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# Grit as a Predictor of Adolescents' Mobile Phone Addiction

Mobile phone addiction is defined as a behaviour addiction that consists of human-machine interaction and non-chemical behaviour (Griffiths, 1996). Certain personality types are more likely to have the problems of mobile phone addiction. Some studies have examined the relationships between the 'big-5' personality traits (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism) and mobile phone addiction, and found that extraversion and disagreeableness were significant predictors of mobile phone use, where disagreeable people reported greater mobile phone use for calls and instant messaging (Butt and Phillips, 2008; Ehrenberg *et al.*, 2008). In addition, extraversion and openness-to-experience were significant predictors of mobile phone addiction (Andreassen *et al.*, 2013; Takao, 2014). Moreover, young adults who have a higher score in materialism and impulsiveness are also found to be more addicted to cell phone and instant messaging (Roberts and Pirog, 2012). This article aims to examine the relationships between grit and mobile phone addiction. Grit is defined as a passion and perseverance for long-term goals (Duckworth *et al.*, 2007), and is thought to be a personal quality that exists in successful people. Grittier individuals are able to keep their stamina to reach their goal over years, even though they may have many negative experiences in the progress of chasing goals, such as failure, adversity and plateaux.

When compared with others of equal intelligence, grittier individuals are more likely to accomplish their goals. Therefore, grit is regarded as a more important psychological trait for success than intelligence quotient (IQ), as grit can always translate into achievement but IQ may not. The

main difference between grit and conscientiousness or self-control is that with grit the emphasis is on long-term stamina rather than short-term intensity (Duckworth *et al.*, 2007).

Two factors are extracted from the 12-item grit scale, which are consistency of interests and perseverance of effort. Each factor consists of 6 items and have found to have high internal consistency. Perseverance of effort measured commitment and effort toward one's goals; it includes items such as "finish whatever I begin". Consistency of interest measured the extend of focus and dedication to a small set of important goals; it includes items such as "new ideas and projects sometimes distract me from previous ones" (reversed) (Duckworth *et al.*, 2007).

A short grit scale that consisted of 8 items was developed after, and the factor of perseverance was found to positively associated with Grade Point Average (GPA) and extracurricular activities, but negatively associated with television watching, and the factor of consistency was found negatively associated with career changes (Duckworth and Quinn, 2009).

It is expected that grittier people are less likely to become addicted to mobile phone use as the addiction will influence their persisting efforts in pursuit of long-term goals. Therefore, it is expected to find a significant negative association between grit and mobile phone addiction in this study. To our knowledge, no study has explored this relationship.

Since adolescents were reported to have a higher tendency to be addicted to mobile phone use (Ehrenberg *et al.*, 2008), they were recruited as a sample in this study. The results of this report would provide information to programmers and educators in their design of prevention strategies

for mobile phone addiction among adolescents.

## Methods

Two hundred and fourteen secondary students at a secondary school were recruited to participate in this survey. About 40% were from Year One, 30% from Year Two and 30% from Year Three. About half of them were males (48.1%). Their mean age were 13.08 ( $SD = 0.83$ ) and the mean time of using mobile phone is about 4.5 hours per day ( $SD = 3.09$ ). Purposive sampling was used to select participants, so that only Year One to Year Three students were invited to participate. A questionnaire was then distributed to those students who agreed to participate in the study, which took about 10 minutes for them to complete. At the first measurement, participants were asked to fill in some background information, such as gender, age, and level of study. At the second measurement, participants needed to answer the Short Grit Scale (Grit-S) that contains eight items was used to measure grit on a 5-point scale (1 = not like me at all, 5 = very much like me). Four items describe the tendency toward sustained effort for long-term goals, and four other items describe abiding and focused interests over time (Duckworth and Quinn, 2009). In this study, the Cronbach's alpha reliability for the overall grit scale was 0.73, for the perseverance effort subscale was 0.78 and for consistency of interest subscale was 0.69. At the third measurement, participants were asked to fill in the mobile phone addiction index (MPAI) (Leung, 2008), which is a measurement that is developed from samples in Hong Kong. The MPAI is a scale that was based upon Young's diagnostic questionnaire for Internet addiction (Young, 1998) and was derived from the mobile phone problem usage scale (Bianchi and Phillips, 2005). The MPAI contains 17 items and each item is scored along a five-point Likert scale, ranging from not at all (1) to always (5). In this study, the Cronbach's alpha reliability of overall scale was 0.89. The Cronbach's alpha of subscales were 0.79 for productivity loss, 0.75 for anxiety and feeling lost, 0.81 for withdrawal and escape, and 0.71 for inability to control craving. The completed questionnaires were then collected and all the data were keyed in and analysed using the Statistical Package for the Social Sciences (SPSS) software. Pearson correlation was used to examine the relationships between grit and mobile phone

addiction, and then multiple regression analyses were run to find out the significant predictors of grit on mobile phone addiction and whether gender was a moderator of the relationship between grit and mobile phone addiction.

## Findings

### Grit and mobile phone addiction

Pearson correlations showed that grit was negatively correlated with mobile phone addiction ( $r(212) = -0.39, p < 0.001$ ), and with all four factors of mobile phone addiction (all at  $p < 0.01$ ) (see Table 1). Consistency of interest was also negatively correlated with mobile phone addiction and all four factors of mobile phone addiction (all  $p < 0.001$ ). Nonetheless, perseverance of effort was only negatively correlated with productivity loss ( $r(212) = -0.16, p = 0.001$ ).

Table 1: The relationships between grit and mobile phone addiction

	Grit	Consistency of interest	Perseverance of effort
<b>Mobile phone addiction</b>	-0.388***	-0.49***	-0.124
<b>Productivity loss</b>	-0.406***	-0.482***	-0.158*
<b>Feelings anxious and lost</b>	-0.246***	-0.339***	-0.051
<b>Withdrawal/escape</b>	-0.229**	-0.290***	-0.073
<b>Inability to control craving</b>	-0.246***	-0.322***	-0.069

Note: \*  $p < 0.05$  \*\*  $p < 0.01$  \*\*\*  $p < 0.001$

Multiple regressions were then used to further examine the relationships between grit and mobile phone addiction. By entering consistency of interest and perseverance of interest as independent variables, ages and gender as control variables, and mobile phone addiction as dependent variables, the results revealed that consistency of interest ( $\beta = -0.45, t = -7.36, p < 0.001$ ), but not perseverance of interest ( $\beta = 0.036, t = 0.58, p = 0.566$ ), was a significant predictor (inversely) of mobile phone addiction ( $F(4, 206) = 18.26, p < 0.001$ ) (see Table 2).

Table 2: The results of multiple regression of grit on mobile phone addiction

	Mobile phone addiction			
	B	Beta ( $\beta$ )	t	p
<b>Grit</b>				
Consistency of interest	-0.388	-.453	-7.361	< 0.001
Perseverance of effort	0.031	.036	.575	.566
<b>Demographic characters</b>				
Gender	0.203	.151	2.436	.016
Age	0.095	.135	2.237	.026
<b>R Square</b>	0.26			
<b>F (4, 206)</b>	18.26			
<b>p</b>	< 0.001			

## Discussion

As expected, the results of Pearson correlation showed that grit is negatively associated with mobile phone addiction. In other words, individuals who have a strong passion and perseverance for long-term goals are less likely to be addicted to mobile phone use. Grittier people are more likely to control their use of mobile phone, less likely to feel that the use of the mobile phone has caused problems in their lives or decreased their productivity, or to feel anxious or lost. In addition, grittier people are also less likely to use mobile phone as a way to escape from loneliness, feeling down or isolation.

However, among the two factors of grit, only consistency of interest was associated with mobile phone addiction (inversely) but not perseverance of effort. A possible explanation can be found in a study that compares the different drives related to perseverance of effort and consistency of interest (Culin *et al.*, 2014). The study found that both factors are relevant to the drive of pursuing engagement and meaning, but only consistency of interest is relevant to the drive toward immediate pleasure. Accordingly, since most participants in this study used mobile phone mainly for entertaining purposes, such as listening to music, surfing the internet and playing games, consistency of interest is more effective than perseverance of efforts in resisting the immediate pleasure brought by the multi-functions of mobile phone.

In conclusion, the findings showed that grittier adolescents are less likely to be addicted to mobile phone use. However, only those adolescents who are strong in consistency of interest are likely to resist the immediate pleasure brought by mobile phones. Besides this, gender is not a moderator of the relationships between grit and mobile phone addiction.

Based on the results, educators or parents should find strategies to train students or children to learn and to form a strong trait of consistency of interest. Therefore, more studies should be conducted to find out the formation of a gritty personality. Besides, future studies may consider examining the relationship of mobile phone addiction with hardiness, as hardiness is found to be a better predictor for more different types of addiction, such as problematic Internet usage and compulsive buying (Maddi *et al.*, 2013). In addition, more cross-cultural studies can be conducted to examine whether the results can be generalized to other populations or not.

### Author note

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