Perceptual Reasoning and Moral Competency as Predictors of Extraversion – A Preliminary Finding

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***Abstract*—Combination factors of perceptual reasoning and moral competency may contribute to the significant variance in explaining the extraversion trait of personality. This paper determines selected factors (i.e. perceptual reasoning and moral competency) that potentially predict the extraversion. The self-administered of Universiti Sains Malaysia Personality Inventory (USMaP-i) and the Moral Competency Inventory (MCI) were distributed to 33 undergraduate medical students studying at Health Campus, Universiti Sains Malaysia. Upon completion of the questionnaires, a quick simple intelligence test i.e. Perceptual Reasoning Test from the Wechsler Adult Intelligence Scale-Fourth edition, was performed. Moral competency explained 13% of the variance of the extraversion. Meanwhile, perceptual reasoning did not indicate any significant prediction towards extraversion. The element of morality is important to determine extraversion, rather than intelligence. However, this finding should be accepted with cautious due to the preliminary analysis and sample size limitation**

***Index Terms*—Extraversion, moral competency, perceptual reasoning, personality**

I. Introduction

Personality and intellectuality is suggested to have a significant connection [1], [2]. Specifically, intelligence measures were observed to associate with stability (rather than neuroticism), extraversion (rather than introversion) and low psychoticism. In one study that has been done among university students, those scored higher conscientiousness trait tended to score lower in intelligence tests. Also, those scored higher for openness trait tended to give higher score for intelligence [3]. This is supported by others [4] who listed personality traits such as neuroticism, extraversion, agreeableness and openness to experience that influenced self-estimation of intelligence. Another evident comes from one large sample size study (N=4859) which indicated that intelligence was predicted by the personality trait such as conscientiousness, extraversion and neuroticism [5]. However, the link between intelligence and personality traits is somewhat controversial. For example, personality traits such as conscientiousness was reported to have no correlation with intelligence [6], [7]. In addition, most theorists have not considered intelligence to be part of personality, instead asserting that intelligence is unrelated to personality [8].

Previous studies have suggested the significant connection between personality trait and morality, for example [9]. Related to this, [10] suggested that personality trait such as extroversion and neuroticism (considered as non-cognitive properties) is important in moral thinking. In [11], personality traits such achievement via independence, intellectual efficiency, tolerance, responsibility, and capacity for status (as measured by California Psychological Inventory) indicated enough coefficient to link with respondents' moral scores. In one study that was done among undergraduate university students, moral measure and its combination with personality variables, predicted 'return behavior' (return behavior was defined from informal contractual obligation in which students received course credit for completing three inventories, the third of which, due to lack of time, had to be completed at home and returned by mail. This time commitment was intentionally shortened to set up a moral situation) [12]. Another study showed that the personality of moral exemplars was oriented towards conscientiousness and agreeableness [13]. Agreeableness also characterized young adult moral exemplars [14].

From the above evidences, this study is undertaken based on the rationale that the personality construct in young adult should be determined from their moral competency as the issue of morality is very crucial in the life of young adult. Meanwhile, cognitive abilities (that is perceptual reasoning) is a mental processes that underlie many human functioning including learning, reasoning, problem solving, and decision making. Thus, it reflects human's behavior especially personality which characterizing the patterns of thoughts, feelings and behaviors.

Thus, with regards to this rationale, this study was carried out to find out how much these parameters (which are moral competency and perceptual reasoning) explain extraversion trait of personality among medical students. It is to highlight here that, it is unclear about the role of morality and intelligence in the development of human's personality. In other words, how much this set of parameter may influence the magnitude of psycho-personality among young adults? In addition, it is unclear whether the interconnection between all these parameters may indicate the nature of extraversion trait of personality. By knowing how the connection between personality (that is extraversion), moral competency and intelligence (that is perceptual reasoning), it will elucidate our understandings on the nature of the connection that shapes a person's cognition and their personality. The various types of personality are believed to inherently include a cognitive component in their construct, thus suggesting the contribution of morality and intelligence in this construct. By targeting on medical undergraduates who have considerable

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marked level of education and IQ, this confounding factor should be minimized therefore enable more accurate assessment on the influence of parameters of the interest. Again, personality which characterizing people's patterns of thoughts, feelings and behaviours, is reflected by their cognitive abilities, and thus, depicts the pattern of behaviour. Therefore, this study stands up to reach the consensus about how much these two important parameters (which are perceptual reasoning and moral competency) are responsible or explaining the dependent variable which is extravert trait of personality.

Again, we highlight important points that initiate this study to be implemented. First, (1) personality is a construct of social cognition, that growing from the intelligence capability and the element of psychosocial development (morale), and thus (2) social cognition is part of the mental processes that underlie many human functioning including learning, reasoning, problem solving, and decision making, which reflecting human's behavior especially personality, which characterizing the patterns of thoughts, feelings and behaviors.

In addition to the above justification, weakness in term of the inconsistency of the linkages between personality traits and intelligence; and personality traits and morality has been detected. This weakness leads to the missing of the combination of intelligence and morality as factor predictive of personality. Thus, this study is postulating the hypothesis as follows:

Perceptual reasoning and moral competency are factors predictive of extraversion trait of personality.

II. Methodology

A. Subject

Data was collected and analyzed from undergraduate medical students from School of Medical Sciences (PPSP), Universiti Sains Malaysia (USM). This data is part of the research that is still in progress, sponsored by Universiti Sains Malaysia short term research grant. Respondents were selected based on inclusion criteria, these were (1) Undergraduate medical students who were pursuing medical degree at PPSP, Health Campus, USM; (2) Year one until year five with aged ranged from 18 to 24 years old, (3) Regardless of gender and ethnicity (Malay, Chinese, Indian, others). However, those who have significant chronic psychiatric condition such as depression or taking any psychiatric medication, were excluded from this study.

B. Measures

1) Extraversion

The Extraversion Subscale of the Universiti Sains Malaysia Personality Inventory (USMaP-i) was used to measure extravert trait of personality [15]. The full version of the scale consists 66 items with 0 to 4 rating scales (1=Moderately Inaccurate, 2=Neither Inaccurate nor Accurate, 3=Moderately accurate). This full version of *USM Personality Inventory (USMaP-i)* covers five main areas of personality - neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. It indicates good psychometric properties and valid to be used for personality measure [16]-[17]. Twelve items were used to measure extraversion, out of 66 items. These items are 2, 7, 10, 12, 18, 25, 27, 32, 36, 55, 57 and 62.

2) Moral competency

The Moral Competency Inventory (MCI) was used to measure moral competency [18]. It is a five point Likert scale, ranging from 1 to 5 (i.e. 1 = Never; 2 = Infrequently; 3 = Sometimes; 4 = In most situations; and 5 = In all situations). Ten areas of moral competency were focused by this scale: 1) acting consistently with principles, values and, beliefs; 2) telling the truth; 3) standing up for what is right; 4) keeping promises; 5) taking responsibility for personal choices; 6) admitting mistakes and failures; 7) embracing responsibility for serving others; 8) actively caring about others; 9) ability to let go of one's own mistakes; 10) ability to let go of others' mistakes. Level of 'integrity' is indicated by the first four of the competencies. Meanwhile, competencies five through seven represent 'responsibility'. 'Compassion' is captured in competency number eight. The two end of the competencies in the MCI claim to measure 'forgiveness'. An acceptable validity has been reported elsewhere [19]. In previous study, the internal consistencies of the 10 competencies varied from 0.65 to 0.84 [19].

3) Perceptual reasoning index

The Perceptual Reasoning Index from the Wechsler Adult Intelligence Scale-Fourth edition (WAIS-IV) [20] was utilized to measure perceptual reasoning. The WAIS-IV is the fourth edition from the series of the well-known WAIS test (introduced by David Wechsler in 1955) to measure the intelligence through administration of numerous related cognitive task [21]. The subtest of Perceptual Reasoning Index (PRI) consists of the series of tests such as Block Design (BD), Matrix Reasoning (MR) and Visual Puzzles (VP) with the supplementary test such as Figure Weights (FW) and Picture Completion (PCm). The BD measures non-verbal reasoning; visual perception and organization; and visual-motor coordination. Meanwhile, the MR measures fluid intelligence, visuospatial ability, simultaneous processing, and perceptual organization. Perceptual reasoning, visuospatial ability, analysis and synthesis, and simultaneous processing are the specific areas covered by the VP. For the FW, it measures fluid reasoning, which is different from the PCm which focus on visual perception, perceptual organization, and attention to visual detail. Combination of these three core subtest (i.e. BD + MR + VP) will provide the level of PRI for tested subjects.

Each subtest has different types of intelligence measure, which could be accumulated to perform the level of perceptual reasoning index (PRI) of intelligence. The timing for timed-subtests is very important and need to be precised as extra time will results in zero marks. The scores for both BD and VP depend on the time allocated for each questions while MR depends on the correct answer. The raw score accumulated from these three core subtests made up a total composite score of PRI.

C. Procedure

Prior to the participation in the study, respondents were

explained thoroughly of the objective of the study and were asked to give their signature for the consent form upon the agreement to participate in the study. Participants could forfeit at any time on their own choice as the participation is voluntary. Recruitment of the respondents was implemented by using purposive sampling, based on the inclusion and exclusion criteria of the study (see the section of subject). Cognitive test for perceptual reasoning was held at the Clinical Neuroscience Laboratory, Universiti Sains Malaysia. At the same, the standardized questionnaires were distributed prior to the test. The instruction and items of the questionnaires could be understood easily and respondents took about 10-15 minutes to complete each questionnaire. Meanwhile, for the perceptual reasoning test, the test was facilitated by the researcher and clinical psychologist. Respondents were first explained on how the task will be carried out before running the test. Some subtests were timed, thus, respondents needed to perform the task within the time limit with guidance from the researcher. In this study, only three main tests were implemented. These were the Block Design, Matrix Reasoning and Visual Puzzles, to perform the level of perceptual reasoning intelligence of the tested respondents. Ethical approval has been obtained from the Human Research Ethics Committee of Universiti Sains Malaysia.

III. Results

Majority of the respondents who participated in this study was Malay (76%, *N*=25), followed by Chinese (12%, *N*=4), Indian (9%, *N*=3) and others (3%, *N*=1). More than half of the respondents were female (*N*=23, 70%) than male (*N*=10, 30%) (Table I). Mean age of the respondents were 21 (±1.5) years old.

TABLE I: Socio-Demographic of the Respondents

		Number of Respondent (*N*=33)	Percentage
Gender	Male	10	70%
	Female	23	30%
Ethnicity	Malay	25	76%
	Chinese	4	12%
	Indian	3	9%
	Others	1	3%

Mean of extravert trait among these students is 30.5 (±7.2). Meanwhile the mean of moral competency is 158.1 (±14.5) with perceptual reasoning 105.3 (±10.9) (Table II).

TABLE II: Mean and Standard Deviation of the Extravert Trait, Moral Competency and Perceptual Reasoning

Variable	Sample Size	Mean	Standard Deviation
Extravert Trait	33	30.5	±7.2
Moral Competency	31	158.1	±14.5
Perceptual Reasoning	33	105.3	±10.9

Note: Two respondents did not answer the moral competency inventory in complete, therefore they were not included in the analysis.

The proposed hypothesis which stated that perceptual reasoning and moral competencies are the factors predictive of extraversion trait of personality among the medical students is not fully supported. The stepwise regression analysis indicated that only the moral competencies predicted extraversion (that is, 13% of the variance of the extraversion trait among these medical students was explained by the moral competency) (Unstandardized Coefficients, *B*=0.17; *p*=0.048). Meanwhile, the perceptual reasoning was not revealed as factor predictive of the extraversion (Table III).

TABLE III: Stepwise Multiple Regression Analysis of the Extravert Trait of Personality: Moral Competency and Perceptual Reasoning as Predictors

Predictors:	*B* SE *p* Value
Moral Competency	0.17 0.08 0.048*
Perceptual Reasoning [Excluded]	
R Square : 0.13	
F Statistic : *F* (1, 29) = 4.23	

B: Unstandardized coefficient.
SE: Standard error.
*$p<0.05$

IV. Discussion

The element of morality in personality-developmental approach presents a wider theoretical framework of this research. This study reflects the important theoretical argument in determination of the element of morality in one's personality trait. Although the strength of the connection is not very high, this findings have some important implications for the theory and practice related to psycho-personality education, which emphasizing the moral thinking and judgement. When looking back at some important research in psycho-personality from 80's to early 2000, there is not sufficient documentation with regards to the association between personality traits and moral reasoning [11], [22]. However, [22] detected some degree of coefficient between personality factor (i.e achievement via independent) and moral reasoning. Even though moral-cognitivistic approach may not provide a comprehensive elucidation of the moral judgement processes; and in general does not indicate strong relation between personality and moral reasoning, [10] argued that the non-cognitive component of psycho-personality (such as empathy, extroversion and neuroticism) are imperative in the development of conventional forms of moral thinking which related to interpersonal accord and conformity in social norms and authority and social-order maintaining orientation in law and order morality. Thus, some characteristics in psycho-personality were detected to tie with the level of morality - those who preferred principled moral reasoning in making moral decisions were seen as dependable, creative, intelligent, and flexible in thought and action [22]. The present finding shadows [22] who pointed several important facts related to personality and morality as follows: (a) Young adults indicated important attribute to principled level of moral judgement that was related significantly to the measures of social poise and extroversion. (b) the 'person-oriented' (such as value group activities, meetings, moral-building opportunities and discussions to solve

problems and make plans) points to the high preference for principled levels of moral judgment. (3) The criteria for morality appear to be dependent on intellectual resources and resourcefulness. It is suggested that the component of morality is critical in developing materials for psycho-personality education.

As a direction for the future research, it is important to look into the morality and personality from the framework of cultural neuroscience (CN). This framework will help us to understand the influence of culture's elements such as values, practices, and beliefs in the developing of one's morale and personality. Uniquely, the construction of a CN framework relies on theories from various disciplines such as anthropology, psychology, and genetics. In a recent study, CN was framed in multiple time scales (situation, ontogeny, and phylogeny) in order to explain how the diversity of the cultural values and genetic factors contour the complexity of the human mind and behavior [23]. Similar to the previous contribution in CN, It is stated that cultural capacities and their transmission that arose from complex human mental and neurobiological processes were critically determined from bidirectional indicators (culture and gene) across two timescales: macro and micro timescales [24]. With this regard, the macro timescale determines phylogeny and lifespan, whereas the micro timescale determines the situation. In this regard [25], "culture" is viewed as a set of traits that is inflexible and has specificities. In other words, the variation of population culture can be manifested in neural activation patterns, which highlight the fundamental value in the development of racial identity and ideology [26], especially in the multiethnicity population like Malaysia.

A cultural approach, through interdisciplinary educational infrastructure and research may provide a better understanding of health disparity and merging the health quality across diverse cultural populations [24], [27-28], as well as reflects crucial implication in health disparities and public policy development [23]. Within this culture framework, the trait of "individualism-collectivism" in cultural dimensions that modulate the psychological neural basis can be highlighted [23] to explain the interaction between personality and morality in one's psycho-physiology development. However, bringing culture into the moral and personality research mainstream is not an easy task. The main challenge is to empower the educational medium that has capability to provide a comprehensive and culturally sensitive framework to educate the future generation. This objective could be achieved by improving the research infrastructure, increasing research capacity, and establishing appropriate ethical standards.

Perceptual reasoning index which reflects one's ability to think abstractly [29] and implies many meanings such as learning, planning, comprehending, imagination, making decisions, perception, and so on, did not predict extraversion. It has to be understood that intelligence is not restricted to only academic's score and the ability to answer problems, but more of how a person is able to make use of their surroundings to their benefits with their intellect which differs for every person. Although there are several competing hierarchical theories regarding intelligence especially perceptual reasoning specifically, most theories specify general intelligence (g) as the highest node and it is broken down into other specific abilities [30-31]. With this regard, previous studies concerned on the validity of using general intelligence rather than narrow cognitive abilities in predicting important life outcomes [32-33]. Thus, it is suggested that the interpretation of the role of intelligence in explaining personality should be considered cautiously due to its complexity. If we follow the hierarchical level of intelligence level (g) by [34], the below level was defined as 'between fluid and crystallized intelligence'. Crystallized intelligence is considered as verbal and fluid intelligence is considered as non-verbal. As mentioned by [34], fluid ability is less dependent on the experience and knowledge while crystallized knowledge is based on education and experience. In addition, using these two categories, the categories could be expanded into more minor five, six or seven order groups. For example, [35] proposed that intelligence have seven factors: Linguistic, Logical-mathematical, Spatial, musical, Bodily kinesthetic, Interpersonal, and Intrapersonal; which is different from Ackerman's theory despite having the same amount of seven second order factors: Fluid intelligence, Visual perception, Perceptual speed, Learning and memory, Knowledge and achievement, Ideational fluency, and Crystallized intelligence [36]. Hence, it is highlighted here that, researchers usually refer to the intelligence theory based on the type of instruments used to measure intelligence. Numerous studies that aim to assess the level of intelligence should consider several confounders. Each person has their own dominance in what classes or types of intelligence, influenced by many factors such as genetics, age, schooling background, environment and even personality [37].

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REFERENCES

[1] S. Chen, B. Mulgrew, and P. M. Grant, "A clustering technique for digital communications channel equalization using radial basis function networks," *IEEE Trans. on Neural Networks*, vol. 4, pp. 570-578, July 1993.

[2] A. Anastasi and S. Urbina, *Psychological Testing*, 7th ed., Upper Saddle River, NJ: Prentice-Hall, 1997

[3] J. P. Rushton, *Race, Evolution and Behavior: A Life History Perspective*, New Brunswick, NJ: Transaction, 1995

[4] T. C. Premuzic, A. Furnham, and J. Moutafi, "The relationship between estimated and psychometric personality and intelligence scores," *Journal of Research in Personality*, vol. 38, pp. 505-513, 2004.

[5] A. Furnham, A. Kidwai, and C. Thomas, "Personality, psychometric intelligence and self-estimated intelligence," *Journal of Social Behavior and Personality*, vol. 16, pp. 97-114, 2001

[6] J. Moutafi, A. Furnham, and I. Tsaousis, "Is the relationship between intelligence and trait Neuroticism mediated by test anxiety?" *Personality and Individual Differences*, vol. 40, no. 3, pp. 587-597, 2006.

[7] P. L. Ackerman and E. D. Heggestad, "Intelligence, personality and interests: evidence for overlapping traits," *Psychological Bulletin*, vol. 121, pp. 219-245, 1997.

[8] P. Kyllonen, *Smart Testing Handbook on Testing*, Westport, CT, US: Greenwood Press/Greenwood Publishing Group, Inc, 1997, pp. 347-368

[9] H. J. Eysenck, "Personality and intelligence: Psychometric and experimental approaches," in *Personality and Intelligence*, R. J. Sternberg and P. Ruzgis Eds., New York: Cambridge University Press, 1994, pp. 3-31.

[10] B. Connor, "Moral development, moral orientation and personality types," *The International Journal of Learning*, vol. 16, no. 1, pp. 335-346, 2009.
[11] S. Stojiljkovic, "Personality characteristics and moral judgement," *Philosophy and Sociology*, vol. 1, no. 5, pp. 507-514, 1998.
[12] E. Mudrack, "Moral reasoning and personality traits," *Ptpchological Reports*, vol. 98, pp. 689-698, 2006.
[13] S. R. Drass, "Moral reasoning and personality variables in relation to moral behavior," M. S. thesis, Fort Hays State University, Kansas, United States, 1982.
[14] L. J. Walker, "The perceived personality of moral exemplars," *Journal of Moral Education*, vol. 28, pp. 145-162, 1999.
[15] K. Matsuba and L. J. Walker, "Young adult moral exemplars: The making of self through stories," *Journal of Research on Adolescence*, vol. 15, pp. 275-297, 2005
[16] M. Yusoff, A. Rahim, and A. R. Esa. (2010). The USM Personality Inventory (USMaP-i) Manual. [Online]. Available: http://www. medic. usm.my/dme/images/stories/staff/KKMED/2010/manual% 20usmap-i. pdf
[17] M. S. B. Yusoff, "The validity and reliability of the USM Personality Inventory (USMaP-i): Its use to identify personality of future medical students," *International Medical Journal*, vol. 18, no. 4, pp. 283-287, 2011.
[18] M. S. B. Yusoff, "Stability of the USMaP-i in measuring the Big Five personality traits," *International Medical Journal*, vol. 20, no. 1, pp. 1-3, 2013.
[19] D. Lennick and F. K. Keil, *Moral Intelligence*, Pearson Education, Inc. Prentice Hall, Upper Saddle River, 2005, pp. 1-7.
[20] D. E. Martin, "Moral competency inventory validation: content, construct, convergent and discriminant approaches," *Management Research Review*, vol. 33, pp. 437-451, 2010.
[21] D. Wechsler, *Wechsler Adult Intelligence Scale—Fourth Edition (WAIS-IV)*, 2008.
[22] G. L. Canivez and M. W. Watkins, "Investigation of the factor structure of the wechsler adult intelligence scale—fourth edition (WAIS-IV): exploratory and higher order factor analyses," *Psychological Assessment*, vol. 22, no. 4, pp. 827, 2010.
[23] P. Polovy, "A study of moral development and personality relationships in adolescents and young adult in catholic students," *Journal of Clinical Psychology*, vol. 36, pp. 752-757, 1980.
[24] J. Y. Chiao, B. K. Cheon, N. Pornpattananangkul, A. J. Mrazek, and K. D. Blizinsky, "Cultural neuroscience: progress and promise," *Psychological Inquiry: An International Journal for the Advancement of Psychological Theory*, vol. 24, no. 1, pp. 1-19, 2013.
[25] J. Y. Chiao, T. Harada, H. Komeda, Z. Li, Y. Mano, D. N. Saito, T. B. Parrish, N. Sadato, and T. Iidaka, "Neural basis of individualistic and collectivistic views of self," *Human Brain Mapping*, vol. 30, pp. 2813-2820, 2009.
[26] M. M. Mateo, M. Cabanis, N. C. E. Loebell, and S. Krach, "Concerns about cultural neurosciences: a critical analysis," *Biobehavioral Reviews*, vol. 36, pp. 152-161, 2012.
[27] S. Choudhury and L. J. Kirmayer, "Cultural neuroscience and psychopathology: prospects for cultural psychiatry," *Progress in Brain Research*, vol. 178, pp. 263-283, 2009.
[28] J. F. Dovidio and S. T. Fiske, "Under the radar: How unexamined biases in decision-making processes in interactions can contribute to health care disparities," *American Journal of Public Health*, vol. 102, pp. 945-952, 2012.
[29] D. R. Williams, D. A. John, D. Oyserman, J. Sonnega, S. A. Mohammed, and J. S. Jackson, "Research on discrimination and health: An exploration study of unresolved conceptual and measurement issues," *American Journal of Public Health*, vol. 102, pp. 975-978, 2012.
[30] L. S. Gottfredson, "Mainstream science on intelligence: An editorial with 52 signatories, history, and bibliography," *Intelligence*, vol. 24, no. 1, pp. 13-23, 1997.
[31] W. Johnson and T. J. Bouchard, "The structure of human intelligence: It is verbal, perceptual, and image rotation (VPR), not fluid and crystallized," *Intelligence*, vol. 33, no. 4, pp. 393-416, 2005.
[32] W. Johnson and T. J. Bouchard, "Constructive replication of the visual-perceptual-image rotation model in Thurstone's (1941) battery of 60 tests of mental ability," *Intelligence*, vol. 33, no. 4, pp. 417-430, 2005.
[33] I. J. Deary, "Introduction to the special issue on cognitive epidemiology," *Intelligence*, vol. 37, no. 6, pp. 517-519, 2009.
[34] L. Gottfredson and D. H. Saklofske, "Intelligence: Foundations and issues in assessment," *Canadian Psychology*, vol. 50, no. 3, pp. 183, 2009.
[35] C. G. DeYoung, *Intelligence and Personality*, The Cambridge handbook of intelligence, 2011, pp. 711-737
[36] J. Maltby, L. Day, and A. Macaskill, *Personality, Individual Differences and Intelligence*, Prentice Hall, 2007
[37] P. L. Ackerman and E. D. Heggestad, "Intelligence, personality, and interests: evidence for overlapping traits," *Psychological Bulletin*, vol. 121, no. 2, pp. 219, 1997
[38] W. Weiten, *Concept Charts for Study and Review: for Psychology, Themes and Variations*, 6th ed, Thomson Wadsworth, 2004.

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