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1. Introduction

In this study, the results of a preliminary analysis of self-reported delinquency as measured in the International Self-Report Delinquency Study (ISRD3) are examined. According to Thornberry and Krohn (2000), the self-reported method—initiated by Hirschi (1969) and imperative in empirical research on youth crime and delinquency—is "one of the most important innovations in criminological research in the 20th century."

Only a few studies, employing data from social surveys in Japan, have examined the validity of the self-reported delinquency scale. The ISRD3 data are useful for examining the self-reported delinquency scale's validity.

The ISRD3 questionnaire comprises 14 items related to delinquency experiences. If respondents answered in the affirmative, they were asked to specify the number of times they committed the particular act in the previous ye ar. This process is similar to several studies on delinquency that have used the number of times an act was committed in the previous year in analyses. Number of acts in previous year is considered to be 0 if respondents indicate that they have never committed a particular act before. Furthermore, if even 1 of the 14 items about previous experience has not been answered, the answer is regarded as no experience. This type of processing was conducted in 25 cases.

2. Basic tabulation

The self-reported number of times an act was committed in the previous year for boys and girls are displayed in Table 1. The minimum value for each item for boys and girls is 0. The maximum, mean, and standard deviation are presented in Table 2. The most common response for all items was never.

Table 1 Frequency distribution of 14 items on self-reported delinquency

		Never	Once	2 times	3-4 times	5-9 times	>=10 times	NA	Total
Graffiti	Total	95.4	1.1	0.7	0.4	0.1		2.4	100.0
	Male	93.6	0.9	0.9	0.6	0.2		3.8	100.0
	Female	97.3	1.2	0.5	0.2			0.8	100.0
Vandalism	Total	97.2	0.2	0.2				2.4	100.0
	Male	95.8	0.3	0.3				3.6	100.0
	Female	98.8		0.2				1.0	100.0
Shoplifting	Total	96.2	0.9	0.2	0.2		0.2	2.2	100.0
	Male	94.8	0.8	0.3	0.2		0.5	3.5	100.0
	Female	97.8	1.0	0.2	0.2			0.8	100.0
Burglary	Total	97.7	0.2					2.1	100.0
	Male	96.5	0.2					3.3	100.0
	Female	99.0	0.2					0.8	100.0
Bike theft	Total	97.6	0.2			0.1		2.1	100.0
	Male	96.2	0.3			0.2		3.3	100.0
	Female	99.0	0.2					0.8	100.0
Vehicle theft	Total	97.6	0.1		0.1			2.2	100.0
	Male	96.5	0.2					3.3	100.0
	Female	98.8			0.2			1.0	100.0
Car braak	Total	97.8	0.1					2.1	100.0
	Male	96.7						3.3	100.0
	Female	99.0	0.2					0.8	100.0

Table 1 Frequency distribution of 14 items on self-reported delinquency (cont.)

		Never	Once	2 times	3-4 times	5-9 times	>=10 times	NA	Total
Robbery/ extortion	Total	97.7	0.2					2.1	100.0
	Male	96.5	0.2					3.3	100.0
	Female	99.0	0.2					0.8	100.0
Stealing from a person	Total	95.8	1.0	0.1	0.5	0.2	0.2	2.2	100.0
	Male	94.0	1.6	0.2	0.6	0.3		3.3	100.0
	Female	97.8	0.3		0.3	0.2	0.3	1.0	100.0
Carrying weapon	Total	96.0	0.4	0.3	0.2	0.1	0.7	2.4	100.0
	Male	94.2	0.8	0.5	0.2	0.2	0.6	3.6	100.0
	Female	98.0		0.2	0.2		0.7	1.0	100.0
Group fight	Total	94.2	1.5	1.0	0.4	0.2	0.2	2.4	100.0
	Male	91.8	1.6	1.6	0.6	0.3	0.3	3.8	100.0
	Female	96.8	1.4	0.3	0.2	0.2	0.2	1.0	100.0
Assault	Total	97.1	0.4		0.1	0.2	0.1	2.2	100.0
	Male	95.1	0.8		0.2	0.3	0.2	3.5	100.0
	Female	99.2						0.8	100.0
Illegal downloading	Total	92.8	0.8	0.4	0.5	0.6	2.1	2.8	100.0
	Male	90.9	0.9	0.2	0.3	0.9	3.0	3.8	100.0
	Female	94.9	0.7	0.7	0.7	0.2	1.2	1.7	100.0
Drug dealing	Total	97.8		0.1				2.1	100.0
	Male	96.5		0.2				3.3	100.0
	Female	99.2						0.8	100.0

Table 2 Descriptive statistics of 14 items on self-reported delinquency

		Graffiti	Vandalism	Shoplift	Burglary	Bike theft	Vehicle theft	Car braak
Total	Max	5	2	50	1	5	3	1
	Mean	0.0	0.0	0.1	0.0	0.0	0.0	0.0
	SD	0.32	0.11	1.60	0.04	0.15	0.09	0.03
	n	1197	1197	1199	1200	1200	1199	1200
Male	Max	5	2	50	1	5	1	0
	Mean	0.1	0.0	0.2	0.0	0.0	0.0	0.0
	SD	0.40	0.13	2.23	0.04	0.21	0.04	0.00
	n	613	614	615	616	616	616	616
Female	Max	3	2	3	1	1	3	1
	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SD	0.22	0.08	0.18	0.04	0.04	0.12	0.04
	n	584	583	584	584	584	583	584

Table 2 Descriptive statistics of 14 items on self-reported delinquency (cont.)

		Robbery/ extortion	Steal from a person	Carrying weapon	Group fight	Assault	Illegal download	Drug dealing
Total	Max	1	10	365	50	15	300	2
	Mean	0.0	0.1	1.0	0.1	0.0	1.2	0.0
	SD	0.04	0.57	18.38	1.58	0.50	11.58	0.06
	n	1200	1199	1197	1196	1199	1192	1200
Male	Max	1	8	365	50	15	128	2
	Mean	0.0	0.1	0.7	0.2	0.1	1.5	0.0
	SD	0.04	0.48	14.75	2.13	0.69	10.20	0.08
	n	616	616	614	613	615	613	616
Female	Max	1	10	365	12	0	300	0
	Mean	0.0	0.1	1.4	0.1	0.0	0.9	0.0
	SD	0.04	0.66	21.56	0.57	0.00	12.88	0.00
	n	584	583	583	583	584	579	584

Notably, the maximum value of carrying weapon was 365 times. Although the maximum value was extremely large in some cases, it was difficult to determine whether the answers in these cases differed from the actual situation as responses were self-reported and based on memory.

3. Comparisons with Previous Surveys

We compared the results of ISRD3 with those of similar surveys. In 2009, the Japanese Cabinet Office conducted a survey among young people throughout Japan. This was the most recent large-scale survey that involved youth of different ages—from elementary school children to university students. Approximately 2,900 junior high school students completed this survey. Although the target population was students enrolled in 29 junior high schools, random sampling was not employed.

A discussion of the results of items that are similar to ISRD3 was conducted. In both surveys, the respondents were asked about their previous year experiences. The Cabinet Office survey revealed that 3% and 1.9% of boys and girls, respectively, had engaged in shoplifting in the previous year. The results further revealed that 1.6% and 0.6% of boys and girls, respectively, had committed robbery/extortion. Additionally, 1.8% of boys and 0.6% of girls acknowledged they had carried weapon (specifically, a knife). Comparing the 2009 Cabinet Office data and our ISRD3 data revealed a difference of 1.4 points, thus showing the same approximate trend of delinquency.

4. Item analysis

The boys' data from ISRD3, which included 601 cases from the previous year involving all 14 items, were analyzed. However, because none of the boys had committed a car break in the previous year, this item was excluded. Then, item analysis was performed on the remaining 13 items.

The number of times an act was committed in the previous year was classified into four categories: 0, 1, 2, and 3 or more times. The points assigned to each category corresponded to the number of times an act was committed; for instance, 3 points were allocated if a respondent had committed a particular act 3 or more times in the previous year. Then, the incidence score was calculated by adding up these scores for each case. The descriptive statistics of this score are as follows:

Minimum value: 0
Maximum value: 11
Median: 0
Mean: 0.43
SD: 1.289

The correlation coefficients between the incidence scores and each item (0–3 points), as well as the two-tailed probability of significance, are presented in Table 3. The correlation coefficients between the incidence score and burglary and between the incidence score and robber/extortion were both nonsignificant at the 5% level. The correlation between the other items and incidence scores were all significant at the 5% level.

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Table 3 Correlation between the incidence score and each item

	Graffiti	Vandalism	Shoplift	Burglary	Bike theft	Vehicle theft
Corr.	0.52	0.37	0.32	0.05	0.17	0.24
p value	<0.001	<0.001	<0.001	0.224	<0.001	<0.001

	Robbery/ extortion	Steal from a person	Carrying weapon	Group fight	Assault	Illegal download	Drug dealing
Corr.	0.02	0.47	0.47	0.42	0.32	0.65	0.15
p value	0.660	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Cronbach's alpha for all 13 items (0–3 points each) was 0.43; it was 0.43 for 12 items excluding burglary, 12 items excluding robbery/extortion, and 11 items excluding both burglary and robbery/extortion.

5. Estimation of the degree of delinquency using item response theory

The incidence scores do not reflect any information on the seriousness of delinquency; thus, the construct validity of this scale may be low. By applying item response theory (IRT), the degree of delinquency can be estimated by considering each item's seriousness. As per Osgood et al. (2002), the latent trait θ obtained by applying IRT is a value that indicates a respondent's degree of delinquency. Item difficulty reflects the difficulty of delinquency of each item that constitutes the scale, that is, the seriousness of delinquency. Item discrimination is an indication of the strength of the association between the latent trait θ measured by the scale and the item in question.

The graded response model (Samejima 1969) with two parameters was applied to the 13-item data. Exametrika ver. 5.5 (available at http://antlers.rd.dnc.ac.jp/~shojima/exmk/jindex.htm) was utilized for the calculations. The CFI and RMSEA of the obtained model were 1.00 and 0.08, respectively. There were no issues with the model fit.

Table 4 Parameters obtained by applying IRT

	Item discrimination	Item difficulty		
		>=1	>=2	>=3
Illegal downloading	1.31	*1.63*	*1.73*	*1.75*
Graffiti	1.04	1.93	2.13	2.39
Carrying weapon	0.95	1.99	2.17	2.33
Stealing from a person	0.94	1.93	2.33	2.39
Group fight	0.85	*1.73*	*1.93*	*2.27*
Vandalism	0.73	2.48	**2.71**	
Shoplifting	0.64	2.17	2.48	**2.71**
Assault	0.63	2.22		2.58
Vehicle theft	0.48	**2.94**		
Bike theft	0.34	2.58		2.94
Drug dealing	0.29		**2.94**	
Burglary	0.10	2.94		
Robbery/extortion	0.04	2.94		

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The parameters obtained by applying IRT are presented in Table 4. The parameters are shown in order of increasing item discrimination. The items with the highest item discrimination included illegal downloading, graffiti, carrying weapon, and stealing from a person.

Item difficulty indicates the degree of difficulty in committing each delinquent act. In Table 4, the top two items in each column are displayed in bold, and the bottom two items are underlined in italics. Vehicle theft, bike theft, drug dealing, burglary, and robbery/extortion had high values, revealing that the seriousness of these delinquencies was relatively high.

Figure 1 depicts the change in item difficulty for six items, including illegal downloading. While there are items such as shoplifting where the item difficulty increases with the number of times, in other items, for example, illegal downloading, the item difficulty does not change significantly.

The calculated descriptive statistics of latent trait θ for each respondent are as follows:

Minimum value: −1.8
Maximum value: 3.2
Median: 1.2
Mean: 1.08
SD: 1.164

Pearson's correlation coefficient between latent trait θ and the incidence score was 0.94, revealing a fairly strong correlation. Therefore, it is permissible to use the incidence score when conducting an analysis based on the ISRD3 data with the degree of delinquency as the dependent variable. However, as shown in the scatter plot in Figure 2, there is a discrepancy between the two. When the seriousness of delinquency is considered in the analysis, it is more appropriate to use the latent trait θ.
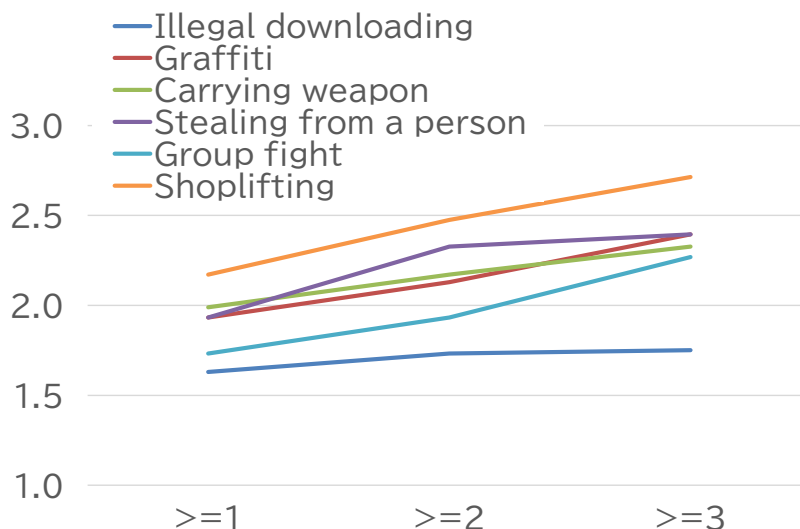

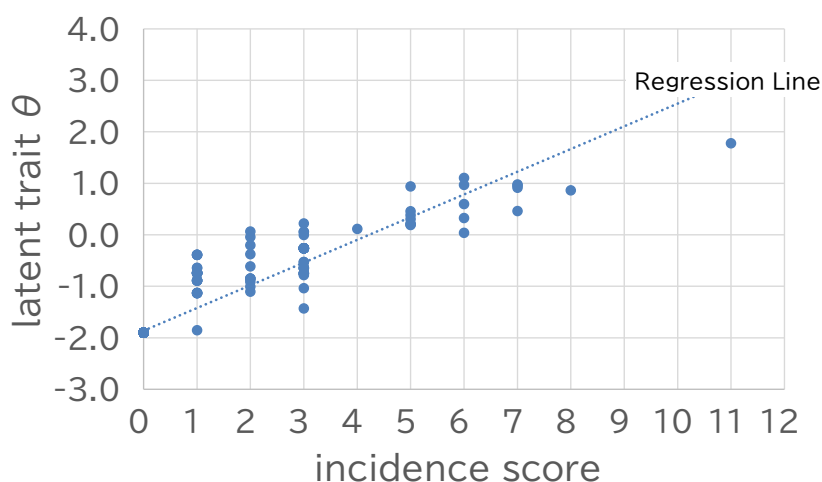**Figure 1** Item difficulty parameters of 6 items

Figure 2 Scatter plot of incidence score and latent trait θ

6. Conclusion and future issues

The main findings of the study are as follows:

1) To measure delinquency properly, it is imperative that illegal downloading, graffiti, carrying weapon, and stealing from a person be included as items.

2) Vehicle theft, bike theft, drug dealing, burglary, and robbery/extortion are very serious.

3) It is not problematic to use an incidence score that simply adds up the values for the responses of the 14 delinquency items.

It is difficult to ask many questions about delinquency in a general social survey of the youth. For researchers to conduct a more details analysis, it is imperative to develop a validated self-reported delinquency scale with fewer items.

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