

The passion scale: Aspects of reliability and validity of a new 8-item scale assessing passion.

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ABSTRACT

In this article, the psychometric properties of a new scale aimed at quantifying passion are explored, i.e. passion related to becoming good or achieving in some area/theme/skill.

The Passion Scale was designed to be quantitative, simple to administer, applicable for large-group testing, and reliable in monitoring passion.

A total of 126 participants between 18 and 47 years of age (mean age = 21.65, SD = 3.45) completed an assessment of Passion Scale, enabling us to investigate its feasibility, internal consistency, construct validity and test-retest reliability.

Feasibility: The overall pattern of results suggest that the scale for passion presented here is applicable for the age studied (18–47).

Internal consistency: All individual item scores correlated positively with the total score, with correlations ranging from 0.51 to 0.69. The Cronbach's alpha value for the standardized items was 0.86.

Construct validity: Pearson correlations coefficient between total score passion scale and Grit-S scale were 0.39 for adults, mean age 21.23 (SD = 3.45) (N = 107).

Test-retest reliability: Intraclass correlation coefficient (ICCs) between test and retest scores for the total score was 0.92.

These promising results warrant further development of the passion scale, including normalization based on a large, representative sample.

1. Introduction

‘Don't just fill the basket, but light the fire’

When becoming very knowledgeable about or skillful in a particular area, there is no doubt about the importance of training and experience (Thelen & Smith, 1994). In this respect, Ericsson, Prietula, and Cokely (2007) point out that experts are always made, not born. The authors further argue that to become an expert you need deliberate practice over several years, or 10,000 h of focused training. In this context, one could argue that to become expert you need a lot of training through many years in the area you want to be expert in (Ericsson & Charness, 1994; Ericsson et al., 2007; Sala & Gobet, 2017; Sigmundsson, Trana, Polman, & Haga, 2017).

Which factors make some individuals willing to practice and train enough to become experts? When analyzing what characterizes

individuals who can be said to be experts, *passion* (much interest) for the area you are going to be expert in are of importance (Sigmundsson & Haga, 2019). As Curran, Hill, Appleton, Vallerand, and Standage (2015) point out, passion provides the psychological energy underpinning engagement in valued activities. You also need to have *grit* or perseverance to be able to carry out so much practice for such a long time (Duckworth, 2016). *Growth mindset* is probably an important underlying cognitive factor for grit and passion (Dweck, 2017). In addition, the importance of follow-up and support from a good mentor/teacher or trainer for the person is indisputable (Ericsson et al., 2007). For an overview of these factors, see Fig. 1.

1.1. Passion

Passion can be explained as an intense desire or enthusiasm for

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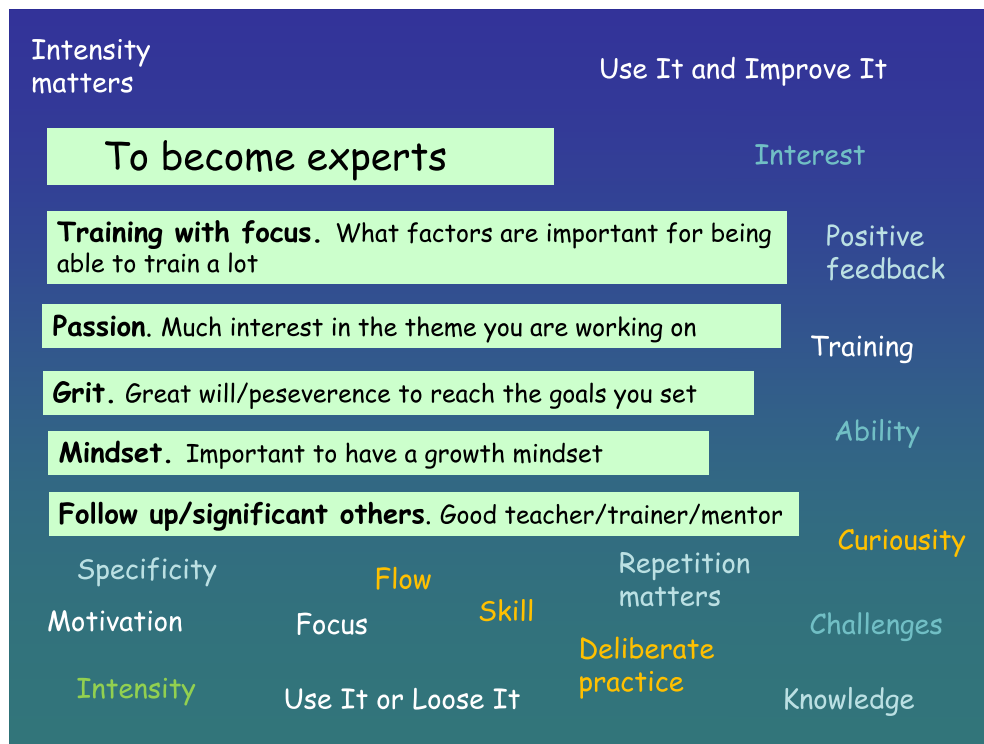


Fig. 1. Different factors of importance for becoming experts.

something (Oxford University Press, 2019). Jachimowicz, Wihler, Bailey, and Galinsky (2018) define passion as a strong feeling toward a personally important value/preference that motivates intentions and behaviors to express that value/preference. The presence of a strong feeling indicates that passion is an intense affective state. They argue that passion produces beneficial effects on performance through a key mechanism: immersion (deep mental involvement in something) (Jachimowicz et al., 2018, p. 9981). In general, passion is described as “something” that drives us. It could be a motivation behind an action, or dedication and enthusiasm towards a specific object, activity, concept or a person. Passion, by being connected to strong affections such as liking and love, results in time and energy investment on a regular basis, and is associated with a person's identity (Vallerand, 2016).

The history of “passion” has shown two distinct perspectives. Early philosophers such as Plato and Spinoza describe passion as a loss of reason and control, and as something that can lead to an experience of suffering. This is consistent with the origin of the term, “passio”, the latin for suffering (Vallerand, 2016, p. 32). According to this perspective, passion leads to unacceptable thoughts, and it controls people, making them passive slaves with no control. In contrast, the other perspective has a more positive view on passion and suggests it can lead to benefits when controlled by the individual. In this context, Descartes defines passion as a strong emotion which, if underlined by reasoning, can lead to positive behavioral tendencies. Furthermore, Hegel argues that passion is necessary to reach the highest level of accomplishment, and Rousseau states that passion can prompt knowledge and truth (Vallerand, 2016).

In 2003, Vallerand et al. introduced the Dualistic Model of Passion (DMP), based on Self-determination Theory (Vallerand et al., 2003; Vallerand, 2008, 2010, 2015). The model states that passion is about having a strong tendency towards an activity, and due to the importance and affection attached to it, time and energy is spent in order to satisfy the psychological need for autonomy, competence and relatedness. Hence, passion is a strong need for action in a specific direction (Vallerand, 2010). The devotion to the activities and the time spent on them, will eventually lead to them being an important part of the

individual's identity and life (Vallerand, 2010). The DMP divides passion into two different types: harmonious passion (HP) and obsessive passion (OP). Harmonious passion is characterized by controllable action and is seen as an autonomous internalization of activity, meaning that the activity is seen as significant and motivational for the individual. Hence, HP is in harmony with other aspects of life and experienced as a positive. In contrast, obsessive passion is defined as an uncontrolled desire for action, in which the individual is unable to see the consequences of his or her activity. The passion controls the individual, and for that reason, OP may be associated with conflicts and negative emotions, such as frustration, exhaustion and even health problems (Vallerand, 2016).

Passion may be considered as domain-specific, such as passion for work or hobbies (Bonneville-Roussy, Lavigne, & Vallerand, 2011) and provide individuals with the focus necessary to achieve their goals (Duckworth, Kirby, Tsukayama, Berstein, & Anders Ericsson, 2011). In this respect, Jachimowicz et al. (2018) state: “... highly persevering individuals achieve success only when pursuing goals they are passionate about” (p. 9981). In this context, the research group for Learning and Skill Development has developed a scale to quantify passion. As studies investigating passion are limited, the development of the scale was based on both empirical and anecdotal evidence. Theoretical perspectives on development and learning (Edelman, 1987, 1992; Ericsson et al., 2007; Gottlieb, 1998; Thelen & Smith, 1994) emphasize the importance of experience, practice and specificity in order to become skilled. Some of the test items are therefore designed to try to reveal the involvement, commitment and effort that individuals display toward a very important value/preference. The scale also measures mental and psychological conditions such as positive attitude, intrinsic motivation and positive self-perception, as research finds them as antecedents for the development and learning of skills and competence (Deci & Ryan, 2008; Ericsson et al., 2007). Furthermore, this work integrates applied and anecdotal evidence based on the experiences and observations of experts in their field, namely excellent athletes, artists and scientists. The passion scale mainly focuses on the passion for achievement or becoming good in some area/theme/skill. The scale is a self-reported

questionnaire with 8 items focusing on the passion a person has for an area/theme/skill, for example: 'I have an area/theme/skill I am really passionate about'. The items are rated on a Likert scale, ranging from 1 to 5 (1 = not at all like me, 5 = very much like me). The scale is based on Jachimowicz et al.'s (2018) definition of passion as a strong feeling toward a personally important value/preference that motivates intentions and behaviors to express that value/preference. In this article, we report on the development of a new scale aimed at the objective quantification of passion. The principle aim of this study was to examine the applicability of the 8-item scale, its internal consistency and construct validity, as well as test-retest reliability in a sample of participants between the ages of 18–47 years.

2. Method

126 subjects participated in the study. The average age in the group was 21.65 (SD = 3.45). The average age of the female group was 21.67 (SD = 2.77) and the male group 21.64 (SD = 4.22). All the 126 subjects answered the passion scale questions and 107 of the participants also conducted the Grit-S questions (the construct validity part of the study). Recruitment was conducted among university students from Reykjavik University, Iceland.

2.1. Measurements

2.1.1. Demographics

The participants indicated their age, gender and educational level.

2.1.2. Procedure

The study was performed in accordance with the Declaration of Helsinki. Passive consent from the participants was confirmed to be sufficient from the Icelandic Data Protection Authority, because no sensitive personal data were collected. The information registered about the participants was anonymous (only age and gender). The Passion Scale was developed in the research group for Learning and Skill Development. The questions and the first version of the scale were tried out in a pilot study. After some language corrections, the scale was ready for use in a larger sample. Assessment of the participants took place in a quiet room at the university campus. All testing was performed in a group setting (during the normal school hours). A trained experimenter explained the procedure and was present when the questionnaires were conducted. For the test-retest part of the study, 21 adults (mean age = 23.66 years, SD = 2.41) were tested twice, 1 week apart.

2.2. Measures

2.2.1. Passion

The Passion Scale was used to assess the participants' level of passion for achievement. The participants rated eight items, using the scale of 1 = not like me at all to 5 = very much like me. The 5-point Likert scale is one of the most common (Likert, 1932) and was used for possible comparison to other important factors related to passion. For an overview of the 8-items, see Table 1. The maximum score on this scale is 5 (extremely passionate) and the lowest is 1 (not at all passionate).

2.2.2. Grit

Duckworth, Peterson, Matthews, and Kelly (2007) defined grit as perseverance and passion for long-term goals (p. 1087). Grit S, short grit scale (Duckworth & Quinn, 2009) and the Norwegian version (Sending, 2014) were used to assess the participants' level of grit. The participants rated eight items, using a 5-point Likert scale with items rated in terms of how much the item was "true" for the respondent (1 = not like me at all and 5 = very much like me). The measure included two subscales of four items each: Consistency of Interest (COI) and Perseverance of Effort (POE). A sample item for COI is 'I often set a

Table 1

The eight passion scale questions.

Passion Scale Questions
1. I have an area/theme/skill I am really passionate about
2. I would like to use a lot of time to become good in that area/theme/skill
3. I think I could be an expert in one area/theme/skill
4. I have passion enough to become very good in the area/theme/skill I like
5. I work hard enough to fulfill my goals
6. I have a burning passion for some areas/themes/skills
7. I use lot of time on the projects I like
8. My passion is important for me

goal but later choose to pursue a different one' (reverse-scored) and for POE, 'I finish whatever I begin'. The maximum score on this scale is 5 (showing extreme grit), and the lowest score 1 (no grit at all). Grit-S showed good internal consistency several times, $\alpha = 0.82$ and $\alpha = 0.84$ (Duckworth & Quinn, 2009, p. 170). The study provided evidence for the predictive validity, consensual validity, and test-retest stability of Grit-S.

2.2.3. Data reduction and analysis

The data were analyzed in SPSS (version 25). To estimate the internal consistency of the test items, Cronback's alpha value for the test was calculated. In addition, an analysis of correlation (Pearson's r) between the different questions and the total score was calculated. When an individual question score was correlated with the total score, the individual question score was excluded from the total score to avoid statistical dependence. The construct validity of a test can be established by comparing it with a prior test known to be valid: a so-called gold standard. For passion, no such gold standard is available. Nevertheless, to obtain an estimate of the construct validity we correlated the total test score passion scale with the Grit-S total score. The relative test-retest reliability of the test was estimated by using intraclass correlation coefficients (ICC) (2,1) (Shrout & Fleiss, 1979) between test and retest scores for total scores and individual item scores.

3. Results

3.1. Demographic differences

As a first step, we explored demographic differences among the variables of interest. Age had no significant correlation with mean total score passion $r = -.15$ (Pearson correlation). There was no significant difference in terms of gender: the females had a total score on passion of 4.08 (SD = 0.58) and the males 4.26 (SD = 0.52).

3.2. Feasibility

The means and standard deviations for the eight questions in the Passion Scale are shown in Table 2.

Table 2

Mean and standard deviations for the eight passion scale questions (N = 126).

	Mean	SD
Question 1	3.78	.95
Question 2	4.12	.81
Question 3	4.30	.71
Question 4	4.23	.75
Question 5	4.05	.81
Question 6	4.00	.84
Question 7	4.29	.73
Question 8	4.16	.56

Table 3

Pearson correlation coefficients and 95% confidence intervals for individual questions score and total test score^a and Pearson coefficients for individual test items.

	Correlation			Correlation with:							
	with total score	95%	CI	1	2	3	4	5	6	7	8
Question 1	.51	.39,	.63	1	.60**	.30**	.34**	.35**	.37**	.27**	.39**
Question 2	.53	.39,	.66		1	.42**	.38**	.27**	.41**	.22*	.37**
Question 3	.64	.52,	.73			1	.67**	.40**	.53**	.44**	.47**
Question 4	.69	.57,	.78				1	.49**	.53**	.52**	.53**
Question 5	.56	.42,	.68					1	.40**	.46**	.52**
Question 6	.66	.53,	.76						1	.54**	.53**
Question 7	.60	.48,	.67							1	.59**
Question 8	.68	.56,	.78								1

Note. CI = Confidence interval.

*Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

^a On the basis of the other 7 item scores.

3.3. Internal consistency

All individual items (see Table 3) correlated positively with the total score, with correlation ranging from 0.51 to 0.69. Correlations between scores on the individual questions were moderate to high (0.22-0.67). The Passion Scale showed good internal consistency with Cronbach's alpha value of 0.86.

3.4. Construct validity

The Pearson correlation coefficient between total score Passion Scale and Grit-S scale was 0.39 for adults (mean age = 21.23, SD = 3.45, n = 107) (see Fig. 2).

3.5. Test-retest reliability

The Passion Scale showed good test-retest reliability. Table 4 shows the means and standard deviation of test and retest scores. ICCs between test and retest scores ranged from 0.54 to 0.89. ICCs between test and retest total scores was 0.92 (n = 21, mean age 23.67, SD = 2.41).

Table 4

Means and standard deviations of test and retest scores (N = 21).

	Test score		Retest score		ICC
	M	SD	M	SD	
Question 1	4.14	(.79)	4.28	(.71)	.889
Question 2	4.14	(.65)	4.38	(.59)	.538
Question 3	3.90	(.99)	4.00	(.63)	.670
Question 4	3.95	(.74)	3.90	(.70)	.725
Question 5	4.09	(.83)	4.14	(.73)	.775
Question 6	4.00	(.89)	3.81	(.81)	.859
Question 7	4.04	(.59)	4.05	(.59)	.832
Question 8	4.57	(.68)	4.29	(.46)	.554
Total score	4.10	(.50)	4.10	(.44)	.920

Note, ICCs = intraclass correlation coefficients; CI = confidence interval.

4. Discussion

This study describes and examines the psychometric properties of the Passion Scale, a new scale that attempts to quantify passion for achievement or being good in an area/theme/skill. In the first round of testing, the scale was administered to 126 adults, allowing us to explore its feasibility, internal consistency, construct validity and test-retest

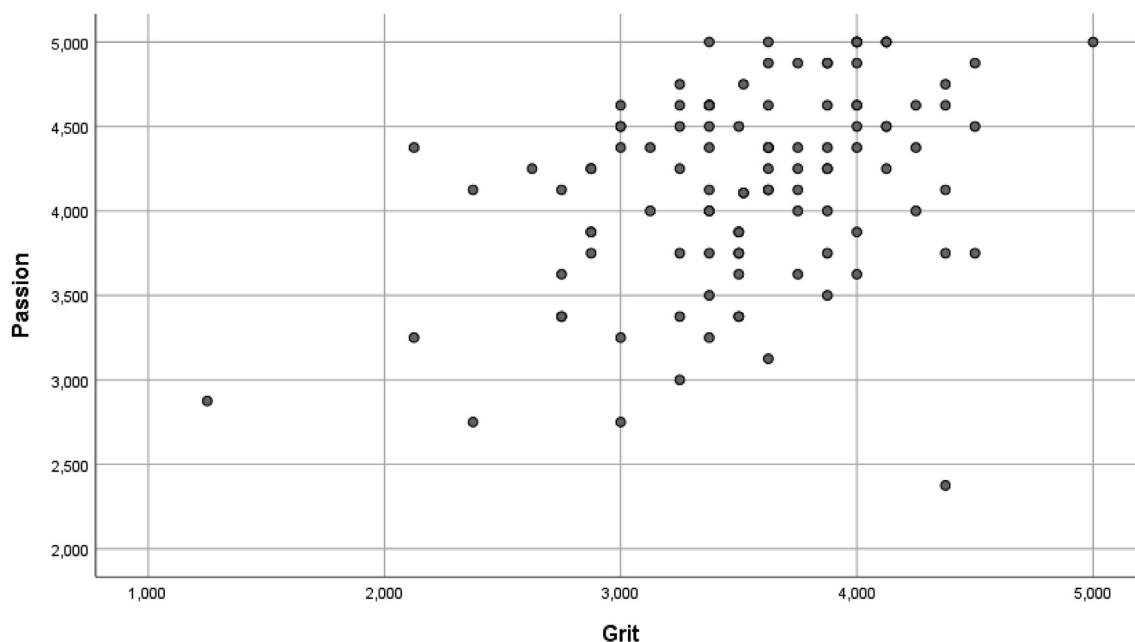


Fig. 2. Correlations between passion and grit.

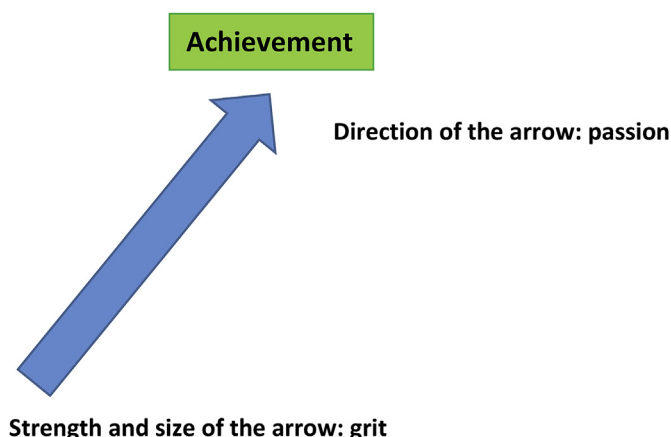


Fig. 3. Passion and grit are intertwined constructs that both are needed for high achievement (become an expert). Passion is the direction to an area/theme/skill and grit is the strength and size of the arrow.

reliability.

Feasibility: The results indicate that the scale is applicable for the age-range (18–47) studied. Further studies are being carried out to widen the age range from adolescents to older adults (from 13 to 80 years). It is essential that the scale can also be applied to different age groups across the lifespan for long-term monitoring of passion. As Vallerand (2015) points out, passion has received little attention in psychology, with researchers focusing to a greater extent on related areas under the umbrella of emotions such as excitement, happiness and enjoyment. In addition, researchers have been focusing on flow (Csikszentmihalyi, 1975), mindset (Dweck, 2017), grit (Duckworth, 2016), and learning and skill development (Sigmundsson et al., 2017).

Internal Consistency of the Scale: The scale was designed with eight items that could be united into a total score to offer an overall estimate of passion across the life span. The items are designed to measure passion, defined as a strong feeling or enthusiasm towards a personal important value/preference. The sub-item coefficients shown in Table 3 ranged from 0.22 to 0.67. This demonstrates a relatively good homogeneity of test scores. The individual sub-items-to total score coefficients ranged from 0.51 to 0.69. Based on these correlations, this property of test homogeneity suggests that all items appear to be measuring aspects of the same construct, that is, passion. Test homogeneity was also evaluated by calculating Cronbach's alpha. Our finding of $\alpha = .86$ suggests that the scale has at least acceptable internal consistency (Bland & Altman, 1986).

Construct Validity of the Scale: When dealing with the construct validity of a scale, there is always a question of what should be the 'gold standard' test or scale to compare it against. In this study, we applied the Grit-S scale to assess an important aspect of criterion-related validity. Grit, measured by Grit-S, has been appraised as an important factor indicating which individuals become good in some areas. As Duckworth et al. (2011) underline, grit reflects the power of passion and persistence to reach long-term goals, despite setbacks and challenges. We found a correlation coefficient between the total score of the Passion Scale and the Grit-S scale of 0.39. This overall pattern of results suggests that the total scores of the two scales have a shared variance of 16%, which can be interpreted as moderate construct validity (Cronbach & Meehl, 1955). Further studies are now being carried out to give us a better understanding of the construct validity of the scale. The Passion Scale quantifies an individual's passion for an area/theme/skill, and in accordance with Jachimowicz et al. (2018), one could argue that both grit and passion predict performance. However, the Grit Scale mainly captures perseverance, while the Passion Scale assesses individuals' levels of passion such as involvement, commitment and effort. As presented in Fig. 3, grit and passion are intertwined constructs

that are both needed for high achievement (becoming an expert). In Fig. 3, the direction of the arrows represents the passion toward an area/theme/skill, while the dimension or size of the arrow represents the power or grade of grit.

Reliability of the scale: In repeated administration of the scale to the same participants, we obtained ICC coefficients for individual subtests ranging from 0.54 to 0.89. We are inclined to conclude that our obtained ICCs (≥ 0.54) suggest a relatively low degree of variation in test-retest of the subtests/total score. Furthermore, the ICC for the total score was 0.92. There are some limitations worth noting as the test-retest was conducted with relatively few subjects, consisting only of adult participants, and not children or older people.

5. Conclusion

Passion is possibly one explanation for why some individuals offer much time, effort and hard work towards achievement in an area/theme/skill. Research indicates that individuals who have performed outstandingly in some areas clearly have vast experience and practice in that area (Ericsson et al., 2007; Sala & Gobet, 2017). In addition, literature analysis of Charles Darwin (Darwin, 1881) and HC Andersen (Andersen, 2004) and interviews with twenty 'experts' from different fields such as sport, arts and sciences indicate that these individuals have a strong passion for the area in which they are knowledgeable about or skillful in (Sigmundsson & Haga, 2019). The presented scale was applied to a wide age-range (18–47 years). Furthermore, based on the acceptable internal consistency of the scale, the Passion 8-item scale can be useful to give an overall picture of passion. Due to the moderate correlation (0.39) coefficients found between the total scores from the Passion scale and the Grit-S scale, it can be argued that they capture some similar aspects of importance for achievement, supporting the construct validity of the scale. The findings also demonstrate that the 8 items and the total score have an acceptable reliability.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.newideapsych.2019.06.001>.

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