



## Big Five personality traits in inmates and normal adults in Japan

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### ABSTRACT

The purpose of this study was to investigate differences in personality traits among violent, theft, and illegal drug use criminals, comparing them with normal adults. Inmates ( $N = 645$ ) and normal adults ( $N = 4546$ ) in Japan responded to a questionnaire, including the Big Five personality traits. Results indicated that violent criminals tended to show lower Agreeableness and higher Extraversion than other criminals. Theft criminals tended to display low Conscientiousness. Illegal drug use criminals showed higher Extraversion and Openness. Inmates tended to show higher Extraversion, Agreeableness, Openness, and Conscientiousness than normal adults. Characteristics of personality traits of criminals were discussed.

### 1. Introduction

There is a certain number of criminals who are imprisoned again after completing their jail terms and getting out of prison. For example, in the United States, a study of offenders, who were released from prison after serving a sentence of imprisonment in 2005, reported that 49.3% of offenders were rearrested within 8 years (Hunt & Dumville, 2016). In Japan, among those who were released from prison in 2006, the ratio who became inmates again, within 10 years, was 47.6% (Research and Training Institute, Ministry of Justice, Japan, 2016). Taking the above fact into consideration, how The Ministry of Justice, Japan, will prevent the repetition of crimes is a major challenge for the construction of a society where people can live safely in peace. There are various factors involved in committing a crime; however, to prevent re-offending, it is necessary to take an effective approach to each individual's problem, as well as to give guidance and support to overcome their problems. Therefore, Japanese prisons are seeking to enhance effective treatment based on research, according to individual offender's characteristics. This study examines personality characteristics of criminals for each type of offense, comparing their personality traits with normal adults. Personality traits play an important role to understand the addictive nature and genetic factors of criminals because of their stability across the lifespan and relationships with genes and the central nervous system (Miller, Lynam, & Leukefeld, 2003).

Many psychologists now agree that the Big Five personality traits (Goldberg, 1990; McCrae & John, 1992) constitute an important overall

personality structure of an individual's personality. The Big Five personality traits represent Openness (e.g., intellectual curiosity and creativity), Conscientiousness (e.g., orderliness and persistence), Extraversion (e.g., sociality and positive affect), Agreeableness (e.g., cooperation and trust), and Neuroticism (e.g., anxiety, depression, and emotional instability), and their scores are relatively stable across the life span (Roberts & DelVecchio, 2000). The five-dimension structure is found across different cultures (e.g., McCrae, Terracciano, & 78 Members of the Personality Profiles of Cultures Project, 2005) and a behavioral genetic study also supports them (Yamagata et al., 2006).

The Big Five personality traits link to antisocial behaviors. Large-scale longitudinal studies in Estonia (Mõttus, Guljajev, Allik, Laidra, & Pullmann, 2012) and in the United Kingdom (O'Riordan & O'Connell, 2014) showed that oncoming antisocial behaviors are significantly affected by low Agreeableness and Conscientiousness, and high Neuroticism. Meta-analytic research, aggregating 15 studies (Miller & Lynam, 2001) and 30 studies (Jones, Miller, & Lynam, 2011), also concluded that low Agreeableness and Conscientiousness, and high Neuroticism predicts antisocial behaviors.

Some studies, which examined the differences of personality traits between inmates and normal adults, reported that the criminals show higher Agreeableness and Conscientiousness than the normal adults. For example, previous studies in Croatia (Trninić, Barančić, & Nazor, 2008) and in Belgium (Thiry, 2012) reported that inmates show higher Agreeableness and Conscientiousness than normal adults. Another previous study in Sweden (Eriksson, Masche-No, & Dåderman, 2017)

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reported that prisoners show lower Agreeableness than non-prisoners, but there is no significant difference of Conscientiousness between them. These results contradict the findings of the relationship among Agreeableness, Conscientiousness, and antisocial behaviors, and they are inconsistent with the theoretical concepts of Agreeableness and Conscientiousness (Eriksson et al., 2017). Therefore, these results possibly do not indicate that the characteristics of inmates relate to Agreeableness and Conscientiousness, but that they represent impression management to reduce their sentence and an adaptation to the rigorous discipline of prison. Eriksson et al. (2017) showed that there are no significant effects of impression management on the difference in personality traits between inmates and normal adults, indicating an adaptation to the prison. Interpretation of personality characteristics of inmates is, thus, a problem that requires attention (Eriksson et al., 2017).

In the present study, we examine the personality characteristics of inmates across categories of crime. As mentioned above, previous studies focused on the differences in personality traits only between inmates and normal adults; and did not examine the differences among categories of crime. Etiology of antisocial behaviors differ according to the features of crime (e.g., violent crime vs. non-violent crime), and personality characteristics may be different across the categories of crime (e.g., Burt, 2009). Violent crime, theft crime, and illegal drug use are typical and major crimes in many countries (e.g., US, Dillinger, 2017; Japan, Research and Training Institute, Ministry of Justice, Japan, 2016). Therefore, we focus on these three categories of crime and compare of criminals' personality traits with those of normal adults.

## 2. Method

### 2.1. Inmates

The sample of inmates was new inmates who entered 77 prisons, except for medical prisons and detention centers, in Japan. The questionnaire survey was administered in June 2016 for males and from June to July 2016 for females. It was a part of large survey at the beginning of new executions. All the participants spoke Japanese and those who were thought not to use Japanese were eliminated from the survey. Office staffs in each prison administered the questionnaire. Participants rated the questionnaire in their room or teaching classroom. They were informed about the nature of the survey, asked to consent, and if provided, started to complete the survey. This survey was conducted in the projects, Survey of Characteristics of Violent Criminals, and General Survey of Repeat Offenders and Prevention of Recombitment, which were implemented by Research and Training Institute, Ministry of Justice.

In this study, 967 were asked to respond the questionnaire, and 106 of them did not complete it (response rate was 89.0%. Of the 861 inmates, 645 participants (504 males and 141 females), who were categorized into each kind of criminals, were included in the following analyses. Of the participants, 176 people (159 males and 17 females) were violent criminals, 262 people (192 males and 70 females) were theft criminals, and 207 people (153 males and 54 females) were illegal drug use (Stimulants Control Act violation) criminals. The classification of inmates was based on their main offense (i.e., the penalty with the most serious sentence).<sup>1</sup> Mean age was 43.8 years ( $SD = 13.5$ ), and the range of age was from 20 to 69 years old. Mean ages for each group were 40.4 ( $SD = 13.8$ ) years old for violent criminals, 16.7 ( $SD = 15.3$ ) years old for theft criminals, and 42.9 years old ( $SD = 9.4$ ) for illegal

drug criminals.<sup>2</sup>

### 2.2. Normal adults

As a control group, we used a large dataset of Japanese adults, which was collected using an online survey. Participants were 7933 Japanese adults who participated in the Data-Sharing for Psychology in Japan (DSPJ) project. For this project, the participants were recruited from an Internet survey panel by Cross Marketing, Inc. (a major Japanese Internet survey company), which has approximately 3.8 million people in the pool of participants. Participants received a small monetary compensation for their participation. The participants were provided with a privacy policy and informed consent was obtained. We eliminated responses with missing values, overlaps, and giving a wrong answer to an instructed response item (Huang, Curran, Keeney, Poposki, & DeShon, 2012; Kung, Kwok, & Brown, 2018), because these insufficient responses will cause misunderstanding findings (e.g., Huang, Liu, & Bowling, 2015; Maniaci & Rogge, 2014). After the elimination, we used 4546 respondents (2660 males and 1886 females). Their mean age was 50.3 years ( $SD = 11.0$ ), and the range of age was from 18 to 71 years old.

### 2.3. Material

We used the Japanese version of the Ten-Item Personality Inventory (TIPI-J: Oshio, Abe, & Cutrone, 2012) in order to measure the Big Five personality dimensions (i.e., Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness). The TIPI-J is a Japanese-translated version of TIPI (Gosling, Rentfrow, & Swann, 2003) and it consists of five pairs of items; one item in each pair is reverse-coded. Responses were reported used a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The TIPI-J has only two items for each domain, so within-scale inter-item correlations are appropriate for evaluating the internal consistency of each scale, rather than Cronbach's alpha coefficients (Oshio, Abe, Cutrone, & Gosling, 2013, 2014; Oshio et al., 2012). In this study, the within-scale correlation coefficients between positively and negatively coded items in each pair ranged from  $r = -.34$  (Extraversion) to  $r = -.16$  (Openness) for criminals, and from  $r = -.45$  (Extraversion) to  $r = -.20$  (Agreeableness) for normal adults, resembling results from previous studies (Oshio et al., 2012; Oshio et al., 2013, 2014).

## 3. Results

### 3.1. Confirmatory factor analysis

There is a possibility that the factor structures of the Big Five personality traits are different between the normal adults and inmates. In order to examine measurement invariance (Vandenberg & Lance, 2002), we tested a multi-group confirmatory factor analysis for the Big Five personality structure based on the TIPI-J. For the analysis, we tested five models; the first model was set with no equivalence hypothesized between normal adults and inmates,  $\chi^2(46) = 1779.21$ ,  $p < .001$ , CFI = .82, RMSEA = .085, 90% CI = [.082–.089]; the second model hypothesized about the same factor loadings, and factor loadings from each factor on observed variables were equalized between the groups,  $\chi^2(51) = 1792.20$ ,  $p < .001$ , CFI = 0.82, RMSEA = .081, 90% CI = [.078–.084]; the third model hypothesized

<sup>1</sup> There are less illegal drug users among violent criminals and theft criminals in Japan than Western countries. In this study, we asked the violent and theft criminals whether they used illegal drugs in the last twelve months, and the answer was that only 23.3% of the violent criminals and 10.3% of theft criminals had the experience to use illegal drugs.

<sup>2</sup> Mean age of inmates is higher in Japan than other countries. For example, the percentage of inmates who were over the age of 50 was 32.0% in Japan and 18.4% in the US in 2013. (Carson & Sabol, 2016; Judicial System and Research Department, Ministry of Justice, Japan, 2013). One of the main reasons seems that Japan has a higher age structure of the population than other countries (Cabinet Office, Japan, 2018).

about scalar invariance and item intercepts were constrained to be equal between the groups in addition to the second model,  $\chi^2(61) = 2242.89, p < .001, CFI = .77, RMSEA = .083, 90\% CI = [.080-.086]$ ; and the fourth model hypothesized about strict invariance and item residual variances were equalized between the groups,  $\chi^2(71) = 2468.21, p < .001, CFI = .75, RMSEA = .081, 95\% CI = [.078-.083]$ .<sup>3</sup> Because Model 2 with the same factor loadings showed the best fit of the four, we tested the fifth model, in which all the covariances were constrained to be equal between the groups in addition to the second model,  $\chi^2(61) = 1816.76, p < .001, CFI = .82, RMSEA = .074, 90\%CI = [.072-.079]$ . The fifth model had the best fit from the viewpoint of RMSEA. These results indicated that the normal adults and inmates show same factor structures of the Big Five personality traits.

### 3.2. Correlations and differences of correlations between the groups

In order to examine the relationships among the Big Five personality traits for the normal adults and inmates, we calculated correlation coefficients among Big Five scores and differences of the coefficients between them (see Table 1). Almost all correlation coefficients were equal between the groups, except for the correlations between Extraversion and Conscientiousness, and Conscientiousness and Neuroticism. These results indicate that the inter-dimensional relationships of the TIPI-J is almost equivalent between the normal adults and inmates.

### 3.3. Mean differences of Big Five among the groups

We performed a MANCOVA with two groups (normal adults and inmates) and sex as the independence variables, with Big Five personality traits as the dependent variables, and age as covariate. Significant multivariate effects were found for sex (Hotelling's  $T^2 = 0.02, \eta_p^2 = 0.014$ ) and the groups (Hotelling's  $T^2 = 0.05, \eta_p^2 = 0.047$ ). The imprisoned criminal group was higher on Extraversion,  $F(1, 5153) = 83.28, p < .001, \eta_p^2 = 0.016$ , Agreeableness,  $F(1, 5153) = 84.87, p < .001, \eta_p^2 = 0.016$ , and Openness,  $F(1, 5153) = 22.35, p < .001, \eta_p^2 = 0.004$ , than normal adults. Females showed higher Neuroticism,  $F(1, 5153) = 26.27, p < .001, \eta_p^2 = 0.005$ , and lower Openness,  $F(1, 5153) = 20.77, p < .001, \eta_p^2 = 0.004$ . There were no significant interactive effects of the group and sex on the Big Five personality traits.

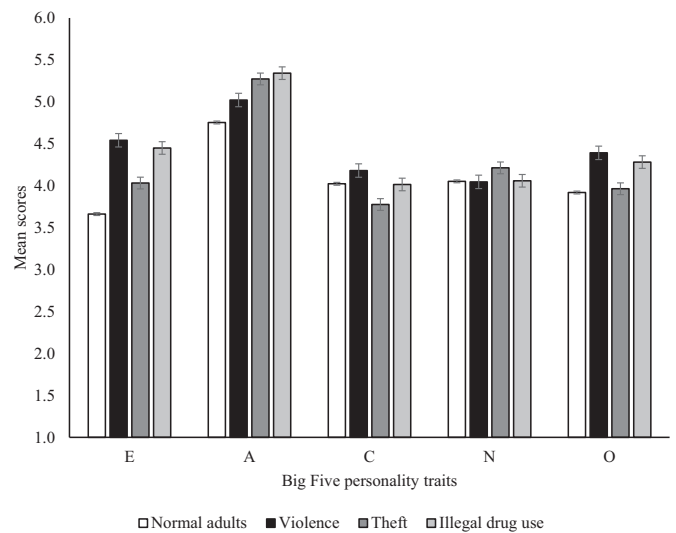
Subsequently, in order to examine mean differences in the Big Five traits among the normal adults and three types of crimes, we conducted a MANCOVA with four groups (normal adults, inmates of violence, theft, and drug) as the independent variables, Big Five personality traits as the dependent variables, and sex and age as covariates. Fig. 1 shows average scores of Big Five for each group. A multivariate effect of the groups was significant (Hotelling's  $T^2 = 0.08, p < .001, \eta_p^2 = 0.025$ ). Violent and illegal drug use criminals showed higher Extraversion than theft criminals and normal adults, and the average score of theft criminals was higher than normal adults,  $F(3, 5152) = 48.31, p < .001, \eta_p^2 = 0.027$ . Illegal drug use and theft criminals showed higher Agreeableness than violent criminals and normal adults, and the violent criminals showed higher Agreeableness than the normal adults,  $F(3, 5152) = 41.72, p < .001, \eta_p^2 = 0.024$ . For Conscientiousness, the average score of violent criminals and normal adults was higher than that for theft criminals,  $F(3, 5152) = 5.14, p < .01, \eta_p^2 = 0.003$ . Violent and illegal drug use criminals showed higher Openness than theft criminals and normal adults,  $F(2, 5152) = 14.52, p < .001, \eta_p^2 = 0.008$ . There were no significant differences in Neuroticism among the groups,  $F(3, 5152) = 1.65, n.s., \eta_p^2 = 0.001$ .

<sup>3</sup> We also set four covariances between residuals of items based on the correlation matrix of the items, indicating similarity of item wording, format, and so on between them.

**Table 1**  
Correlation coefficients among Big Five traits for normal adults and inmates.

		E	A	C	N	O	M	SD
E	Normal	-	-.01	.27	-.27	.36	3.67	1.28
	Inmates	-	.03	.37	-.32	.36	4.22	1.35
	z		-0.09	-2.59	1.27	0.00		
A	Normal		-	.26	-.30	.06	4.77	1.00
	Inmates		-	.27	-.31	.07	5.13	1.11
	z			-0.25	-0.26	-0.23		
C	Normal			-	-.38	.28	4.04	1.15
	Inmates			-	-.47	.29	3.83	1.20
	z				2.55	-0.25		
N	Normal				-	-.24	4.05	1.10
	Inmates				-	-.19	4.16	1.28
	z					-1.22		
O	Normal					-	3.91	1.09
	Inmates					-	4.23	1.20

Note. E = Extraversion. A = Agreeableness. C = Conscientiousness. N = Neuroticism. O = Openness. M = Mean. SD = Standard deviation. All correlation coefficients in boldface are significant ( $p < .01$ ). Normal = Normal adults ( $N = 4546$ ). Prisoners = New inmates ( $N = 612$ , because of missing values). z = difference in correlation coefficients between the groups. Z-values in boldface are significant ( $p < .01$ ).



**Fig. 1.** Mean scores of Big Five personality traits among the groups. Error bars indicate standard error.

## 4. Discussion

Although there have been some previous studies which focus on personality characteristics of criminals (Eriksson et al., 2017; Thiry, 2012; Trninić et al., 2008), few studies have examined personality across categories of crime. The present study compared mean scores of the Big Five personality among categories of violent, theft, and illegal drug use criminals. Like previous studies (Eriksson et al., 2017; Thiry, 2012; Trninić et al., 2008), we also examined the difference of personality traits between inmates and normal adults. In sum, the results indicated that there are significant differences among the categories of crime, and they clarify the characteristics of each crime.

The results in the present study showed that violent criminals have lower Agreeableness than other criminals and higher Extraversion than theft criminals. A previous meta-analysis (Vize, Miller, & Lynam, 2018) indicated that the Compliance facet of Agreeableness significantly predicts violent antisocial behaviors, rather than non-violent antisocial behaviors. Vize et al. (2018) showed that the Assertiveness facet of Extraversion is a significant predictor of antisocial behaviors with physical violence. These results suggest that violent criminals display

characteristics to have interpersonal problems and to force their views on others.

Results in this study showed that theft criminals have lower Conscientiousness than other criminals. A previous meta-analytic study (Vize et al., 2018) reported that low Conscientiousness, especially low Competence, Dutifulness, and Achievement Striving, tended to significantly predict non-violent antisocial behaviors. Of these facets of Conscientiousness, Dutifulness and Achievement Striving may be associated negatively with theft crime because theft is a behavior to accomplish a purpose in an unjust way. Theft criminals possibly disregard the rule and tend to use improper means as compared to other criminals.

In the present study, it was shown that illegal drug use criminals have higher Extraversion and Openness than theft criminals. A previous study (Vize et al., 2018) indicated that the Excitement-Seeking facet of Extraversion links to non-violent antisocial behaviors, while Openness has no significant effect on antisocial behaviors. Terracciano, Löckenhoff, Crum, Bienvu, and Costa (2008) examined relationships between the use of illegal drugs and the Big Five personality traits and reported that current marijuana users tended to score higher on the Excitement-Seeking facet of Extraversion than former users. The Aesthetics and Ideas facets of Openness were higher for marijuana users than non-users (Terracciano et al., 2008). In sum, illegal drug use criminals tend to seek more stimulus and aesthetic sense, and think they have intellectual abilities.

The result showed that inmates score higher on Extraversion, Agreeableness, and Openness than normal adults in this study, indicating slightly different associations as compared to previous studies (Eriksson et al., 2017; Thiry, 2012; Trninić et al., 2008). Eriksson et al. (2017) pointed out that personality differences between inmates and normal adults is influenced by adaptation to prison rather than impression management. Future studies should focus on difference in treatment in prison between Japan and other countries, and the possibility that the dissimilarity of the results reflects the difference in treatment. For example, Japanese prisoners are basically accommodated in group rooms, whereas inmates in European countries are housed in a single room.

There are some limitations in the present study. First, we did not use facets of the Big Five personality traits. As reported by Vize et al. (2018), some facets are clearly associated with antisocial behaviors. In future studies, other Big Five questionnaires that can also assess facet factors should be used to clarify relationships between personality traits and criminality. Second, we did not control each inmate's length of sentence as a ruling. In the present study, the survey was conducted in the beginning of new executions, and that means the period of time after entering the jails was controlled. However, it is possible that the inmates show an adaptation to prison when they recognize their length of sentence. Future studies should statistically control it. Third, the correlation coefficient between the correspondent items of Openness was lower for the inmates than the normal adults. The low correlation coefficient may have an influence on the results in the present study. The TIPI-J is a very brief and convenient measure of the Big Five personality. The use of short measures possibly increases both the Type 1 and Type 2 error rates (Credé, Harms, Niehorster, & Gaye-Vlentie, 2012), while TIPI-J has good evidences of validity (Oshio et al., 2012; Oshio et al., 2013, 2014). Future studies should examine the reproducibility using other Big Five measures. Fourth, this study did not examine the characteristics within each category of crime. For example, in violent crime, murder is a more serious crime than bodily harm and they may relate to different characteristics of personality traits. In theft crime, there may be differences in personality traits between burglary and motor vehicle theft. Future studies should focus on the details of criminal categories in order to clarify characteristics of criminals in more detail.

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