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Personality predictors of flow among adolescents

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Flow is said to be associated with an enhancement in positive emotions and a reduction in negative emotions, and can potentially improve well-being. Flow, i.e., the optimal experience can be beneficial to mental health and productivity. This could be exceptionally important to adolescents who are constantly confronted with constant demands on adjustment owing to their developmental stage. The present study examines the personality predictors of flow among adolescents. The participants of this study include a sample of 200 adolescents from Kerala and Tamil Nadu (Males=100, Females=100) in the age group 13 to 17 years. The participants responded to a set of self-report measures that assessed their personality, flow state, flow experience, and dispositional flow. A One-Way ANOVA was used to examine if there was any significant difference between genders on HEXACO personality traits and flow. Additionally, multiple regression was used to identify the personality traits that predict the flow experience. ANOVA comparing gender on personality and flow found that females were higher on Honesty-Humility, Emotionality, Extraversion, Conscientiousness, and Openness to Experience and also was higher on flow state, dispositional flow, and overall flow experience. The result from multiple regression showed that Extraversion was a positive predictor of overall flow experience, flow state, and dispositional flow and personality traits like Honesty-Humility, Conscientiousness, Openness to Experience were positive predictors of flow state. Openness to Experience and Honesty-Humility predicted dispositional flow positively. The practical and research implications of the findings of the present study for positive psychology interventions are discussed.

Keywords: flow, personality, gender, HEXACO

A growing interest in research on the concept of flow is witnessed in the past few decades. Flow refers to an experiential state that is inherently gratifying, as something where awareness of themselves outside the activity diminishes, and where skills are in balance with the challenge induced by the activity (Csikzentmihalyi, 1975). The flow is characterized by a state where there is utmost concentration in doing a particular task to the extent that one is unaware of any external factors. In short, flow can be viewed as a state that is marked by intense and wrapped concentration, absence of self-consciousness, an amalgamation of action with awareness, increased sense of control on the task in hand, and change in perception of time (Csikszentmihalyi, 1975, 2000; Nakamura & Csikszentmihalyi, 2002).

The concept of 'Flow' appears in literature throughout history across different cultures. The idea of flow can be rooted back to the teachings of Buddhism and of a Chinese philosophical tradition called Taoism that refers to a mental state reflecting "action of inaction" or "doing without doing" (Wu Wei in Taoism). The advice given by Krishna, the charioteer to Arjuna in the Bhagavad Gita during the great battle also bears a resemblance to flow: Krishna asks Arjuna not to worry or think, and just to lose himself in the task that he has in hand. Further, Krishna is seen to have advised Arjuna to fight courageously, and to lead his men as best as he can, and adds that as long as one tries his best it does not matter if he wins or loses. Interest in the study of flow originated in the field of sport psychology and continues to have great attention in the field of sports psychology (Chavez, 2009; Jackman et al., 2014; Jackson, 1995; Jackson & Eklund, 2002; Koehn, 2013; Stavrou et al., 2015; Stein et al., 1995; Swann, 2016). However, there is a recent interest in studying flow in other areas across different settings and activities, including academics (Cermakova et al., 2010; Craig et al., 2004; Lee, 2005); work (Fullagar & Kelloway, 2009; Kim et al., 2019; Nielsen & Cleal, 2010); video gaming and online activities (Hamari et al., 2015; Shin, 2006; Skadberg & Kimmel, 2004); music and arts (Fritz & Avsec, 2007; Tietze, 2008). Research also indicates that flow can result in the optimization of work and competency and also vice-versa in school teachers (Salanova, Bakker, & Llorens, 2006). In addition to increasing positive affect and reducing negative affect, flow can enhance life satisfaction in older adults and students enrolled in undergraduate programs (Bassi et al., 2013; Collins et al., 2008; Rogatko, 2007). According to Bonaauto et al. (2016), irrespective of gender or age, various self-defining activities lead to an experience of flow in one's preferred place and are also strongly associated with one's own place identity. Lee (2005) reported that when there was no balance between students' perceived skills and task challenges they were more likely to procrastinate. It may be worthwhile to explore if any relationship exists between personality factors and flow experience. This area of research can provide better insights about the flow experience and can provide answers to the question, why some individuals are able to experience flow more than others.

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Students' academic achievement was related to their motivational beliefs (Steinmayr et al., 2018). Since flow itself is an intrinsically rewarding experience, Mills and Fullagar (2008) examined how the flow was related to several types of motivation, namely, intrinsic, extrinsic, and a motivation. It was found that flow experiences were strongly linked to self-determined forms of intrinsic motivation, and this is in support to the flow theory that states, intrinsic motivation is positively related to flow experience (Hektner & Csikszentmihalyi, 1996). Thus by improving flow, intrinsic motivation of a person also improves and vice versa, which in turn would improve academic achievement. Adolescents who engage in activities that provide "flow" experience for prolonged duration report experiencing higher levels of joy, and being progressively lively, approachable, and highly sociable (Massimini & Carli, 1988).

Individuals differ in the extent to which they can experience flow, and this individual difference is described as autotelic personality. Autotelic personality is the predisposition of individuals to involve themselves in activities that enables them to frequently experience flow states (Jackson & Eklund, 2002; Nakamura & Csikszentmihalyi, 2002). Those with autotelic personality actively seek challenges and flow experience. Since disposition to experience flow is an optimal characteristic, it is important to understand which are the traits that define autotelic personality. Some studies have examined the link between personality traits and flow-propensity. Personal innovativeness, self-efficacy and sense of control are identified as underlying dimensions of autotelic personality (Tan & Chou, 2011). In a study on amateur vocal students, it was found that those with high Extraversion scores experience a heightened flow than those with fewer Extraversion scores, and lesser flow experience is associated with high neuroticism scores (Heller et al., 2015). Adolescents with high scores on the Flow State scale also scored high on extraversion (Leibovich et al., 2013). There are contradictory findings from studies that examined the relationship between big five factors and flow. Bassi et al. (2013) report that no other personality factor of Big Five other than Openness to Experience were predictive of the type of activities associated with the flow among adolescents. On the other hand, Ross and Keiser (2014), report that big five factor model traits explained for 38% to over 50% of variances in flow-propensity. Flow propensity was found to be predicted by traits neuroticism, extraversion, agreeableness and conscientiousness, but not openness (Ross & Keiser, 2014).

Although according to Csikszentmihalyi (1990, p. 4), flow is addressed by both men and women essentially in the same words, there are often mixed findings on gender and flow. While some studies report no gender differences in regard to flow (Kee & Wang, 2008) some report that flow experience is higher in women than in men (Habe & Tement, 2016).

Positive psychology seeks to improve the well-being of an individual by examining strengths and positive aspects across his developmental stages rather than focusing on psychopathology and negative outcomes (Allen et al., 2017; Buckhardt, 2015). As our personality and values are formed during our childhood and adolescence, studying positive psychology concepts like flow enables us to focus and enhance preventive and proactive approaches to well-being. Hanson (2009) reported that flow stimulates concentration, positive emotions, motivation, self-esteem, optimism, and future-mindedness in adolescents. This will allow us to become a mentally and physically healthy adult and citizen that are essential for the development of any country.

The present study attempted to examine how flow differs between genders. In addition to this, the study also aimed at understanding how HEXACO personality factors were associated with flow. Flow in this study was examined in terms of flow experience, flow state, and dispositional flow.

Method

Participants

A sample of 200 adolescent students between 14 to 17 years of age (M = 15.43, SD = .81) were recruited from two states of Tamil Nadu (n = 100) and Kerala (n = 100). Both males and females were equally represented in the sample. About 19.5% of the sample were from 9th grade, 17% from 10th grade, and 63.5% were from 11th grade in school. The students in the were recruited from two schools located in Kerala and one school located in Tamil Nadu. All the schools were private schools following CBSE board. About 64.5% were from urban areas and 35.5% were from rural areas. Though the majority of the sample was Hindu (73.5%), the sample also included Christians (23%), and Muslims (3.5%). With regard to the community, the majority of the participants were from FC (39%), followed by BC (29.5%), OBC (20%), MBC (6.5%), and SC (5%).

Instruments

HEXACO Personality Inventory (Ashton & Lee, 2009). The scale is a 60 Likert type item with responses ranging from 1 (strongly disagree) to 4 (strongly Agree). The scale purports to assess the personality of subjects in terms of six personality dimensions, namely, Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience.

Individuals who are high on trait Honesty-Humility tend to be sincere, fair, modest, and free from greed and lead a simple lifestyle. They refrain from exploiting others, and are law abiders in nature. Those high on Emotionality get extremely anxious and fearful in response to life's stress and often need emotional support from others. They are empathetic and also get emotionally attached to people easily. Those who are high on extraversion are socially bold, enthusiastic, and full of energy and often have high positive regard for themselves. They enjoy social gatherings and making conversations with others easily. People who have a high score on Agreeableness are forgiving, trusting, gentle in judging others, compromising and flexible in cooperating with others, and has the tendency to remain calm even in stressful situations. People with high scores on the Conscientiousness subscale have good organization skills and have the capacity to deliberate carefully and to inhibit impulses. People with high scores on Openness subscale show greater capacity to experience, enjoy and appreciate the beauty in art and nature. They tend to be inquisitive, creative, and unconventional.

The reliability of Honesty-Humility subscale was 0.61, Emotionality subscale was .42, Extraversion was 0.33, Agreeableness was 0.15, Conscientiousness was 0.44, and Openness to Experience subscale was 0.34. Since the reliability coefficients of certain subscales were low, items that had poor item-sum correlation were removed from the specific subscales. Two items (53R & 35R) were removed from Emotionality subscale, four items (10R, 58, 16, 46R) were removed from Extraversion subscale, two items (26R & 38) were removed from

Conscientiousness subscale, and six items (31R, 25, 43, 19R, 7, & 55R) were removed from Openness to Experience subscale since these items had poor item-sum correlation. In the case of Agreeableness subscale, two items (15R & 21R) alone were retained since the rest of the items in the subscale had poor item-sum correlation.

After removing the items that had poor item-sum correlation, the reliability of the subscales improved considerably. The cronbach's alpha of Honesty and Humility subscale was 0.61, Emotionality subscale was 0.44, Extraversion subscale was 0.44, Agreeableness subscale was 0.36, Conscientiousness subscale was 0.49, and Openness to Experience subscale was 0.49.

Flow Short Scale (Rheinberg, Vollmeyer, & Engeser, 2003). The scale consists of 13 items with 3 subscales, viz., Fluency of performance, Absorption by activity, and Perceived fit of demands and skills. Each item of the scale is presented on a 7- point scale requiring the participant to choose one of the several response options ranging from 1 (not at all) to 7 (very much). Items 1 to 10 measure the components of flow experience and items 11 to13 measure the perceived importance or outcomes of the flow experience. The cronbach's alpha of the 13-item scale on the present sample was found to be 0.43. The items 4, 10, and 13 that had poor item-sum correlation were removed from the scale to improve the reliability of the scale. The cronbach's alpha of the 10-item scale on the present sample is 0.59.

Flow State Scale (FSS; Jackson & Marsh, 1996). The scale measures flow experience during physical activity. The scale consists of 36 items with 9 subscales. It is a 5 point Likert scale with response options ranging from 1 (Strongly disagree) to 4 (Strongly agree). The subscales represent the dimensions of flow discussed by Csikszentmihalyi (1990) namely, Challenge-Skill Balance, Action Awareness Merging, Clear Goals, Unambiguous Feedback, Concentration on Task at Hand, Sense of Control, Loss of Self-Consciousness, Transformation of Time and Autotelic Experience. In the present study, a single score arrived at by summing the scores obtained by the respondents on all the subscale was used for analysis. The cronbach's alpha of the scale on the present sample was 0.82.

Dispositional Flow Scale (DFS; Jackson, Martin, & Eklund, 2008). The scale was used to evaluate the inclination to experience flow in physical activity. It comprises 34 items with 9 subscales. The participants respond to the items on the scale using one of the several response options ranging from (1=strongly disagree) to 4 (strongly agree). The subscales include Merging of Action and Awareness, Challenge-Skill Balance, Sense of Control, Clear Goals, Autotelic Experience, Concentration on Task, Loss of Self-Consciousness, Transformation of Time, Unambiguous Feedback. In the present study, a single score arrived at by summing the scores obtained by the respondent on all the subscales was used for analysis. The cronbach's alpha of the scale on the present sample is 0.85.

Procedure

Data from 200 school students were collected from participants recruited from the states of Kerala and Tamil Nadu. Institutional approval to carry out the study was obtained in advance from the Principals of the schools and a convenient date and time were set for data collection. Written informed consent was obtained from the participants individually. The participants completed the survey in small groups in their classrooms during the working hours of the school.

Results

The statistical techniques used for the study are one-way ANOVA and multiple regression analysis. The one-way ANOVA was used to find the comparison between males and females, and multiple regression was used to understand the personality predictors of overall flow.

Table 1
Summary of ANOVA comparing males (n= 100) and females (n = 100) on the study variables.

Variable	Group	Mean	SD	F	p
Honesty-Humility	Male	33	5.57	19.90	.001
	Female	37	6.18		
Emotionality	Male	26	4.21	3.87	0.05
	Female	27	4.67		
Extraversion	Male	19	3.36	5.27	0.02
	Female	20	3.69		
Agreeableness	Male	6	1.90	1.88	0.17
	Female	6	1.91		
Conscientiousness	Male	23	4.11	7.01	0.01
	Female	25	4.24		
Openness to Experience	Male	12	2.95	26.60	.001
	Female	14	2.81		
Flow short	Male	41	8.90	9.74	0.00
	Female	45	8.01		
Flow State	Male	121	16.82	12.89	.001
	Female	129	11.87		
Dispositional Flow	Male	113	15.79	17.19	.001
	Female	121	13.68		

A one-way analysis of variance was carried out to examine the gender differences on the study variable. As may be seen from the table above, there was significant difference between genders on Honesty-Humility factor, F (1,189) = 19.90, p = .001, with females (M = 37, SD = 6.18) having higher scores than males (M = 33, SD = 5.57). Also, there was a significant difference between genders on Emotionality, F (1,196) = 3.87, p = 0.05, with females (M = 27, SD = 4.67) having higher scores than males (M = 26, SD = 4.21). There was a significant effect of gender on Extraversion, F (1,196) = 5.27, p = 0.02, with females (M = 20, SD = 3.69) having higher scores than males (M = 19, SD = 3.36).There was a significant effect for gender on Conscientiousness, F (1,195) = 7.01, p = 0.01, with females (M = 25, SD = 4.24) having higher scores than males (M = 23, SD = 4.11).There was a significant effect for gender on Openness to Experience, F (1,192) = 26.60, p = .001, with females (M = 14, SD = 2.81) having higher score than males (M = 12, SD = 2.95). Genders differed in terms of flow, F (1,182) = 9.74, p = 0.002, where females (M = 45, SD = 8.01) had significantly higher scores on flow compared to males (M = 41, SD = 8.90). Genders also differed with regard to flow state, F (1,177) = 12.89, p = .001 where females (M = 129, SD = 11.87) had significantly higher scores on flow state compared to males (M = 121, SD = 16.82). There was significant difference between genders on dispositional flow, F (1,191) 17.19, p = .001; Females (M = 121, SD = 13.68) had significantly higher scores on dispositional flow compared to males (M = 113, SD = 15.79). There was no significant difference between genders on Agreeableness dimension of personality, F (1,191) = 1.20, p = 0.17.

Table 2
Personality predictors of flow

Variable	Unstandardized Coefficients		Standard Coefficients	t	Sig.
	B	Std - Error	Beta		
Gender	2.57	1.42	0.15	1.81	0.07
Honesty-Humility	0.07	0.11	0.05	0.69	0.49
Emotionality	-0.06	0.14	-0.03	-0.43	0.67
Extraversion	0.66	0.18	0.28	3.68	.001
Agreeableness	0.19	0.32	0.04	0.59	0.56
Conscientiousness	0.20	0.15	0.10	1.31	0.19
Openness to Experience	0.10	0.22	0.04	0.45	0.65

R^2 = 0.18, Adjusted R^2 =0.15, F (7,159) = 5.07, p = .001

Table 2 presented above shows the multiple linear regression carried out to identify the personality predictors of flow. As may be seen from the table above, Extraversion positively predicted flow which accounted for 18% of the variance in flow. Honesty-Humility, Emotionality, Agreeableness, Conscientiousness, and Openness to Experience did not predict flow. Gender also did not significantly predict flow.

Table 3
Personality predictors of flow state

Variable	Unstandardized Coefficients		Standard Coefficients	t	Sig.
	B	Std. Error	Beta		
Gender	1.72	2.56	0.06	0.67	0.50
Honesty-Humility	0.38	0.19	0.15	2.00	0.05
Emotionality	0.12	0.26	0.03	0.44	0.66
Extraversion	1.05	0.31	0.25	3.41	0.001
Agreeableness	-0.07	0.56	-0.01	-0.13	0.90
Conscientiousness	0.67	0.28	0.18	2.42	0.02
Openness to Experience	0.77	0.39	0.16	2.00	0.05

R^2 = 0.25, Adjusted R^2 =0.22, F (7,155) = 7.50, p = .001

As may be seen from the above, Honesty and Humility, Extraversion, Conscientiousness, and Openness to Experience positively predicted flow state. These factors accounted for 25% of the variance in the flow state. The factors Emotionality and Agreeableness did not predict the flow state. Gender also did not significantly predict flow state.

Table 4
Personality predictors of dispositional flow

Variable	Unstandardized Coefficients		Standard Coefficients	t	Sig.
	B	Std. Error	Beta		
Gender	4.27	2.51	0.14	1.70	0.09
Honesty and Humility	0.01	0.19	0.00	0.04	0.97
Emotionality	0.13	0.27	0.04	0.51	0.61
Extraversion	0.92	0.32	0.21	2.89	0.001
Agreeableness	-0.67	0.58	-0.08	-1.17	0.25
Conscientiousness	0.64	0.27	0.17	2.36	0.02
Openness to Experience	0.89	0.39	0.18	2.26	0.03

$R^2 = 0.21$, Adjusted $R^2 = 0.17$, $F(7,164) = 6.15$, $p = .001$

As may be seen from the table above, Extraversion, Conscientiousness, and Openness to Experience positively predicted dispositional flow. These factors accounted for 21% of the variance in the dispositional flow. Honesty-Humility, Emotionality, and Agreeableness did not predict the dispositional flow. Gender also did not significantly predict dispositional flow.

Discussion

The findings of the present study show that significant gender differences exist with regard to personality and flow. In this study, females were higher on Honesty-Humility, Emotionality, Extraversion, Conscientiousness, and Openness to Experience. This is in line with another study (Babarović & Sverko, 2013) that reported females scoring higher than males on Honesty-Humility, Emotionality, and Openness to Experience, while males scored higher on Agreeableness dimension. Societal influences could explain why women score higher than men on Honesty-Humility and Emotionality (Goodwin & Gotlib, 2004).

Honesty-Humility trait is characterized by a tendency to be sincere and fair, avoiding greed, and being modest (Ashton & Lee, 2008). Individuals who are low on Honesty-Humility tend to make use of others and engage in deceiving, cheating and manipulating for personal gains (Lee et al., 2010; Marcus et al., 2007). Men are more likely to fortify their status and influence compared to women (Palamoki et al., 2016). This could be one possible explanation for why men score less than women on Honesty-Humility. The differences between men and women on social value orientation could also explain the gender differences seen in the Honesty-Humility dimension of personality where women are found to be more honest than men (Grosch & Rau, 2017). Females are also often found to be high in need for affiliation that often makes them expressive, nurturing, and polite, and men are often found to be achievement oriented that makes them assertive, power hungry, and independent (Basow & Rubenfeld, 2003; Stevanovic et al., 2019). This could explain the differences seen between men and women on Honesty-Humility in this study.

Emotionality refers to being vulnerable, sentimental, and fearful. Studies have found females to be higher than males on anxiety (Feingold, 1994). Many studies that have used self-report measures have reported that women compared to men were highly emotionally responsive (Birditt & Fingerman, 2003; Lucas & Gohm, 2000; Thayer et al., 2003). This is, however, not consistently supported by studies that have used psychophysiological measures (Katkin & Hoffman, 1976; Kelly et al., 2008; Vrana & Rollock, 2002). Thus, the differences in Emotionality seen in this study may simply be a reflection of beliefs regarding Emotionality held by different genders. Women, in general, compared to men are found to be more emotional (Bradley et al., 2001; Kring & Gordon, 1998). During adolescence, girls but not boys tend to become prone to negative affects (Agam et al., 2015; Deng et al., 2016; Rudolph, 2002; Van den Akker et al., 2014). Further, it is more acceptable for women in traditional society compared to men to express their emotions. This is more so in a patriarchal society when men are expected to be 'stoic' without expressing their emotions openly as an indication of being strong. This could explain the differences seen between men and women on Emotionality in this study.

In the present study, we find women scoring higher on Extraversion compared to men. According to Baiocco et al. (2017), extraversion is characterized by social boldness while interacting with others in groups, being positive, secure, and self-assured with regard to social ability. There are mixed findings on the differences between genders on Extraversion. In some studies, females were more extraverted than males (Feingold, 1994; Goodwin & Gotlib, 2004; Mac Giolla & Kajonius, 2018; Rahmani & Lavasani, 2012; Weisberg et al., 2011) while a few other studies report that males were more extraverted than females (Shokri et al., 2007). These differences are attributed to several factors like evolutionary bases, social roles where women are encouraged and expected to be warm, gregarious, and display positive affect (Costa et al., 2001; Eagly, 2009; Feingold, 1994) all of which are characteristics of Extraversion.

The present study found that women scored higher than men on Conscientiousness. This is in line with a few other studies. Females compared to men are higher on order, dutifulness, and self-discipline, all of which are aspects of Conscientiousness (Costa et al., 2001; Duckman & Seligman, 2006; Feingold, 1994). In some studies, females scored higher on Conscientiousness than males (Bashiri et al., 2011; Goodwin & Gotlib, 2004; Risse et al., 2018; Schmitt et al., 2008) with a few others reporting that males scored higher than females on this dimension (Shokri et al., 2007).

Women were found to be higher on Openness to Experience compared to men in the present study. This is in contradiction to the findings of previous studies that report men as having more Openness to Experience than women (Golabdar et al., 2016; Goodwin & Gotlib, 2004; Shokri et al., 2007) or that there is no gender difference with regard to Openness to Experience (Costa

et al., 2001). Individual facets of openness were found to be related differentially to gender (Weisberg et al., 2011). Adolescent girls are encouraged to be conservative and are often restricted by structure and routine in traditional societies. The adolescent girls' high scores on Openness to Experience may be reflecting their reaction to the constraints posed by societal restrictions. Thus, they may hence be more interested and curious to try new things that are not supported in society.

In the present study, no significant difference was found between men and women on Agreeableness. This is in line with a few studies that also report no gender difference in Agreeableness (Rey & Extremera, 2016). Women were higher than men on altruism, a facet of Agreeableness (Bashiri et al., 2011). Women were higher than men on trust and tender-mindedness (Feingold, 1994). Women are encouraged and expected to be nurturing and tender-minded (Feingold, 1994; Costa et al., 2001). Women were reported to be more agreeable than men (Chapman et al., 2007; Rahmani & Lavasani, 2012; Schmitt et al., 2008). Cultural differences in the socialization process can explain the gender difference in Agreeableness (Feingold, 1994; Magan et al., 2014; Shuqin et al., 1995; Weisberg et al., 2011). For adolescents, peer approval is very critical. It is, hence, important for both boys and girls during adolescence to get along with others avoiding confrontation. In order to maintain their interpersonal relationships, they may try to be unassuming and humble. They are candid and frank, and try to be uncompromising in voicing their opinion. Thus, the findings of the present study point out the fact that Agreeableness is equally important to both boys and girls during adolescence. It will be interesting to examine how different facets of Agreeableness vary across genders.

The findings of the present study show that adolescent females were higher on flow state as well as dispositional flow, and tend to experience greater levels of flow compared to males. Hsieh et al. (2013) study found that female adolescents had greater flow experiences than men in the mini-educational game conducted. The level of total flow experience is reported to be higher in women than in men in aspects like clarity of goals, the immediateness of the feedback, level of task absorption, and in the balance between skills and perceived challenges of the task (Magyaródi & Oláh, 2015). Some studies have found that gender has no effect on flow (Mao, 2016; Martin & Cutler, 2002; Russell, 2001) while others report males as having greater flow experience than females (Voiskounsky & Wang, 2014). Dispositional flow score was either found to be higher in male athletes than female athletes (Liu et al., 2015), or no gender difference was found in general dispositional flow (Murcia et al., 2008). Gender differences in flow can be because females perceive task-oriented climate whereas males perceive an ego-oriented climate (Murcia et al., 2008). Since greater task orientation is necessary to attain flow, females are more likely to attain flow than males.

The present study found that Extraversion positively predicted overall flow experience, flow state, and dispositional flow. Individuals who are high in Extraversion are often in need of social stimulation and prefer to utilize the chance of communicating with others. Such people are often characterized as being full of life, cheerfulness, and enthusiasm, and are often seeking novelty and excitement. All these characteristics are associated with flow activities as well. This is in line with a study that reported a significant relationship between extraversion and flow with people high on extraversion more likely to experience flow than people with low extraversion scores (Heller et al., 2015). Leibovich et al. (2013) also observed that adolescents who scored high on the scale of flow state were also high on Extroversion.

The findings of the present study show that Honesty-Humility is a positive predictor of the flow state. Those high on Honesty-Humility are sincere, fair, unselfish, and modest. They are open to feedback without being judgmental, receptive to trying out new things that may or may not lead to success, and learn from them (Nana, 2016). People who are high on Honesty-Humility engage in risk-taking behavior (Weller & Thulin, 2012) which is essential for experiencing flow. People who have Honesty-Humility accept themselves as it is, and accept any information about the self that is often experienced as feedback from others irrespective of whether or not it preserves their expectations. Thus individuals high on the Honesty-Humility dimension have a realistic self-perception and because it represents an honest interpretation of the self, it is a vital ingredient of flow.

The findings show that Conscientiousness positively predicted flow state and dispositional flow. Those with personality traits of Conscientiousness love their work and are committed to their work. Conscientiousness reflects the desire to work hard in an efficient and organized manner. Conscientious people tend to be disciplined and are thorough with the details. Flow experience requires an optimal balance of challenge in the task and one's abilities. Those high on Conscientiousness may choose work that is challenging and work towards optimizing their abilities to achieve it. Thus, Conscientiousness can contribute to flow experience (Demerouti, 2006). Two traits, Conscientiousness and dispositional flow would be positively related to one another chiefly because several characteristics such as intrinsic motivation, problem-solving and positive affect that are linked to dispositional flow are also associated with Conscientiousness (Hager, 2015).

The findings of the present study show that Openness to Experience predicted flow state and dispositional flow positively. Openness involves six facets, or dimensions, including intellectual efficiency, ingenuity, curiosity, aesthetics, tolerance, and depth (Woo et al., 2013). Those who are high on Openness to Experience are also high on creativity. All these are related to flow experience. Autotelic personality also includes characteristics such as curiosity, persistence, and intrinsic motivation (Tse et al., 2018). The commonality in these characteristics indicates that Openness to Experience may be a trait constituting autotelic personality. An interesting finding of the study is that though the gender differences in flow was significant, the gender no longer was a significant predictor of flow when personality factors were included in the model. This implies that personality factors chiefly contribute to the variance in flow.

Lack of a sample drawn from a more diverse population poses limitations on the extent to which the findings of the present study can be generalized. The study exclusively relied on self-report measures. Using multiple sources of data could provide better insight into the phenomena studied. Experience sampling methods could provide interesting information about the participants that is essential to understand the experience of flow.

The present research supports continued exploration into how personality factors affect flow. The finding that personality factors and flow experiences are related strongly suggests that people possessing certain personality traits may be more likely to

experience flow than others, and hence personality development programs can improve individuals' likelihood of experiencing flow.In order to achieve better generalizability, further research should include samples from a more diverse population. Further research should be carried out that investigates the role of other demographic variables such as age, ethnicity, location, level of education, etc., in the relationship between personality and flow. Interestingly, the Experience Sampling method can provide a vital extension to future research as it provides insight into the levels of skills and challenges seen in adolescents which according to Csikszentmihalyi (1990) are found to be higher at their schooling period over the various stages of their life.

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