

# What drives people's intention toward live stream broadcasting

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## Abstract

**Purpose** – The study aims to examine the relationships among personality traits (i.e. the Big Five personality traits and locus of control), self-perceived facial attractiveness, motivations (i.e. intrinsic and extrinsic motivation) and intention toward live stream broadcasting. It also investigates the moderating role of perceived behavioral control in the relationship between motivations and intention.

**Design/methodology/approach** – Data collected from a sample of 637 participants are used to examine the research model and test the hypotheses with the employment of partial least squares structural equation modeling.

**Findings** – The study shows that motivations and perceived behavioral control are significant predictors of intention. Perceived behavioral control has a significant moderating effect between motivations and intention. Intrinsic motivation is positively influenced by self-perceived facial attractiveness, agreeableness, extraversion and internal locus of control, while extrinsic motivation is positively predicted by self-perceived facial attractiveness, conscientiousness and extraversion.

**Originality/value** – This study enhances our understanding of the determinants of intention toward live stream broadcasting by exploring its relationships with motivations, self-perceived facial attractiveness and personality, as well as the moderating effects of perceived behavioral control.

**Keywords** Intention toward live stream broadcasting, Perceived behavioral control, Extrinsic motivation, Intrinsic motivation, Personality traits, Facial attractiveness

**Paper type** Research paper

## 1. Introduction

Social video content creation activities (e.g. live stream broadcasts) produced by individuals and distributed through different social live streaming sites such as YouTube Live, Facebook Live, Twitter Live and Twitch.tv have become mainstream over the past few years (Sjöblom *et al.*, 2019). For instance, the [Taiwan Network Information Center \(2019\)](#) indicated that 84.5% of 2,134 Taiwanese respondents spent time watching live stream videos. Ones that draw huge online audiences usually involve complicated socio-cultural and socio-economic connections between live stream broadcasters (content creators) and viewers (current and potential content consumers) through real-time interactions and feedback (Sjöblom *et al.*, 2019). For example, in 2019, 1.256 million concurrent viewers collectively watched over 660 billion



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minutes of live streamed video content distributed by 3.64 million unique live stream broadcasters on average per month on Twitch.tv, one of the most popular online live streaming platforms (TwitchTracker, 2020). Moreover, Chen *et al.*'s (2019) study indicates the employment of a live stream broadcasting strategy has shown a 39.1% increase in online sales volume.

As a blooming and trending phenomenon, live stream broadcasting has become an attractive research subject (Chen *et al.*, 2019). However, research is still relatively limited on the viewer side (Wang *et al.*, 2019); moreover, the studies conducted by Hou *et al.* (2020) and Wang (2019) focus on underexplored live stream broadcasters' broadcasting behaviors (Zhou *et al.*, 2019). As an overwhelming number of amateur and professional live stream broadcasters devote themselves to this industry, they are likely to recognize the associated tangible and intangible incentives and potentially see this as a viable career path. However, when they recognize that the industry is very competitive, they may also feel stressed, or feel that this career path is a precarious one in the long term (Johnson and Woodcock, 2019). It is crucial to conduct studies on intention toward live stream broadcasting to promote live stream broadcasts among individuals, as behavioral intention has been proven to be an optimal determinant of actual behavior (e.g. Bolduc and Kinnally, 2018). To date, little research has investigated live stream broadcasters' intention toward live stream broadcasting, and thus, the underlying mechanisms that facilitate live stream broadcasters' intention toward live stream broadcasting remain unclear. While live stream broadcasters can become professionalized (Johnson and Woodcock, 2019) and play a central role in attracting and influencing enormous numbers of viewers around the world, having approaches in promoting intention to live stream of prospective and current live stream broadcasters is critical to the success and sustainability of the live stream broadcasting sites. Hence, it is important to learn more about the factors that lead to live stream broadcasters' intention toward live stream broadcasting to generate effective strategies to draw, manage and sustain their participation and engagement in this industry.

Among the numerous antecedents of behavioral intention, motivation has been identified as the essential antecedent of individuals' behavioral intentions (e.g. Abduljalil and Zainuddin, 2015; Fagan *et al.*, 2008). Currently, only a few studies have begun to conduct qualitative examinations to understand the various motivations of live stream broadcasters (e.g. Friedländer, 2017; Skjuve and Brandtzaeg, 2020). The self-determination theory (SDT), which distinguishes between intrinsic and extrinsic motivation, is one of the most important contemporary motivational theories and has accumulated a body of research evidence demonstrating the influence of those two motivations on behavioral intentions in various online contexts. For example, in a study that explores streaming intention from the SDT perspective, Törhönen *et al.* (2020) have identified both intrinsic motivation aspects such as enjoyment, relaxation, self-expression, social interaction, altruism and skill development, as well as extrinsic motivation aspects such as career development, income and reputation. In addition, perceived behavioral control, as introduced by Ajzen (1991), has been shown to affect intentions (e.g. Bolduc and Kinnally, 2018; Kinnally and Bolduc, 2020) and also act as a moderating influence on behavioral intention (e.g. Martinez and Lewis, 2016). There has yet to be a study that looks at the role of perceived behavioral control of live stream broadcasters: it is important to study the effects on behavioral intention and the potential moderating effects on the motivation–intention links within the context of live stream.

Personality traits have been shown to be an important predictor of motivations for online media usage, such as viewing live stream videos (e.g. van der Vaart, 2017) and playing online video games (e.g. Jeng and Teng, 2008). However, few studies have investigated the effects of personality traits (i.e. the Big Five personality trait dimensions and locus of control) of live stream broadcasters on their motivation to broadcast. Moreover, facial attractiveness in marketing and psychology have been shown to influence perceivers' impressions

(e.g. [Lorenzo et al., 2010](#)). The social relations between live stream broadcasters and viewers involve well-planned self-presentation and facial expressions: facial attractiveness can lead to advantages for live stream broadcasters with respect to attracting viewers ([Marwick, 2015](#)). Once prospective and current live stream broadcasters recognize such advantages, self-perceived facial attractiveness may arouse motivation to live stream as considering working on live streaming. Therefore, this study firstly examines the predictive role of self-perceived facial attractiveness on motivations within the live stream broadcasting context.

Using the partial least squares structural equation modeling (PLS-SEM) method, the current study develops a comprehensive causal model on intention toward live stream broadcasting that relates constructs such as motivation, personality and self-perceived facial attractiveness with perceived behavioral control acting as a moderator. In so doing, the study contributes to the existing body of research in the following ways. First, it extends the literature on intention toward live stream broadcasting in general by proposing a structural modeling approach to uncover the interrelationships among the influence factors. Second, based on the findings of the study on live stream broadcasters' intention toward live stream broadcasting, suggestions for can be made to improve the engagement and retention of live stream broadcasters by increasing their intention toward live stream broadcasting.

## 2. Theoretical development

### 2.1 *Intention toward live stream broadcasting*

Live streaming entails an individual synchronously broadcasting self-recorded live video content to a potentially large number of viewers that the individual can interact with over the internet using a computer webcam or a smartphone or tablet camera ([Scheibe et al., 2016](#)). The themes and aims of live streaming are decided by live stream broadcasters themselves. For example, [Fraser et al. \(2019\)](#) analyzed the range of creative activities individuals stream on social live streaming sites and identified four common types of creative livestreams: educating viewers with step-by-step how-to demonstrations, exhibiting the process of creation (e.g. drawing), socializing with viewers while working on a project and performance (e.g. music or acting). Moreover, [Sjöblom et al. \(2019\)](#) classified the types of video gaming streams: casual structure or aim, playing a game from start to end, playing a game against other players, showing how to finish a game as quickly as possible, demonstrating how to play the game, reviewing and commenting on a video game, and holding a talk show focused on a game.

During a live stream, various interactions can occur between live stream broadcasters and viewers: exchanging online synchronous or asynchronous messages and reacting with emojis (e.g. likes) or rewards (e.g. virtual gifts, cash donations or subscriptions to live stream broadcaster channels). Subscriptions, cash donations and virtual gifts made by viewers with real-world money become broadcaster revenue streams ([Wang et al., 2019](#)). Revenues may also stem from in-stream advertisements, as well as advertisements and sponsorships that promote the products or offerings of commercial companies and organizations ([Woodcock and Johnson, 2019a](#)): these typically require that live stream broadcasters demonstrate sufficient influence in terms of viewers ([Woodcock and Johnson, 2019a, b](#)). Some live stream broadcasters earn an amount commensurate with a full-time salary ([Johnson, 2019](#)).

Live stream broadcasters may simply start with a small amount of technical knowledge and a sufficiently fast internet connection to create and broadcast their live content ([Woodcock and Johnson, 2019b](#)), but “the practices of self-presentation, self-promotion and entrepreneurial enterprise” are critical when it comes to being a financially successful live stream broadcaster ([Johnson et al., 2019](#), p. 1). Live stream broadcasters need to be willing to put in long hours both online and offline ([Johnson and Woodcock, 2019](#)), engaging in affective

labor in relationships with viewers and demonstrate creativity if they want to be able to make money at it (Woodcock and Johnson, 2019a). For example, Woodcock and Johnson (2019a) interviewed professional and aspiring professional game streamers on Twitch.tv and found that they strived to invent a presentable, socially active and emotionally responsive personality that would stand the test of time with viewers; they also developed a distinct approach to interacting with their viewers to effectively attract audiences to their streams and maintain continued engagement. Moreover, live stream broadcasters who successfully monetize their content broadcast plenty of hours per week (Johnson and Woodcock, 2019; Woodcock and Johnson, 2019a) stick to a regular streaming schedule (Johnson and Woodcock, 2019), set up streams correctly, broadcast streams in a timely manner and promote the streams with convincing numerical evidence by appropriately analyzing their streaming data (Woodcock and Johnson, 2019b).

Within the current study context, intention toward live stream broadcasting refers to individuals' intentional willingness to broadcast live. Researchers have proposed that a specific action that individuals commit to is affected by their intention to act (e.g. Ajzen, 1991; Fishbein and Ajzen, 1975). The link between intention and actual action has been well proven in past studies related to technology adoption behaviors, such as entrepreneurs' usage of information system (IS) innovations (Moghavvemi *et al.*, 2016). Based on this line of thinking, individuals with a strong intention toward live stream broadcasting tend to perform corresponding live stream broadcasting activities. Relatively speaking, when intention toward live stream broadcasting is inadequate, live stream broadcasting behavior may not be feasible. While it is essential to investigate intention toward live stream broadcasting, as of yet, little research has been conducted to explore the factors that contribute to intention toward live stream broadcasting. The current study helps to determine and understand the antecedents of intention toward live stream broadcasting.

## 2.2 Intrinsic and extrinsic motivation

SDT, as proposed by Deci and Ryan in 1985, suggests that different forms of motivation exist when individuals make choices regarding taking actions, which are more or less self-determined based on satisfaction of basic individual psychological needs (i.e. autonomy, competence and relatedness) (Ryan and Deci, 2000). When individuals feel competent, autonomous and connected to others, they can become self-determined and then develop intrinsic motivation or engage spontaneously in an action based on the inherent interest, enjoyment, pleasure or challenge associated with the action itself. However, if their basic needs are not satisfied, individuals tend to be motivated extrinsically, such that they engage in an action to obtain outcomes (e.g. rewards or punishments) that stem from external sources such as society or social interaction. Even though intrinsic motivation differs from extrinsic motivation, it is rare that actions are driven by only one of the two (Deci and Ryan, 1985) due to complex aspects of human behavior.

In the live stream broadcasting context, some researchers have suggested that intrinsic motivation may encourage individuals to engage in live stream broadcasting activities because of inherent tendencies: to seek out challenges (Zhao *et al.*, 2018); for self-enjoyment of tasks (Törhönen *et al.*, 2020; Zhao *et al.*, 2018); and because of a desire for self-presentation (Zhao *et al.*, 2018), self-expression (Törhönen *et al.*, 2020), relaxation (Törhönen *et al.*, 2020), social interaction (Törhönen *et al.*, 2020), altruism, (Törhönen *et al.*, 2020) or skill development (Törhönen *et al.*, 2020). Results from studies that investigated the link between intrinsic motivation and live stream broadcasting intentions have consistently shown that intrinsic motivation is a positively significant factor. For example, Törhönen *et al.* (2020) discovered that intrinsic motivation significantly and positively predicted streaming intention (i.e. producing, sharing and posting video content online). Likewise, Bründl and Hess (2016) found

that feelings of enjoyment significantly and positively predicted intention to continue content contribution.

By contrast, extrinsic motivation is associated with rewards for live stream broadcasting; these are often anticipated rewards (Zhao *et al.*, 2018) pertaining to career development (Törhönen *et al.*, 2020), increased income or reputation (Törhönen *et al.*, 2020), self-esteem benefits (Zhao *et al.*, 2018), social benefits (Zhao *et al.*, 2018) or feedback (Zhao *et al.*, 2018). Thus far, the results regarding the association between extrinsic motivations and intentions have been inconsistent. For example, Törhönen *et al.* (2020) have shown that extrinsic motivation positively predicted streaming intention, but only marginally. Bründl and Hess (2016) noted that self-expression and identity factors (i.e. becoming famous, being noticed by others and having a huge audience), as well as monetary incentives, were two examples of extrinsic motivation, but that each had a different impact on continuance intention: the former was significant but negative, while the latter was insignificant.

Thus, consistent with the SDT and previous research findings, it is hypothesized in this study that both intrinsic and extrinsic motivations share positive relationships with intention toward live stream broadcasting.

- H1. Intrinsic motivation positively influences intention toward live stream broadcasting.
- H2. Extrinsic motivation positively influences intention toward live stream broadcasting.

### *2.3 Perceived behavioral control*

Differing from real behavioral control, perceived behavioral control is understood as individuals' perceptions about the ease or difficulty of implementing a particular behavior (Ajzen, 2002). Perceived behavioral control considers the potential for possible barriers, restraints or struggles while performing the behavior (Ajzen, 1991) and assesses and weighs these against the skills and abilities possessed by an individual, as well as the important resources and opportunities available to them (Barnett and Presley, 2004). Perceived behavioral control is defined in this study as individuals' perceived ease or difficulty of performing live stream broadcasting behaviors. Assuming that they are capable of directly influencing behavioral intention (e.g. Ajzen, 1991), there is empirical support for the direct linkage between perceived behavioral control and behavioral intention across many behavioral contexts, including music streaming intentions and behavior (e.g. Bolduc and Kinnally, 2018; Kinnally and Bolduc, 2020). In the context of live stream broadcasting, it may follow that live stream broadcasters who believe they have the skills, resources and opportunities required to perform live stream broadcasting behaviors also think they can freely decide to use those resources, and therefore may have a strong intention to engage in live stream broadcasting behaviors.

Additionally, some research suggests that an interaction effect exists between perceived behavioral control and other predictors of behavioral intention to influence behavioral intention (e.g. Barua, 2013; Yzer, 2007). Several studies have been carried out to determine the moderating effect of perceived behavioral control, especially on the relationship between attitude and behavioral intention (e.g. Martinez and Lewis, 2016) and the relationship between subjective norms and behavioral intention (e.g. Martinez and Lewis, 2016). Although no study has empirically examined how perceived behavioral control acts as a moderator variable when interacting with intrinsic and extrinsic motivation, it is possible that individuals' intrinsic or extrinsic motivation becomes less relevant in shaping their intention toward live stream broadcasting when they perceive a lack of skills, ability, resources or opportunities required to perform the behavior. By contrast, with high perceived behavioral control, motivations become more relevant in intention formation. Therefore, this study

posits that perceived behavioral control will not only have a positive relationship with intention toward live stream broadcasting, but also have a positive moderating effect on the relationship between intrinsic or extrinsic motivation and intention.

- H3.* Perceived behavioral control positively influences intention toward live stream broadcasting.
- H4.* The influence of intrinsic motivation on intentions toward live stream broadcasting differs between participants with high perceived behavioral control versus participants with low perceived behavioral control.
- H5.* The influence of extrinsic motivation on intentions toward live stream broadcasting differs between participants with high perceived behavioral control versus participants with low perceived behavioral control.

#### 2.4 Facial attractiveness

Facial attractiveness is a pleasing emotional experience associated with a willingness to be close to a target individual based on their facial features (Kou *et al.*, 2020) and has been more used as a judgment about the overall attractiveness of an individual compared to bodily attractiveness (Mueser *et al.*, 1984). Through verifying the “beauty is good” stereotype, researchers have revealed that facial attractiveness evaluated by self-perception or others’ perceptions plays an important role in first impressions associated with evaluating an individual’s goodness (Lorenzo *et al.*, 2010) as well as daily social interactions (Dion *et al.*, 1972; Langlois *et al.*, 2000); in turn, it can be used to capture perceivers’ unconscious visual attention (Hung *et al.*, 2016) and perceivers’ desire to develop close social bonds with attractive individuals (Lemay *et al.*, 2010). In the context of live stream broadcasting, it is no wonder that both live stream broadcasters (e.g. Tirazona, 2018) and viewers (e.g. Cai *et al.*, 2018) agree that facial attractiveness is an important factor that attracts viewers to watch live stream broadcasts.

Attractive individuals who are admired, pursued and accustomed to public attention tend to feel capable of performing well at social tasks (e.g. making friends) and appealing to others (Baumeister, 1993), as well as expressing themselves without restraint (Chang, 2019). Moreover, attractive individuals tend to experience higher popularity, receive higher social reputation, attain greater occupational success (Langlois *et al.*, 2000) and have higher earnings (Scholz and Sicinski, 2015). Thus, individuals with self-perceived facial attractiveness may find live stream broadcasting activities to be more positively reinforcing because of their capability of broadcasting themselves and their activities and interacting with viewers, thereby facilitating intrinsic motivation. Moreover, they may be extrinsically motivated to perform live stream broadcasting activities that can bring them financial rewards and social recognition. The following hypotheses are proposed based on this evidence:

- H6.* Self-perceived facial attractiveness positively influences intrinsic motivation.
- H7.* Self-perceived facial attractiveness positively influences extrinsic motivation.

#### 2.5 Big Five personality traits

The Big Five approach to personality, especially with regard to the stability of the five personality trait dimensions across different life stage periods (Damian *et al.*, 2019), continues to be seen as the most widely accepted approach to study personality in various technology-related contexts (e.g. Zhao *et al.*, 2019), including online games (e.g. Jeng and Teng, 2008), and e-commerce (e.g. Leong *et al.*, 2017) across various cultural contexts. The five dimensions

include agreeableness (i.e. inclination to be compassionate, amiable, courteous and empathetic), conscientiousness (i.e. inclination or tendency to be efficient, organized and self-disciplined), extraversion (i.e. inclination to be outgoing, talkative and energetic), openness (i.e. inclination to be curious, inventive, creative and imaginative) and neuroticism (i.e. inclination to be sensitive and temperamental, as well as to experience negative emotions, such as nervousness). [Zhao et al. \(2019\)](#) conducted the only research study to this point on the live streaming broadcasting context: they analyzed the influence of personality characteristics of top streamers on polarity. Moreover, the influence of live stream broadcasters' personality traits on intrinsic and extrinsic motivation has not yet to be examined within the live stream broadcasting context.

Based on previous studies, four of the Big Five personality trait dimensions – agreeableness, conscientiousness, extraversion and openness to experience – appear to be relevant to intrinsic motivation regarding live stream broadcasting. As [Finn \(1997\)](#) noted, individuals who scored higher on agreeableness and openness to experience prefer to spend time talking to others in interpersonal contexts, while individuals with higher extroversion are likely to spend more time socializing with more people at social events. Moreover, [Sugathadasa and Pamarathna \(2019\)](#) found that higher levels of agreeableness, openness to experience and conscientiousness tend to be associated with increased self-disclosure of private information to others on social networking sites; in addition, frequent self-disclosures tend to increase viewers' feelings of familiarity and closeness toward the disclosers, which can be beneficial ([Lin and Utzab, 2017](#)) to the formation and maintenance of interpersonal relationships in online communities ([Sugathadasa and Pamarathna, 2019](#)). In addition, [Pour and Taheri \(2019\)](#) discovered that those associated with extroversion, openness to experience and agreeableness are more willing to share knowledge on social media. Hence, during live stream broadcasts, individuals who score higher on agreeableness, conscientiousness, extraversion and openness to experience may experience feelings of enjoyment, competence and satisfaction while conversing with viewers or sharing their knowledge or personal life experiences, and thus be intrinsically motivated to perform more live stream broadcasts. The following hypotheses are proposed based on this evidence:

*H8.* Agreeableness is positively related to intrinsic motivation.

*H9.* Conscientiousness is positively related to intrinsic motivation.

*H10.* Extraversion is positively related to intrinsic motivation.

*H11.* Openness to experience is positively related to intrinsic motivation.

By contrast, extrinsic motivation toward live stream broadcasting may relate to three of the Big Five personality trait dimensions: conscientiousness, extraversion and neuroticism. According to [Kim et al. \(2017\)](#), extraverted individuals tend to pursue recognition from others by conveying opinions and thoughts on social networking sites, while neurotic individuals are less likely to seek out such recognition. Both extraverted and neurotic individuals tend to seek economic value (e.g. promotional incentives and prizes) from social networking sites. As for conscientiousness, prior research has suggested conscientious individuals focus more on the attainment of real-world achievement and less on using the internet and social networking for leisure purposes ([Ryan and Xenos, 2011](#)). While live streaming can be turned into a full-time job ([Zhao et al., 2019](#)), conscientious individuals may be attracted to live stream broadcasting activities that can bring them material rewards. [Zhao et al.'s \(2019\)](#) study further discovered live stream broadcasters with high levels of conscientiousness were more likely to use social networking sites as marketing tools to convince potential viewers to watch their live streams. Moreover, [Judge et al. \(1999\)](#) discovered that both high conscientiousness

and high extraversion are positively associated with both extrinsic career success (i.e. salary and promotions) and high income, in contrast to high neuroticism. Likewise, [Sutin et al. \(2009\)](#) found that conscientiousness was positively related to annual income and extraversion predicted increases in income across ten years, whereas neuroticism was negatively related to annual income. Based on these results, highly conscientious and extraverted individuals may be extrinsically motivated to perform live stream broadcasting activities based on their ability to obtain financial rewards and social recognition by doing so; highly neurotic individuals may be less likely to be extrinsically motivated to perform these types of activities. The following hypotheses are proposed based on the above evidence:

*H12.* Conscientiousness is positively related to extrinsic motivation.

*H13.* Extraversion is positively related to extrinsic motivation.

*H14.* Neuroticism is negatively related to extrinsic motivation.

### *2.6 Locus of control*

Internal versus external locus of control refers to beliefs regarding the degree to which an individual expects that life event outcomes are contingent on one's own effort, ability or actions versus the degree to which an individual expects that these outcomes are the function of chance, luck or fate ([Rotter, 1966](#)). The relationship between locus of control and motivation has not been investigated in the live stream broadcasting context; however, within educational and occupational contexts (e.g. [Ng et al., 2006](#); [Parameswari and Shamala, 2012](#)), there have been mixed results. For example, locus of control showed insignificant correlation with academic motivations (i.e. intrinsic and extrinsic motivation) of engineering students in [Parameswari and Shamala's \(2012\)](#) study, but a significant association with employees' intrinsic motivation in [Ng et al.'s \(2006\)](#) meta-analysis.

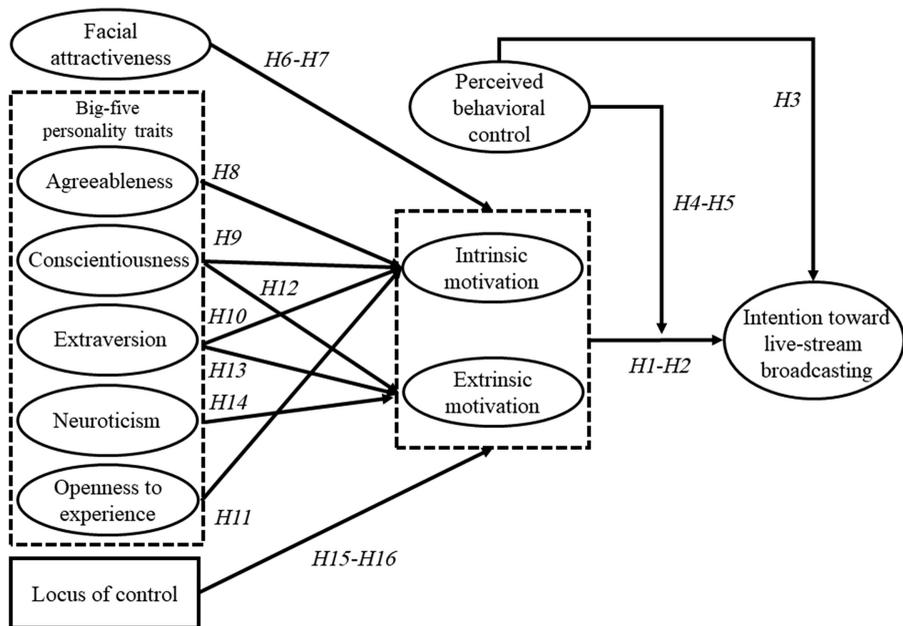
Previous studies have shown that compared to external locus of control, people with an internal locus of control tend to be more action oriented ([Hoffman et al., 2003](#)), more willing to self-disclose public and private information ([Ryckman et al., 1973](#)), more socially humorous ([Lefcourt et al., 1974](#)) and more willing to share knowledge with others to expand their own knowledge and resources ([Karkouljian and Mahseredjian, 2009](#)). According to [Lam and Mizerski \(2005\)](#), an internal locus of control also tends to encourage word-of-mouth communication on discussion boards with people other than family and friends; an external locus of control encourages more word-of-mouth communication with close friends and family. Moreover, individuals with an internal locus of control are likely to seek social recognition ([Betoret, 2013](#)) and obtain higher wages in the workplace ([Ahn, 2015](#)). Hence, a live stream broadcasting activity may provide individuals with high levels of internal locus of control who strongly believe in their ability and effort to influence others a way to share information and knowledge and communicate with viewers, and thereby, they may build interest in the activity itself. Additionally, individuals with an internal locus of control may be extrinsically motivated to perform live stream broadcasting activities to gain financial rewards and social cognition. Accordingly, hypotheses related to internal locus of control are as follows:

*H15.* Internal locus of control is positively related to intrinsic motivation.

*H16.* Internal locus of control is positively related to extrinsic motivation.

### *2.7 Modeling intention toward live stream broadcasting*

Based on the preceding discussion, the research model shown in [Figure 1](#) identifies the key constructs and relationships investigated in this study.



**Figure 1.**  
Research model

### 3. Research methodology

#### 3.1 Data collection and sample characteristics

An online survey was distributed through Facebook for a period of two months to invite participants. The study provided incentive vouchers to 33 participants drawn at random from those who participated. This resulted in an effective sample of 637 Taiwanese for the subsequent statistical analyses. Demographic information collected from participants included gender (54.16% male, 45.84% female), age (4.08% were under 20, 33.91% were 21–30, 13.19% were 31–40, 13.81% were 41–50 and 35.01% were over 50) and level of education (10.99% held a high school diploma or equivalent, 54.63% held a bachelor's degree and 34.38% held a master's degree or higher). The median income of most participants (37.68%) was above NTD\$50,000. Finally, 28.41% of participants had taken a course related to photography, and 4.40% had been or were currently live stream broadcasters.

#### 3.2 Measures

All the measurement items for the research constructs were adapted and modified from the existing literature. The Big Five personality traits were measured using John *et al.*'s (1991) 44-item Big Five Inventory that has been demonstrated to have good reliability for each dimension and validity in studies (e.g. John and Srivastava, 1999). Two items for measuring self-perceived facial attractiveness were developed based on the beauty dimension of Geiler *et al.*'s (2018) appearance scale. Perceived behavioral control was measured using three items modified from Alleyne *et al.* (2015). The four-item intrinsic motivation scale, three-item extrinsic motivation scale and four-item intention to live stream scale were measured using items modified from Wang *et al.* (2016). Responses to the aforementioned measurement scales were measured on seven-point Likert scales anchored by "strongly disagree" and "strongly agree." Moreover, locus of control was measured using ten items, which Carducci's (2009) selected from Rotter's (1966) 29-item Internal-External Locus of Control scale that has been

widely adopted among various studies (Carducci, 2009). In this scale, each item consisted of two statements for participants to make a forced choice between. Higher scores were indicative of external locus of control and lower scores were indicative of internal locus of control.

## 4. Results

### 4.1 Measurement model

All continuous variables were checked for normality prior to entering the model for the examination by using the values for skewness and kurtosis. The values for skewness and kurtosis ranged from  $-0.91$  to  $1.20$  and  $-1.10$  to  $1.03$ , respectively, indicating that normality assumption was satisfactory, as the values for skewness between  $-3$  and  $3$ , and kurtosis between  $-8$  and  $8$  are considered acceptable (Kline, 2005). With the use of SmartPLS, the reliability and validity (i.e. convergent validity and discriminant validity) were estimated to ensure adequate measurement of all the research constructs but locus of control. The factor structure of the Big Five personality traits was not the same as in the original version: three items were deleted (one from the extraversion subscale, one from the openness-to-experience subscale and one from the agreeableness subscale) due to standardized factor loadings under  $0.6$ . Then, the Cronbach's alpha and composite reliability (CR) figures were examined to evaluate the reliability of the measurements. As shown in Table 1, these values exceeded the recommended threshold values of  $0.7$  (Hair *et al.*, 2012) and were considered satisfactory. Convergent validity was supported by all the average variance extracted (AVE) values, which exceeded the threshold value of  $0.5$ , suggested by Hair *et al.* (2012).

Moreover, as listed in Table 2, the heterotrait-monotrait (HTMT) ratio of correlations did not exceed the strict standard value of  $0.85$  (Henseler *et al.*, 2015), thus satisfying the discriminant validity condition. Additionally, the reliability of the locus of control scale expressed in terms of the Kuder-Richardson reliability coefficient (KR-20) was  $0.65$ , demonstrating marginal reliability (DeVellis, 2016).

### 4.2 Structural model and hypotheses testing

The PLS analysis results examining the structural paths and the coefficient of determination ( $R^2$ ) for the predictive accuracy of the research model are listed in Figure 2. Overall, all the variables accounted for  $56.6\%$  of the variance in intention toward live stream broadcasting.

As seen in Table 3, all but four hypotheses were supported. As hypothesized (H1–H3), level of intention was positively predicted by intrinsic motivation ( $\beta = 0.26$ ;  $p < 0.001$ ),

Constructs	Cronbach's $\alpha$	CR	FL	AVE
Self-perceived facial attractiveness	0.95	0.98	0.97–0.98	0.95
Big Five personality traits				
Agreeableness	0.90	0.92	0.67–0.86	0.59
Conscientiousness	0.93	0.94	0.74–0.84	0.65
Extraversion	0.93	0.94	0.62–0.90	0.71
Neuroticism	0.93	0.94	0.72–0.90	0.67
Openness to experience	0.90	0.92	0.62–0.88	0.56
Intrinsic motivation	0.94	0.95	0.90–0.93	0.84
Extrinsic motivation	0.83	0.89	0.81–0.89	0.74
Perceived behavioral control	0.92	0.95	0.91–0.95	0.87
Intention toward live stream broadcasting	0.90	0.93	0.80–0.91	0.73

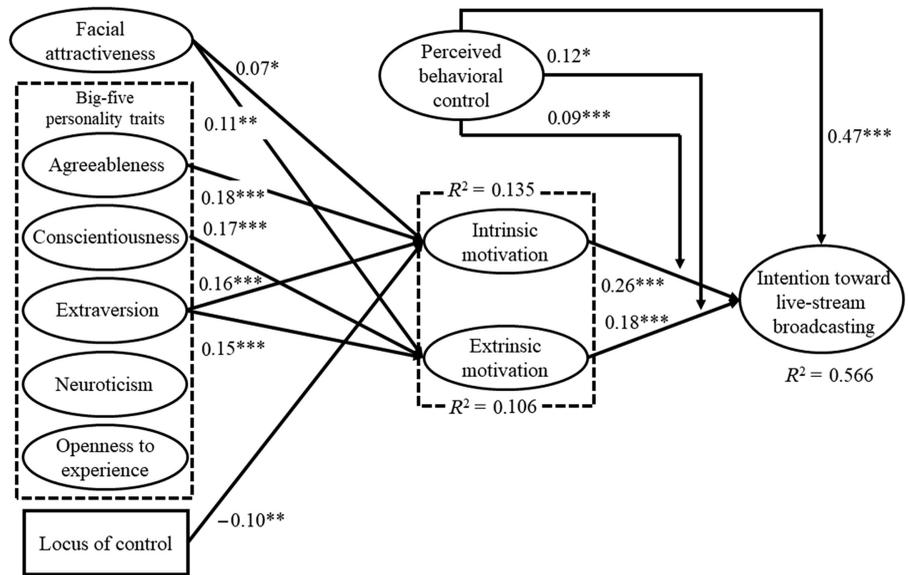
**Note(s):** CR: composite reliability; FL: factor loading; AVE: average variance extracted

**Table 1.**  
Descriptive statistics  
of constructs

Constructs	FA	A	C	E	N	O	IM	EM	I	PBC
FA	–									
A	0.37	–								
C	0.37	0.71	–							
E	0.39	0.67	0.41	–						
N	0.13	0.25	0.31	0.25	–					
O	0.43	0.61	0.59	0.52	0.13	–				
IM	0.22	0.34	0.24	0.32	0.05	0.22	–			
EM	0.25	0.31	0.28	0.29	0.06	0.22	0.72	–		
I	0.42	0.32	0.27	0.35	0.08	0.53	0.62	0.52	–	
PBC	0.54	0.43	0.33	0.48	0.11	0.38	0.48	0.37	0.71	–

**Note(s):** FA: self-perceived facial attractiveness; A: agreeableness; C: conscientiousness; E: extraversion; N: neuroticism; O: openness to experience; IM: intrinsic motivation; EM: extrinsic motivation; I: intention toward live stream broadcasting; PBC: perceived behavioral control

**Table 2.**  
HTMT results



**Figure 2.**  
PLS analysis results

extrinsic motivation ( $\beta = 0.18$ ;  $p < 0.001$ ) and perceived behavioral control ( $\beta = 0.47$ ;  $p < 0.001$ ). **H4–H5** proposed that perceived behavioral control moderated the effects that intrinsic and extrinsic motivation have on the intention of live stream broadcasters. Perceived behavioral control and intrinsic motivation had a significantly positive interaction effect on intention ( $\beta = 0.09$ ;  $p < 0.01$ ), as did perceived behavioral control and extrinsic motivation ( $\beta = 0.12$ ;  $p < 0.05$ ), confirming **H4** and **H5**. Moreover, self-perceived facial attractiveness was found to have positive and significant effects on intrinsic and extrinsic motivation ( $\beta = 0.07$ ;  $p < 0.05$ ;  $\beta = 0.11$ ;  $p < 0.01$ , respectively). Thus, **H6** and **H7** were supported. As for the hypotheses related to the effect of the Big Five personality traits on motivation, agreeableness and extraversion were shown to predict intrinsic motivation ( $\beta = 0.18$ ;  $p < 0.01$ ;  $\beta = 0.16$ ;  $p < 0.001$ , respectively), while conscientiousness and extraversion predicted extrinsic motivation ( $\beta = 0.17$ ;  $p < 0.001$ ;  $\beta = 0.15$ ;  $p < 0.001$ , respectively), offering support for **H8** and

**Table 3.**  
Hypothesis testing  
results

Hypothesis	Standard coefficients	Results
H1 Intrinsic motivation → Intention toward live stream broadcasting	0.26***	Supported
H2 Extrinsic motivation → Intention toward live stream broadcasting	0.18***	Supported
H3 Perceived behavioral control → Intention toward live stream broadcasting	0.47***	Supported
H4 Perceived behavioral control × Intrinsic motivation → Intention toward live stream broadcasting	0.09**	Supported
H5 Perceived behavioral control × Extrinsic motivation → Intention toward live stream broadcasting	0.12*	Supported
H6 Self-perceived facial attractiveness → Intrinsic motivation	0.07*	Supported
H7 Self-perceived facial attractiveness → Extrinsic motivation	0.11**	Supported
H8 Agreeableness → Intrinsic motivation	0.18**	Supported
H9 Conscientiousness → Intrinsic motivation	0.01	Rejected
H10 Conscientiousness → Extrinsic motivation	0.17***	Supported
H11 Extraversion → Intrinsic motivation	0.16***	Supported
H12 Extraversion → Extrinsic motivation	0.15***	Supported
H13 Neuroticism → Extrinsic motivation	0.06	Rejected
H14 Openness to experience → Intrinsic motivation	-0.01	Rejected
H15 Locus of control → Intrinsic motivation	-0.10**	Supported
H16 Locus of control → Extrinsic motivation	-0.03	Rejected

**Note(s):** \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

H10–H12. Lastly, as proposed in H15, locus of control negatively impacted intention ( $\beta = -0.10$ ;  $p < 0.01$ ). It should be noted that higher scores of locus of control indicated external locus of control. Thus, H15 was supported.

## 5. Discussion and implications

The aim of this study was to provide stakeholders in the live stream broadcasting industry with guidance on how to effectively draw, manage and sustain live stream broadcasters' participation and engagement based on empirical data regarding motivational and psychological factors that influence live stream broadcasting. This study contributes to the existing relevant literature by presenting and validating a model comprising personality traits (i.e. the Big Five personality trait dimensions and locus of control), self-perceived facial attractiveness, perceived behavioral control, motivation (i.e. intrinsic and extrinsic motivation) and intention toward live stream broadcasting to understand the factors that contribute to the intention toward live stream broadcasting. Overall, the research model results provide an empirical explanation of the factors affecting intention toward live stream broadcasting.

### 5.1 Theoretical implications

The results have several theoretical implications. First, the current study was triggered by a lack of research on live stream broadcasters' intentions to produce live stream broadcasts (Zhou *et al.*, 2019). Responding to this research gap, the current study applies SDT perspectives and identifies the critical roles of intrinsic and extrinsic motivation, as well as their antecedents (i.e. self-perceived facial attractiveness, Big Five personality dimensions and locus of control). While qualitative examinations are commonly used to explore motivations of live stream broadcasters (e.g. Friedländer, 2017; Skjuve and Brandtzaeg, 2020), this study is among the few to use quantitative measures to explore the underlying

intention toward live stream broadcasting based on intrinsic motivation, extrinsic motivation and perceived behavioral control. Moreover, the study incorporates perceived behavioral control into the SDT and recognizes the direct influence on intention and the moderating influence on the motivation–intention links. The current study tests the theoretical moderation of perceived behavioral control on motivation–intention links and contributes to empirical research in this area by successfully detecting the interactions.

Second, this study confirms SDT's general expectation and provides empirical evidence on the factors influencing intention toward live stream broadcasting. The study determines that the two types of motivation, and perceived behavioral control, positively and significantly affect intention toward live stream broadcasting simultaneously. The significant and positive link between intrinsic motivation and intention is consistent with prior work (e.g. [Bründl and Hess, 2016](#); [Törhönen et al., 2020](#)), but the significant and positive link between extrinsic motivation and intention is inconsistent (e.g. [Bründl and Hess, 2016](#); [Törhönen et al., 2020](#)). Perceived behavioral control is significantly and positively linked with intention, which is in line with research in many other behavioral contexts (e.g. [Bolduc and Kinnally, 2018](#); [Kinnally and Bolduc, 2020](#)). These results suggest both intrinsic motivation and extrinsic motivation, as well as perceived behavioral control, play stimulating roles in the enhancement of intention toward live stream broadcasting. Moreover, the moderating effect of perceived behavioral control was significant in regard to the relationship between both intrinsic and extrinsic motivation and intention toward live stream broadcasting, which concurs with the assumptions of [Barua \(2013\)](#) and [Yzer \(2007\)](#) for the potential moderating influence of perceived behavioral control. These findings suggest that the influence of intrinsic and extrinsic motivation on intention toward live stream broadcasting may vary among individuals with different levels of perceived behavioral control. These predictors of intention toward live stream broadcasting can explain more than 55% of the variance of intention toward live stream broadcasting. According to the magnitudes of the impacts of the three predictors, perceived behavioral control shows the biggest impact on intention toward live stream broadcasting, followed by intrinsic motivation.

Third, this study classifies the antecedents of motivation as self-perceived facial attractiveness, the Big Five personality trait dimensions and locus of control and identifies several key antecedents for each type of motivation. More specifically, intrinsic motivation to live stream is positively related to self-perceived facial attractiveness, agreeableness, extraversion and internal locus of control, suggesting that individuals who rate highly on these traits tend to exhibit an increased level of intrinsic motivation to live stream. The finding regarding the significant relationship between internal locus of control and intrinsic motivation confirm previous study conducted by [Ng et al. \(2006\)](#) in the occupational context. Considering the magnitude of the impacts of the four antecedents, agreeableness and extraversion have a stronger impact on intrinsic motivation, while self-perceived facial attractiveness, conscientiousness and extraversion as positively associated with extrinsic motivation. These results suggest that individuals who rate their own facial attractiveness as high, and have high levels of conscientiousness and extraversion, are likely to foster their extrinsic motivation to live stream. With respect to magnitude, all three factors exhibit similar impacts on extrinsic motivation.

Finally, this study uses PLS modeling to test the research model and comprehensively understand the determinants of intention toward live stream broadcasting.

### *5.2 Practical implications*

This study has several implications for stakeholders in the live stream broadcasting industry to promote individuals' intention toward live stream broadcasting. First, intentions can be strengthened both intrinsically and extrinsically, although the effects of the former are stronger than those of the latter for live stream broadcasters. Thus, stakeholders in the live

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stream broadcasting industry should focus on creating mechanisms to facilitate intrinsic motivation (i.e. feelings of enjoyment, competency and satisfaction) while not forgetting extrinsic motivation (i.e. gaining recognition, earning money and fulfilling dreams).

In addition to motivation, individuals perceiving that they have higher levels of behavioral control over the outcomes of live stream broadcasting activities tend to intensify their intention toward live stream broadcasting, while those perceiving low levels of behavioral control are less likely to live stream. Hence, to facilitate live stream broadcasters' perceived behavioral control, stakeholders in the live stream broadcasting industry can create mechanisms to increase live stream broadcasters' skills, abilities and successful experiences with respect to live stream broadcasting, as well as provide resources, opportunities and assistance before and when difficulties and challenges are encountered. Furthermore, the results obtained in this study show that perceived behavioral control also moderates the effect of motivation on intention. These findings imply that decreased levels of intrinsic motivation and extrinsic incentives on intention toward live stream broadcasting can be buffered by high levels of perceived behavioral control. Therefore, stakeholders should be aware of this moderating effect when developing mechanisms to motivate live stream broadcasters. When stakeholders devise strategies to motivate live stream broadcasters using internal factors and external incentives, it is important that they increase live stream broadcasters' levels of perceived behavioral control at the same time.

Second, extraverted individuals and individuals who regard themselves as having attractive facial features are more likely to live stream when their surroundings elicit their intrinsic motivation and also contain extrinsic rewards, while individuals high in agreeableness and internal locus of control are more likely to live stream only when their surroundings elicit intrinsic motivation. By contrast, conscientious individuals are more likely to live stream in situations that foster extrinsic motivation. Therefore, while stakeholders plan to recruit prospective live stream broadcasters to start and encourage current live stream broadcasters to continue live streaming, focusing on intrinsic motivation (e.g. having live streaming tasks that individuals will find enjoyable, pleasant, happy and exciting to work on) is a more effective way of encouraging those who self-rate their facial features highly, those with an internal locus of control, as well as those who are highly agreeable or extraverted to live stream, while external rewards (e.g. receiving pecuniary benefits, gaining recognition and fulfilling dreams from live streaming broadcasting) may be more effective to encourage conscientious and extraverted individuals to live stream.

## 6. Limitations and future research directions

A few limitations associated with this study must be addressed. First, the study used an unrestricted self-selected online survey as a type of convenience sampling (Fricker, 2017), and thus, this may limit the generalizability of the results to populations other than that studied. Also, the study solely collected the data from Taiwan. Previous studies have noted that individuals' cultural backgrounds may impact motivations (Hofstede, 1980) and behavioral intentions to use technology (Hung and Chou, 2014). This could represent a limitation because live stream broadcasters from other countries with different values might have different ways of considering the research constructs. Hence, the generalizability of the findings may be restricted. Future studies may extend the research results by making comparisons using results from different countries. Moreover, the sample in this study was largely comprised of prospective live stream broadcasters, as opposed to experienced live stream broadcasters. Although the inclusion of both prospective and experienced live stream broadcasters can be considered a strength, the results should be interpreted carefully since live stream broadcasters who have or had already live streamed might have different perceptions about the research constructs measured in this study. Future research may differentiate between

the underlying mechanisms that impact intentions by comparing live stream broadcasters with different levels of live stream experience.

## 7. Conclusions

This study develops and tests an empirical model for the determinants of individuals' intention toward live stream broadcasting with the integration of SDT. The model demonstrates the important roles of extrinsic motivation, intrinsic motivation and perceived behavioral control in facilitating individuals' intention toward live stream broadcasting. Moreover, the study also identified that self-perceived facial attractiveness, agreeableness, extraversion and internal locus of control positively influence intrinsic motivation. Relatively, self-perceived facial attractiveness, conscientiousness and extraversion positively predict extrinsic motivation. The findings provide important insights for future research as well as practical implications for understanding intention toward live stream broadcasting to expand the success and sustainability of the live stream broadcasting site.

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## Appendix

### Construct measures used in this study

#### Perceived behavioral control (seven-point Likert scale)

- PBC1: I have the ability to become a live stream broadcaster.
- PBC2: It is easy for me to become a live stream broadcaster.
- PBC3: If I want to, I can use the internet to live stream easily.

#### Self-perceived facial attractiveness (seven-point Likert scale)

- FA1: I receive high compliments on my appearance.
- FA2: I think my appearance is very attractive.

#### Intrinsic motivation (seven-point Likert scale)

- IM1: Becoming a live stream broadcaster is enjoyable.

IM2: The process of becoming a live stream broadcaster is pleasant.

IM3: Becoming a live stream broadcaster makes me happy.

IM4: The process of becoming a live stream broadcaster is exciting.

#### **Extrinsic motivation (seven-point Likert scale)**

EM1: I will receive pecuniary benefits by becoming a live stream broadcaster.

EM2: I will gain recognition by doing well in my live streaming.

EM3: Becoming a live stream broadcaster can fulfill my dreams.

#### **Intention toward live stream broadcasting (seven-point Likert scale)**

Int1: I intend to become a live stream broadcaster.

Int2: I have enough knowledge and skills to become a live stream broadcaster.

Int3: I think I am going to become a live stream broadcaster within one year.

Int4: I think I am going to become a live stream broadcaster within five years.

#### **Big Five personality traits (seven-point Likert scale)**

I see myself as someone who. . .

BF1-Extraversion: I see myself as someone who is talkative.

BF2-Agreeableness: I see myself as someone who tends to find fault with others.

BF3-Conscientiousness: I see myself as someone who does a thorough job.

BF4-Neuroticism: I see myself as someone who is depressed, blue.

BF5-Openness: I see myself as someone who is original, comes up with new ideas.

BF6-Extraversion: I see myself as someone who is reserved.

BF7-Agreeableness: I see myself as someone who is helpful and unselfish with others.

BF8-Conscientiousness: I see myself as someone who can be somewhat careless.

BF9-Neuroticism: I see myself as someone who is relaxed, handles stress well.

BF10-Openness: I see myself as someone who is curious about many different things.

BF11-Extraversion: I see myself as someone who is full of energy.

BF12-Agreeableness: Starts quarrels with others.

BF13-Conscientiousness: Is a reliable worker.

BF14-Neuroticism: Can be tense.

BF15-Openness: Is ingenious, a deep thinker.

BF16-Extraversion: Generates a lot of enthusiasm.

BF17-Agreeableness: Has a forgiving nature.

BF18-Conscientiousness: Tends to be disorganized.

BF19-Neuroticism: Worries a lot.

BF20-Openness: Has an active imagination.

BF21-Extraversion: Tends to be quiet.

- BF22-Agreeableness: Is generally trusting.
- BF23-Conscientiousness: Tends to be lazy.
- BF24-Neuroticism: Is emotionally stable, not easily upset.
- BF25-Openness: Is inventive.
- BF26-Extraversion: Has an assertive personality.
- BF27-Agreeableness: Can be cold and aloof.
- BF28-Conscientiousness: Perseveres until the task is finished.
- BF29-Neuroticism: Can be moody.
- BF30-Openness: Values artistic, aesthetic experiences.
- BF31-Extraversion: Is sometimes shy, inhibited.
- BF32-Agreeableness: Is considerate and kind to almost everyone.
- BF33-Conscientiousness: Does things efficiently.
- BF34-Neuroticism: Remains calm in tense situations.
- BF35-Openness: Prefers work that is routine.
- BF36-Extraversion: Is outgoing, sociable.
- BF37-Agreeableness: Is sometimes rude to others.
- BF38-Conscientiousness: Makes plans and follows through with them.
- BF39-Neuroticism: Gets nervous easily.
- BF40-Openness: Likes to reflect, play with ideas.
- BF41-Extraversion: Has few artistic interests.
- BF42-Agreeableness: Likes to cooperate with others.
- BF43-Conscientiousness: Is easily distracted.
- BF44-Neuroticism: Is sophisticated in art, music or literature.

**Locus of control**

- Loc1: I. People's misfortunes result from the mistakes they make.  
E. Many of the unhappy things in people's lives are partly due to bad luck.
- Loc 2: I. One of the major reasons why we have wars is because people do not take enough interest in politics.  
E. There will always be wars, no matter how hard people try to prevent them.
- Loc 3: I. Capable people who fail to become leaders have not taken advantage of their opportunities.  
E. Without the right breaks one cannot be an effective leader.
- Loc 4: I. In the case of the well-prepared student, there is rarely if ever such a thing as an unfair test.  
E. Many times, exam questions tend to be so unrelated to course work that studying is really useless.
- Loc 5: I. Getting people to do the right thing depends upon ability. Luck has little or nothing to do with it.  
E. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
- Loc6: I. Becoming a success is a matter of hard work, luck has little or nothing to do with it.

E. Getting a good job depends mainly on being in the right place at the right time.

Loc 7: I. How many friends you have depends upon how nice a person you are.

E. It is hard to know whether or not a person really likes you.

Loc8: I. With enough effort, we can wipe out political corruption.

E. It is difficult for people to have much control over the things politicians do in office.

Loc9: I. There is a direct connection between how hard I study and the grades I get.

E. Sometimes, I cannot understand how teachers arrive at the grades they give.

Loc10: I. People are lonely because they do not try to be friendly.

E. There is not much use in trying too hard to please people, if they like you, they like you.

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