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MORALITY BEFORE KNOWLEDGE

Moderation effect analysis of assimilator-explorer cognitive style in the relationship between big five personality and innovative work behavior

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ABSTRACT

Background: This research is aim to see the moderate effect of assimilator-explrorer cognitive styles on the relationship between big five personality and innovative work behavior. **Methods:** This quantitative study utilized a non-probability convenience sampling method involving 125 employees from a shipbuilding manufacturing company. Data were analyzed using descriptive statistics, Pearson correlation, One-Way ANOVA, and a simple regression test with the PROCESS macro by Hayes to examine the moderating effect. **Findings:** Effect of moderation is considered due to inconsistent relationship between the big five personality and innovative work behavior. **Conclusion:** The main results of this study were processed using regression test with a PROCESS macro from Hayes (2013) and accompanied by additional results that is correlation between variables and demography analysis. Four dimension of big five personality are significantly correlated with innovative work behavior, 1 dimension of big five personality is significantly correlated with assimilator-explorer cognitive style, and there is no correlation between assimilator-explorer cognitive style and innovative work behavior. Based on demography analysis, there is difference score on assimilator-explorer cognitive style by job tenure, work unit and education. Based on the regression test, there is moderation effect of assimilator-explorer cognitive style on neuroticism dimension personality and innovative work behavior $F(3,121)=4.76$, $R^2=0.03$, $b=-0.16$, $t(121)=-2.18$ ($p<0.05$). **Novelty/Originality of this article:** This study is different from previous studies. Therefore, further research is strongly encouraged to understand the role of cognitive-asimilator-explorer style in moderating the five major personalities and innovative work behaviors.

KEYWORDS: assimilator-explorer cognitive style; big five personality; innovative work behavior; moderation effect.

1. Introduction

Innovation is a process consisting of several stages in which organizations change their ideas to update or improve products, services, or processes with the aim of increasing, competing and differentiating the organization in order to be successful in the market (Baregheh et al., 2009). Awareness of innovation in companies arises from the existence of tight competition between companies engaged in the same field. As mentioned on the Forbes (n.d) website that one of the positive impacts of business competition is the drive to innovate. In other words, efforts to innovate are one of the efforts made by companies to dominate the market and win business competition. In innovating, companies have

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resources that are divided into two groups, namely sources of innovation at the individual level and sources of innovation at the organizational level (Patterson et al., 2009). What is meant by sources of innovation are elements within the company that influence how innovation in the company will run. At the individual level, innovation in companies comes from the cognition, personality, emotions and behavior of company employees. These individual characteristics will directly or indirectly affect the success of innovation. Companies that want to create a culture of innovation need to develop innovative human resources and provide facilities that support the innovation of their employees (Patterson et al., 2009). Meanwhile, at the organizational level, companies that are trying to innovate must consider the effects of the work environment, organizational climate and the work design of the company itself.

Based on the two factors above, individual and organizational, this study focuses on innovation at the individual level. Innovation at the individual level is a construct that has been widely discussed by researchers using different terms or designations. One term that is widely used to discuss individual-level innovation is innovative work behavior (Innovative Work Behavior) proposed by Scott & Bruce (1994). This construct discusses innovative work behavior at the individual level in an organizational context. Janssen (2000) defines innovative work behavior as a deliberate action in creating, introducing, and implementing new ideas in a group/organization and can provide benefits. Research on innovative work behavior has been widely conducted both abroad and in Indonesia. From several studies, researchers found that there is a correlation between innovative work behavior and big five personality that is inconsistent and has a low effect size. Madrid et al. (2012) found that only 5% of innovative work behavior can be predicted by openness to experience personality. Michael et al. (2011) found that the extraversion dimension is only able to predict 6% of innovative work behavior, the agreeableness, conscientiousness, openness dimensions are able to predict more than 10% of innovative work behavior and the neuroticism dimension is not correlated with innovative work behavior. Research conducted by Putri & Etikariena (2013) found that only 2% of the tendency of innovative work behavior can be predicted by the agreeableness and conscientiousness personality dimensions. In addition, Chen et al. (2010) found that 9% to 10% of the stages of innovative work behavior can be predicted by the extraversion, agreeableness and openness dimensions. Based on Cohen's effect size (…), r= 0.02 (weak correlation), r= 0.09 (moderate correlation) and r= 0.25 (strong correlation). In other words, the effect size between the big five personality and innovative work behavior in the above studies is still inconsistent. Therefore, the researcher wants to test the relationship between the big five personality and innovative work behavior.

After conducting a literature review, it turns out that the relationship between personality and behavior is not a direct relationship. This means that a personality trait that a person has does not necessarily make that person behave exactly the same as their personality. Personality will interact with other individual factors and situational factors faced by the individual before forming specific behavior (Ajzen, 2005). Based on this, the relationship between personality and innovative work behavior is indeed inconsistent because many other factors influence the two constructs. This makes researchers consider the influence of these other factors in strengthening or weakening the correlation between innovative work behavior and the big five personality dimensions. The variables used to strengthen or determine the direction of the correlation of other variables are known as moderator variables (Widhiarso, 2009). Moderator variables are other variables that can change the direction and strength of the correlation of the two main variables being studied. While the mediator variable is a variable that is a link between the two main variables being studied. This means that the correlation between the two variables will not occur without the mediator variable. Researchers did not choose a mediating variable because big five personality and innovative work behavior have been proven to be correlated, only the relationship between the two variables is still weak and inconsistent. While the mediating variable is used to be a bridge between two previously unrelated variables.

Of the many other individual factors and situational factors, researchers see that the cognitive construct may be a factor that influences the effects of personality on behavior. Cognition is the process of processing information that occurs within an individual and is one of the causes of behavior (Wilson & Clark, 2009). Before a behavior is displayed by an individual, the behavior has been processed first by the individual in their cognition. The discussion of cognition is quite broad, starting from the concept of intelligence, learning style, cognitive style, metacognition to other mental processes. Based on literature studies, researchers found that the concept of cognitive style is related to the construct of personality and behavior. By definition, cognitive style is an individual character that is consistent in organizing and processing information and experiences (Messick, 1984). Cognitive style is a tendency that underlies the individual's process of processing information, is displayed spontaneously, and is displayed in various situations faced by the individual. This habit of thinking is not about how individuals respond to specific situations, but rather the individual's tendency to process information in all situations. Cognitive style is considered as a construct that bridges aspects of personality with attitudes, methods and directions of cognition (Martinsen & Diseth, 2011). In other words, cognitive style connects personality with cognition. Furthermore, the results of the information processing process will appear in behavior.

Although it is a bridge between personality and cognition, cognitive style is not treated as a mediator variable. The mediating role of cognitive style in the description above is only an attempt to explain the position of cognitive style between personality and cognition. In other words, it is known that cognitive style has a direct relationship with personality and an indirect relationship with behavior. According to researchers, if cognitive style is related to the two main variables in this study, then cognitive style has more potential to provide a moderating effect. There are several different terms in mentioning and grouping cognitive styles. In this study, the term used is the assimilator-explorer cognitive style by Kaufmann (1979). Assimilator is a rational and schematic cognitive style, while explorer is a spontaneous and flexible cognitive style. Unlike other figures who distinguish inventories of two forms of cognitive style, Kaufmann actually combines assimilator-explorer into one measuring instrument. In the assimilator-explorer cognitive style inventory (A-E Style), cognitive style is measured in the form of a continuum. The higher the score obtained, the greater the individual's tendency to have an explorer cognitive style. While the lower the score obtained, the greater the individual's tendency to have an assimilator cognitive style.

In early research, Scott & Bruce (1994) also linked innovative work behavior with cognitive style. In the study, it was stated that innovative work behavior correlated with intuitive problem-solving style and negatively correlated with systematic problem-solving style. Scott & Bruce (1994) measured problem-solving style using the associative/diassociative index compiled by Jabri. Associative refers to a problem-solving style that is based on rules and systematic, while disassociative refers to a problem-solving style that does not follow rules (Jabri, 1991). Although Scott & Bruce used Jabri's measuring instrument, this study measured cognitive style using Kaufmann's inventory. The researcher decided to use the assimilator-explorer cognitive style over other cognitive styles because this measuring instrument has the potential to be explored. Based on the literature study, the researcher has not found any research on the assimilator-explorer cognitive style in Indonesia. Therefore, this study is also an initial study of the assimilator-explorer cognitive style. Because there has not been much development in Indonesia, there are still many opportunities to explore the role of the assimilator-explorer cognitive style. In theory, associative/disassociative is similar to assimilator-explorer proposed by Kaufmann. Associative problem-solving style is the same as assimilator cognitive style. Individuals who are associative/assimilators will tend to respond to situations according to existing rules or schemes. Conversely, individuals who use disassociative/explorer style will tend to respond to situations spontaneously. Although they have the same meaning, the way to measure associative/disassociative is different from assimilator/explorer. Jabri sees associative/disassociative as two ways of thinking that each stand alone (Jabri, 1991). While assimilator-explorer is seen as a continuous cognitive style (Martinsen & Diseth, 2011).

Assimilator-explorer cognitive style is related to experience, problem solving, and creativity (Martinsen, 1995). According to Martinsen's research (1995), assimilator-explorer cognitive style is correlated with creativity. Individuals with an explorer cognitive style are proven to be more creative than assimilator individuals based on Martinsen's (1993) research using a creative activities checklist. In theory, creativity and innovation are two different constructs. Based on the stages of innovative work behavior, creativity is similar only to the idea generalization stage. In other words, creativity is a small part of innovative work behavior. The assimilator-explorer cognitive style is also related to the big five personality types. The highest correlation is found in openness and extraversion personalities (Martinsen & Diseth, 2011). According to the study, individuals with an explorer cognitive style are more open to new experiences, have more stable emotions, and are low on agreeableness and conscientiousness scores. Meanwhile, the assimilator cognitive style has characteristics that are the opposite of the explorer cognitive style. Based on the explanation above, it can be concluded that researchers will involve the assimilator-explorer cognitive style between the big five personality and innovative work behavior. The assimilator-explorer cognitive style will be a moderating variable. This means that the existence of assimilator-explorer cognitive style can strengthen or weaken the relationship between big five personality and innovative work behavior. By considering the relationship between assimilator-explorer cognitive style and creativity and personality, the researcher determines this construct as a moderator variable.

2. Methods

2.1 Participant

This study uses a nonprobability sampling method with an unknown population, an unknown probability of each individual being sampled, and a sampling method based on convenience (Gravetter & Forzano, 2012). The population of this study is all employees working in organizations that are innovating. This study aims to measure innovative work behavior only in organizations that have innovative targets and are innovating. This is because researchers assume that in conditions of innovation, innovative work behavior will be easier to measure than conditions that are not innovating. The sample of this study were employees in several divisions at PT. X which is engaged in shipbuilding manufacturing.

The selection of PT. X as the location for data collection because the company is innovating. Before collecting data, researchers have obtained permits according to established procedures. Researchers also held discussions with PT. X about which divisions would be the samples for this study. By considering the busyness of each division and the relationship of division work tasks to the topic of this study, 4 divisions were selected from 18 existing divisions. These divisions are production division 1, production 2, design and general engineering. Education level is limited to workers with a minimum of high school/vocational high school/equivalent education. The working period of research participants is limited to employees who have worked at PT X for the same or more than 2 years. Participants in this study must be permanent employees. Participants are employees of PT X with a minimum position of office staff. The number of participants used in this study was 125 employees.

2.2 Research instruments and data processing

For the innovative work behavior variable, the measuring instrument used is the Innovative Work Behavior Scale (IWB) or hereinafter referred to as the Innovative Work Behavior Scale. This scale was originally compiled by Scott and Bruce (1994) and developed by Janssen (2000). This measuring instrument consists of 9 statement items, every 3 statements represent 1 stage of innovative work behavior. This measuring instrument uses a Likert scale with a choice range of 1 to 6. Janssen (2000) explains that the innovative work behavior scale is a unidimensional scale, meaning that the score obtained from this

measuring instrument only describes innovative work behavior as a whole and cannot be broken down into scores for each stage. The lowest score is 9 and the highest score is 54. This measuring instrument was previously used by Putri an&d Etikariena (2013) with a reliability of 0.80 and a validity range of 0.36 to 0.62. In this study, the reliability obtained was 0.96 and a validity range of 0.77 to 0.88. The minimum score that can be achieved by this measuring instrument is 9, the maximum score is 54 and the middle value is 31.5. After processing the data, it is known that the average score of innovative work behavior is 34.16 with a minimum score of 9 and a maximum score of 54 and a standard deviation of 12.07. According to the middle value of the scale, the participants in this study can be divided into two groups based on scores above the median scale and scores below the median scale. There are 77 participants who are included in the high score group of innovative work behavior and 48 participants who are included in the low score group of innovative work behavior. By looking at the distribution of participant scores, it can be said that the majority of participants in this study have a high tendency to innovate.

For the big five personality variables, the measuring instrument used is the Mini-IPIP. Based on research conducted by Donnellan, et al. (2006), the Mini-IPIP has quite high content validity with the IPIP-NEO. Of the 30 facets, only 2 facets differed by more than 0.12 between the Mini-IPIP and IPIP-NEO (Donnellan et al., 2006). This measuring instrument is a multidimensional measuring instrument, meaning that the score of this measuring instrument can see the high and low levels of individual personality factors in each dimension. The Mini-IPIP consists of 20 items where each dimension is represented by 4 items. Each dimension has at least 2 reversed items. This measuring instrument uses a Likert scale with a range of 1 to 6. This measuring instrument was previously used in the study of Putri & Etikariena (2013) with a reliability of 0.56 and a validity range of 0.2 to 0.3. However, in that study, Putri & Etikariena deleted 10 items because they had low validity during the trial. While in this study, the researchers chose to improve the items with low validity after the trial. In the primary data, the overall reliability is 0.53, extraversion 0.45, agreeableness 0.21, conscientiousness 0.44, neuroticism 0.41 and openness 0.39. If this measuring instrument is separated based on dimensions, the reliability coefficient obtained can be seen in the table above. There is no personality dimension that meets the reliability coefficient standard of 0.6. With the reliability coefficient as above, the Mini-IPIP measuring instrument does not have sufficient internal consistency. The reliability coefficient above is different from the reliability obtained when conducting a trial. Previously, the overall reliability was 0.71 in the trial data. This alpha coefficient decreased when processed on the primary data. The maximum score of the Mini-IPIP measuring instrument on each dimension in the primary data is 24, the minimum score is 3 and the median is 14.

The assimilator-explorer cognitive style variable is measured using the assimilator-explorer inventory. The Assimilator-Explorer Inventory compiled by Kaufmann (1989) consists of 30 items with 5 answer choices. However, in this study, the researcher decided to add one answer choice to avoid neutral answers. This measuring instrument measures cognitive style continuously by using the explorer cognitive style for scoring. 16 statement items will be reversed to describe the explorer cognitive style. Interpretation of this measuring instrument can be done by looking at the position of the individual's score from the total score of the measuring instrument. Individuals with high scores will enter the explorer cognitive style category, while individuals with low scores will enter the assimilator category. As far as the researcher's search has been carried out, no research has been found that uses the assimilator-explorer inventory. So this inventory must first be adapted into Indonesian. Based on the results of data processing, it is known that the assimilator-explorer cognitive style variable has a mean of 90.46 with a minimum score of 72 and a maximum score of 78, a standard deviation of 7.382. This measuring instrument has a reliability coefficient of 0.55. This inventory has a maximum scale of 180, a minimum scale of 30, and a median of 105. Based on the mean value of the assimilator-explorer inventory, the majority of research participants are included in the low explorer cognitive style group or tend to be assimilator cognitive style. A total of 121 participants are included

in the assimilator cognitive style and only 4 participants are included in the explorer cognitive style.

This study uses 3 data processing methods, namely descriptive, correlation and regression tests. Descriptive data processing is used to see the description of participants and One Way ANOVA to compare demographic data scores and research variables. Correlation tests are carried out using Pearson Correlation to see the relationship between research variables. Furthermore, a simple regression test is carried out using PROCESS Macro to see the moderation effect.

3. Result and Discussion

3.1 Innovative work behavior

Janssen (2000) innovative work behavior is a deliberate action in creating, introducing, and implementing new ideas in a group/organization and can provide benefits. Innovative work behavior has several stages, namely the idea generalization stage, the idea promotion stage and the idea realization stage. These stages are in accordance with Kanter's theory (1988) regarding innovation at the individual level. At the idea generalization stage, individuals recognize problems and then create ideas or solutions to those problems.

The idea promotion stage is the stage where individuals introduce their ideas to others and invite others to work together to realize the idea. After getting support from other parties, individuals realize the idea into real action. Although referred to as 'Stages', basically individuals can be in more than two stages simultaneously and not always sequentially. Scott & Bruce (1994) added that individuals can be in these stages at one time at once. This is because innovation is an ongoing activity, not an activity where each stage is very different from each other, innovation is also not an activity that can only be done sequentially.

3.2 Big five personality

Personality can be considered as “a relatively enduring pattern of thoughts, feelings, and behaviors that distinguishes one individual from another, but can still change into old age” (Roberts & Mroczek, 2008). In this study, personality is viewed through a dispositional/traits approach. Traits are “differences in individual behavior, behavioral consistency, and behavioral stability across situations, can be found in many people but still have different patterns in each individual” (Feist et al., 2014). This personality trait approach has been developed until reaching an agreement that human personality can be defined by 5 trait dimensions or what is known as the five factor model.

Researchers who support the personality trait theory use different terms to refer to the 5 dimensions. Digman (1990) explains the differences in terms used to refer to the 5 dimensions of personality, for example, dimension 1 of personality is called assertiveness by Borgatta and called extraversion. Based on the literature study, the researcher finally used the terms established, namely, dimension 1 as extraversion, dimension 2 as agreeableness, dimension 3 as conscientiousness, dimension 4 as neuroticism, and dimension 5 as openness. The terms of these dimensions have been used in many studies and their measuring instruments have also been widely developed.

3.3 Assimilator-explorer cognitive style

Martinsen et al. (1999) also provide almost the same definition, namely the different and consistent ways individuals experience, perceive, organize, and process information. Cognitive style is usually referred to as a person's general habits in processing information. This tendency to think in line with the affective, temperamental, and motivational structures of the individual's personality (Messick, 1994). Previous researchers have used

different terms to group cognitive styles. In this study, the term used is the assimilator-explorer cognitive style used by Kaufmann (1979).

The assimilator cognitive style is a habit of rational thinking, acting according to schemes, making decisions according to rules, less effort in deciding something, systematic, efficient thinking style, difficulty if the problems faced do not match the schemes owned, through simple procedures. While the explorer cognitive style is a spontaneous thinking habit, open to various alternatives, flexible, does not like to be tied to rules, is not systematic, inefficient because it tends to look for new problem solving even though there is a scheme that can facilitate the solution, through complex procedures. It should be emphasized that the term 'habit' here does not have the same meaning as the term habit commonly used in the behaviorist approach. Cognitive style develops from childhood to adulthood and is relatively stable. Therefore, if an individual has an explorer cognitive style, then it will be very difficult for him to change to use the assimilator cognitive style. Likewise, the opposite is true for individuals who have assimilator thinking habits.

3.4 Research result

Based on the correlation test using Pearson Correlation, the results obtained are that all personality dimensions are correlated with innovative work behavior except the openness dimension. More specifically, the extraversion and conscientiousness dimensions are significant at $p<0.05$ and the agreeableness and neuroticism dimensions are significant at $p<0.01$. According to Cohen (in Gravetter & Wallnau, 2013), the coefficient $r>0.1$ is small and $r>0.2$ is moderate. The correlation between the extraversion and conscientiousness dimensions has a small effect size. On the other hand, the correlation coefficient of agreeableness and neuroticism has a moderate effect size. In addition, all correlations have a positive direction except for the neuroticism dimension. For the correlation between the big five personality and the assimilator-explorer cognitive style, the only dimension that has a significant correlation is the conscientiousness dimension. The coefficient r of the conscientiousness dimension and cognitive style is at a moderate effect size with a negative correlation direction. This means that an increase in the conscientiousness dimension score will be accompanied by a decrease in the individual's cognitive style score. Meanwhile, based on the results of data analysis, it is known that the correlation between innovative work behavior and assimilator-explorer cognitive style has a significance of $p>0.05$. This means that statistically these two variables are not related to each other.

Table 1. Moderation analysis

Dimensions	Moderation Analysis (F)	Moderation Analysis (B)	Moderation Analysis (r^2)	Moderation Analysis (P)	Moderation Analysis (LLCI)	Moderation Analysis (ULCI)
Extraversion	1.48	0.11	0.01	0.22	-0.07	0.29
Agreeableness	0.03	0.02	0.00	0.86	-0.17	0.21
Conscientiousness	0.03	0.01	0.00	0.87	-0.15	0.17
Neuroticism*	4.76*	0.16	0.02	0.03	-0.31	-0.01
Openness	-0.00	-0.00	0.00	0.94	-0.18	0.17

Based on the table above, it is known that the moderation effect only occurs in the neuroticism dimension. Based on the regression test, overall the value of $F(3,121) = 5.18$, $p <0.05$, $R^2 = 0.10$ was obtained. This means that the total effect of the assimilator-explorer cognitive style and the neuroticism dimension is able to predict innovative work behavior. For the neuroticism dimension variable, the results obtained were $b = -0.25$, $t(121) = -3.17$, $p = 0.00$. Every 1 increase in score on the neuroticism dimension will reduce 0.25 points of innovative work behavior. Meanwhile, for the assimilator-explorer cognitive style variable, the results obtained were $b = 0.00$, $t(121) = -0.00$, $p = 0.9$. In other words, every increase in score on the assimilator-explorer cognitive style variable is not followed by a significant change in the innovative work behavior score. The interaction value of the assimilator-explorer cognitive style is significant with LLCI and ULCI below 0. The results obtained are

F (3,121) = 4.76, R^2 = 0.03, b = -0.16, t (121) = -2.18, p = 0.03. In other words, the assimilator-explorer cognitive style is able to provide a moderating effect on the average score of the neuroticism dimension and innovative work behavior. Every 1 point increase in the assimilator-explorer cognitive style score will be followed by a 0.16 point decrease in the effect of the neuroticism dimension on innovative work behavior.

While in other personality dimensions there is no significant moderating effect. However, the results above are the interaction values that apply to the average score of the participants as a whole. If analyzed individually, the assimilator-explorer cognitive style is able to provide a moderating effect in several conditions. For the neuroticism dimension, the assimilator-explorer cognitive style is able to provide a moderating effect if the participant's cognitive style score is around 90.46 and 1 SD above 90.46. The assimilator-explorer cognitive style provides a moderating effect at t(121)= -2.38 to t(121)=-3.94 with a b coefficient of -0.30 to 2.37. For participants who are in this range of values, each increase of 1 score in the assimilator-explorer cognitive style changes -0.30 to 2.37 points in the neuroticism dimension effect on innovative work behavior. In the extraversion dimension, the assimilator-explorer cognitive style is able to provide a moderating effect only on participants who have an assimilator-explorer cognitive style score of 1 SD above 90.46, t(121)= 1.97 to t(121)=2.15 and a b coefficient of 0.02 to 1.56. In other words, every 1-point increase in the assimilator-explorer cognitive style score will be followed by an increase of 0.02 to 1.56 points in the effect of the extraversion dimension on innovative work behavior. Furthermore, in the agreeableness dimension, the assimilator-explorer cognitive style is able to provide a moderating effect only on participants who have an assimilator-explorer cognitive style score around 90.46. The assimilator-explorer cognitive style provides a moderating effect on t(121)= 1.97 to t(121) = 2.4 with a b coefficient of -0.85 to 0.4. For participants in this range of values, every 1-point increase in the assimilator-explorer cognitive style changes -0.85 to 0.4 the effect of the agreeableness dimension on innovative work behavior. In the conscientiousness dimension, the assimilator-explorer cognitive style is able to provide a moderating effect only on participants who have an assimilator-explorer cognitive style score around 90.46. The assimilator-explorer cognitive style provides a moderating effect on t(121) = 1.97 to t(121) = 2.5 with a b coefficient of -0.66 to 0.65.

For participants in the range of values, each increase of 1 score in the assimilator-explorer cognitive style changes -0.66 to 0.65 points of the effect of the conscientiousness dimension on innovative work behavior. In the openness dimension, it turns out that the assimilator-explorer cognitive style does not provide a moderating effect on the average score of participants or on individual scores. Furthermore, the researcher conducted additional analysis by comparing the demographic data scores with the variables of innovative work behavior and the assimilator-explorer cognitive style. The result was that there was no significant difference in scores between demographic data and innovative work behavior. However, there was a significant difference in scores between some demographic data and the assimilator-explorer cognitive style.

Table 2. Comparison of scores based on assimilator-explorer cognitive style

Demographics	Model	N	M	F	Information
Gender	Male, Female	92, 22	90.45, 91.32	F= 0.25, p = 0.61	Not Significant
Length of Work	< 2 years, 2-10 years, >10 years	2, 40, 70	84.50, 93.03, 89.34	F = 4.109, p = 0.019	Significant
Unit	Design, Production 1, Production 2, General, Engineering	33, 25, 27, 29	90.61, 87.96, 88.04, 95.31	F= 7.25, p = 0.00	Significant
Education	High School, Vocational School, Diploma, Bachelor's Degree, Master's Degree	21, 24, 18, 51, 2	85.90, 89.38, 90.39, 93.18, 94.00	F= 4.47, p = 0.00	Significant

Based on the table above, it can be seen that there is a significant difference between length of service, work unit and education based on the assimilator-explorer cognitive style. However, there is no significant difference in the demographic data of gender. Based on length of service, the highest average score of the assimilator-explorer cognitive style is at 2-10 years. Then based on the work unit, the general engineering division has the highest average score of the assimilator-explorer cognitive style. This means that participants in this division tend to have high cognitive style scores. Furthermore, based on education, it can be seen that the highest average score of cognitive style is in participants with a Masters degree.

3.5 Discussion

This study found that all personality dimensions were related to innovative work behavior except the openness dimension. This result is indeed different from previous studies. Madrid et al. (2012) and Kundu & Roy (2016) said that openness is correlated with innovative work behavior. According to researchers, the insignificance of the openness dimension can be caused by the difference between creativity and innovation. In theory, the openness dimension is related to creativity. The more dominant an individual is in this dimension, the higher the creative behavior displayed by the individual (George & Zhou, 2001). Individuals who are high in the openness dimension have the characteristics of being intelligent, imaginative, like to try many new things, and like freedom (McCrae & John, 1992). These characteristics have been widely associated with creativity. However, creativity is different from innovative work behavior. When viewed in terms of the stages of innovative work behavior, creativity only represents one stage (idea generalization). Creativity only emphasizes the creation of ideas and does not discuss how individuals realize these ideas (Hammond et al., 2011). This could be the reason why the openness dimension does not correlate with innovative work behavior. It is better to re-examine the relationship between the big five personalities at each stage of innovative work behavior. However, research on the stages of innovative work behavior cannot be done using the Janssen measuring instrument. The reason is that this measuring instrument views innovative work behavior as unidimensional. Janssen does not recommend testing the stages of innovative work behavior using this measuring instrument because the correlation between stages is too high (Janssen, 2000). A correlation that is too high can be assumed that the stages are not much different and actually measure the same thing. Further research on the stages of innovative work behavior can be done using other measuring instruments such as those developed by Kleysen & Street (2001) or De Jong & Den Hartog (2008).

Based on the results of the main analysis, it is known that the moderation effect only occurs in the neuroticism dimension with a negative correlation direction. This means that a high explorer style will reduce the influence of the neuroticism dimension on innovative work behavior. While the assimilator style will increase the influence of the neuroticism dimension on innovative work behavior. This result is quite unique because many previous studies have not discussed the role of neuroticism for cognitive style and innovative work behavior. In addition to the neuroticism dimension, the assimilator-explorer cognitive style provides a moderating effect on other personality dimensions under certain conditions. For example, the moderating effect on the extraversion dimension is significant in individuals with cognitive style scores above 90.46. In other words, one of the reasons why the assimilator-explorer cognitive style does not provide a moderating effect is the uneven distribution of cognitive style scores in the participants of this study. As previously mentioned, only 4 individuals were included in the explorer cognitive style group and the rest were included in the assimilator cognitive style group. The researcher assumes that the uneven conditions of the participants in terms of cognitive style resulted in an insignificant moderating effect. Further research should consider demographics and organizational factors in order to obtain more distributed cognitive style data between the assimilator and explorer styles.

Based on the theory, the explorer cognitive style is characterized as a cognitive style that is open to various alternative choices and flexible in solving problems (Kaufmann, 1979). The explorer cognitive style is better able to handle problems that have never happened before than the assimilator cognitive style (Martinsen, 1995). Individuals who are explorers will approach problems in a different way than assimilators. Basically, there is no cognitive style that is better than another cognitive style. All cognitive styles are adaptive depending on the existing situation (Messick, 1994). Therefore, it is actually not quite right to say that individuals with an explorer cognitive style will be better at solving problems than individuals with an assimilator style.

In addition to the measurement tool, researchers also consider the influence of large organizational factors. Initially, this study did emphasize individual factors. Researchers assume that cognitive style as an individual factor can strengthen the a relationship between big five personality and innovative work behavior. However, after seeing the results of the study, researchers consider that further research should also consider the role of organizational factors. This study involved divisions related to a production, design divisions and general engineering divisions. Two of these divisions are responsible for planning, producing goods and marketing the products of their divisions. Meanwhile, the design division is responsible for planning, research and development of overall production. Previous studies have shown that structured work environments that focus on the internal activities of their divisions tend to use adaptive patterns, while unstructured work environments and work that involves interaction with external parties tend to be more innovative (Chan, 1996). Examples of structured environments include banks, accountants, production companies, and others, while examples of unstructured environments include consultants, marketing, R&D and so on. Chan's research links the work environment with Kripton's adaptive-innovative cognitive style. Although different in terms of measurement, the theoretical basis of adaptive-innovative and assimilator-explorer is basically the same. Based on the results of this study, it can be assumed that the selection of divisions for the purpose of cognitive style research does indeed affect the results. In this study, the number of participants who fell into the assimilator cognitive style category was greater than participants with an explorer cognitive style. This can be attributed to more participants coming from divisions with structured work tasks. According to the results of additional analysis, it is also known that the difference in cognitive style scores of assimilators-explorers is significant based on length of service, vision and education. In other words, in addition to considering organizational factors, it is important for further research to also consider the demographics of length of service and education of participants.

4. Conclusion

Based on the results of data processing, the research problem can be answered with the statement that the assimilator-explorer cognitive style significantly moderates the relationship between the neuroticism personality dimension and innovative work behavior. The influence of the assimilator-explorer cognitive style has the opposite direction to the relationship between the neuroticism personality dimension and innovative work behavior. Individuals who are dominant in the neuroticism personality dimension are less able to display innovative work behavior. Conversely, individuals with a low neuroticism personality dimension type and have an explorer cognitive style tend to be able to behave innovatively.

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Author Contribution
This research was solely conducted by P.B.G.M.P, who was responsible for the conceptualization, methodology, data collection, data analysis, interpretation of results, and manuscript writing, including drafting and revisions.

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References
Ajzen, I. (2005). *Attitudes, personality, and behavior*. McGraw-Hill Education (UK).

Aron, A., Aron, E.N., & Coups, E. (2012). *Statistics for Psychlogy*. Pearson Higher Ed.

Baregheh, A., Rowley, J., & Sambrook, S. (2009). Towards a multidisciplinary definition of innovation. *Management decision*, *47*(8), 1323-1339. https://doi.org/10.1108/00251740910984578

Chan, D. (1996). Cognitive misfit of problem-solving style at work: A facet of person-organization fit. *Organizational Behavior and Human Decision Processes*, *68*(3), 194-207. https://psycnet.apa.org/doi/10.1006/obhd.1996.0099

Chen, S. C., Wu, M. C., & Chen, C. H. (2010). Employee's personality traits, work motivation and innovative behavior in marine tourism industry. *Journal of Service Science and Management*, *3*(2), 198. http://dx.doi.org/10.4236/jssm.2010.32025

De Jong, J. P., & Den Hartog, D. N. (2008). *Innovative work behavior: Measurement and validation*. SCALES. Zoetermeer.

Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual review of psychology*, *41*(1), 417-440. https://doi.org/10.1146/annurev.ps.41.020190.002221

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The mini-IPIP scales: tiny-yet-effective measures of the Big Five factors of personality. *Psychological assessment*, *18*(2), 192. https://psycnet.apa.org/doi/10.1037/1040-3590.18.2.192

Etikariena, A., & Muluk, H. (2014). Correlation between Organizational Memory and Innovative Work Behavior. *Makara Hubs-Asia*, *8*(3), 77-88. https://doi.org/10.7454/mssh.v18i2.3463

Feist, J., Feist, G. J., & Roberts, T. A. (2013). *Theories of personality (8th ed.)*. McGraw-Hill.

Forbes, F. (n.d). *5 reason why competition is good for your business*. Forbes.

George, J. M., & Zhou, J. (2001). When openness to experience and conscientiousness are related to creative behavior: an interactional approach. *Journal of applied psychology*, *86*(3), 513. https://psycnet.apa.org/doi/10.1037/0021-9010.86.3.513

Gravetter, F. J., & Forzano, L. B. (2012). *Research methods for the behavioral sciences*. Wadsworth, Cengage Learning.

Gravetter, F. J., & Wallnau, L. B. (2007). *Statistics for the behavioral sciences*. Belmont, CA: Thompson Learning.

Hammond, M. M., Neff, N. L., Farr, J. L., Schwall, A. R., & Zhao, X. (2011). Predictors of individual-level innovation at work: A meta-analysis. *Psychology of Aesthetics, Creativity, and the Arts, 5*(1), 90–105. https://psycnet.apa.org/doi/10.1037/a0018556

Hartog, D. N. D., & Jong, J. D. (2008). Innovative Work Behavior: Measurement and Validation. *Scientific Analysis of Entrepreneurship and SMEs*, 4-27. https://ideas.repec.org/p/eim/papers/h200820.html

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.

Jabri, M. M. (1991). The development of conceptually independent subscales in the measurement of modes of problem solving. *Educational and Psychological Measurement*, *51*(4), 975-983. https://psycnet.apa.org/doi/10.1177/0013164491051004l7

Janssen, O. (2000). Job demands, perceptions of effort-reward fairness and innovative work behaviour. *Journal of Occupational and organizational psychology*, *73*(3), 287-302. https://psycnet.apa.org/doi/10.1348/096317900167038

Kanter, R. M. (1988). Three tiers for innovation research. *Communication Research*, *15*(5), 509-523. https://psycnet.apa.org/doi/10.1177/009365088015005001

Kaufmann, G. (1979). The explorer and the assimilator: A cognitive style distinction and its potential implications for innovative problem solving. *Scandinavian Journal of Educational Research*, *23*(3), 101-108. https://doi.org/10.1080/0031383790230302

Kleysen, R. F., & Street, C. T. (2001). Toward a multi-dimensional measure of individual innovative behavior. *Journal of intellectual Capital*, *2*(3), 284-296. https://doi.org/10.1108/EUM0000000005660

Kundu, A., & Roy, D. D. (2016). Innovative Work Behaviour of School Teachers: Role of Belief for Innovation and Personality Patterns. *Journal of Organisation and Human Behaviour*, *5*(1). https://www.i-scholar.in/index.php/johb/article/view/118794

Madrid, H. P., Patterson, M. G., Birdi, K. S., Leiva, P. I., & Kausel, E. E. (2014). The role of weekly high-activated positive mood, context, and personality in innovative work behavior: A multilevel and interactional model. *Journal of Organizational Behavior*, *35*(2), 234-256. https://psycnet.apa.org/doi/10.1002/job.1867

Martinsen, Ø. (1995). Cognitive styles and experience in solving insight problems: Replication and extension. *Creativity Research Journal*, *8*(3), 291-298. https://psycnet.apa.org/doi/10.1207/s15326934crj0803_8

Martinsen, Ø., & Diseth, Å. (2011). The assimilator–explorer cognitive styles: Factor structure, personality correlates, and relationship to inventiveness. *Creativity Research Journal*, *23*(3), 273-283. https://psycnet.apa.org/doi/10.1080/10400419.2011.595998

Martinsen, O., Kaufmann, G., & Furnham, A. (1999). Cognitive style and creativity. In *Encyclopedia of creativity*. Imprint: Academic Pres.

Martinsen, Y. (1993). Insight problems revisited: The influence of cognitive styles and experience on creative problem solving. *Creativity Research Journal*, *6*(4), 435-447. https://doi.org/10.1080/10400419309534498

McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of personality*, *60*(2), 175-215. https://psycnet.apa.org/doi/10.1111/j.1467-6494.1992.tb00970.x

Messick, S. (1984). The nature of cognitive styles: Problems and promise in educational practice. *Educational psychologist*, *19*(2), 59-74. https://psycnet.apa.org/doi/10.1080/00461528409529283

Messick, S. (1994). The matter of style: Manifestations of personality in cognition, learning, and teaching. *Educational Psychologist*, *29*(3), 121-136. https://doi.org/10.1207/s15326985ep2903_2

Patterson, F., Kerrin, M., & Gatto-Roissard, G. (2009). *Characteristics and behaviours of innovative people in organisations.* Literature Review prepared for the NESTA Policy & Research Unit, 1-63.

Putri, A., & Etikariena, A. (2013). *Pengaruh trait kepribadian big five terhadap perilaku inovatif karyawan di tempat kerja pada PT X dan PT Y*. Universitas Indonesia. https://lontar.ui.ac.id/detail?id=20347733&lokasi=lokal

Roberts, B. W., & Mroczek, D. (2008). Personality trait change in adulthood. *Current directions in psychological science*, *17*(1), 31-35. https://psycnet.apa.org/doi/10.1111/j.1467-8721.2008.00543.x

Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of management journal*, *37*(3), 580-607. https://psycnet.apa.org/doi/10.2307/256701

Wilson, R. A., & Clark, A. (2009). *How to situate cognition: Letting nature take its course*. https://psycnet.apa.org/record/2009-00004-004

Widhiarso, W. (2009). *Prosedur Analisis Regresi dengan Variabel Moderator Tunggal melalui SPSS*. Universita Gadjah Mada.

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