dimensions. They also play a mediating role in the relationship between the desire to engage in parasocial processes with YouTubers and YouTube addiction. These results extend the findings of our previous study (de Bérail et al., 2019) and are in line with the parasocial compensation hypothesis literature and the social penetration theory as applied to PSR. Our results also contribute to the literature on YouTube addiction by identifying the existence of complementary mediation where viewers' desire to engage in parasocial processes mediates the relation between their level of social anxiety and their degree of YouTube addiction. Finally, this study underlines how important it is to treat PSR as a multidimensional construct and to further analyse the concept of PSR within the field of social media. It also encourages the development of qualitative studies in order to more precisely identify different facets of this concept.

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Conflict of Interest Disclosure

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Research Ethics Statement

The study was carried out in accordance with the research ethics guidelines of the authors' affiliated university, the French Code of Ethics for Psychologists and the APA's Ethical Principles of Psychologists and Code of Conduct. The participants involved in the online survey took part in the study voluntarily and provided informed consent.

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Appendix

Table A1. List of 72 YouTubers Named by Participants

Amixem	Farod	Le Woop	Norman
AnnaRvr	Gaelle Garcia Diaz	LinksTheSun	PewDiePie
Antastesia	Georgia Horackova	Lolywood	Poisson Fécond
Anthox Colaboy	Gotaga	LufyMakes YouUp	Prime
Ayo Coralie	Greg Guillotin	Mahdi Ba	robert 87000
Benjamin Verrecchia	GuiHome	MamyTwink	Sananas
Bob Lennon	Horia	Marion Seclin	Sandrea
Chloé B	Ici Japon	Mary - Frozencrystal	Shera Kerienski
Cyprien	InThePanda	Math se fait des films !	Sissy MUA
Cyr!l	jenesuispasjolie	Maxenss	SolangeTeParle
Didi Chandouidoui	Jeremstar	McFly & Carlito	Squeezie
DirtyBiology	Joueur Du Grenier	Milababychou	Tibo InShape
Eimadolly	Karim Debbache	Mister V	Usul
Eloise Delhaye	La Carologie	MisterJDay	Vérino
Emma CakeCup	Le Corps La Maison L'esprit	MrBboy45	VodK
Emy LTR	Le Fossoyeur de Films	Nadjélika	Wankil Studio
EnjoyPhoenix	Le Grand JD	Natoo	ZeratoR
e-penser	Le Rire Jaune	Noemiemakeuptouch	Zoella

Table A2. List of All the YouTuber Variables

YouTubers variables	Scoring system	Krippendorff's alphas
Factual self-disclosure	4-point scale	0.82
Evaluative self-disclosure	4-point scale	0.91
Level of fictional content	4-point scale	0.91
Level of physical presence	4-point scale	0.86
Average length of the videos	Seconds	-
Average rhythm of publication	Days	-