

Misconceptions about Modern Psychology among Japanese First-Year University Students

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This study investigates Japanese first-year university students' misconceptions about psychology. In addition, we compared their misconceptions to those of correspondence course students who were adults in the workforce and had already received a psychological education. The participants were 251 first-year university students (FY group) and 32 correspondence course students (CC group). They answered a questionnaire consisting of 30 items regarding psychology. Results indicated that the average correct answer rate for the FY group (42.73%) was lower than that of the CC group (70.31%). Analysis of the results regarding the field of psychology indicated that the FY group had a high rate of incorrect answers in "Clinical Psychology" and "Social Psychology," whereas the incorrect answer rate for the CC group indicated no bias. This difference is attributed to both the CC group's educational experience in psychology and their social experience as members of society. It was concluded that first-year university students have many misconceptions about psychology, and that sufficient consideration is required in university psychology education.

Key words: misconceptions, university psychology education, common-sense psychology, popular psychology

Even people who do not receive an education in psychology create their own psychological beliefs based on personal experiences (e.g., influence from family and friends, information from the media, and Internet resources). This is due to the fact that our everyday life is filled with psychological phenomena, and we try to make adaptations by understanding such phenomena. The belief system about such workings of the human mind is called "common-sense psychology" (Kelly, 1992), "popular psychology" (Lilienfeld, Lynn, Ruscio, and Beyerstein, 2010), or "lay psychology" (Fukuda, 1987). Because the media focuses on the amusement aspect of psychology and takes it up out of mere curiosity, "common-sense psychology" lacks generality, provides subjective views

without scientific evidence, and is often invalid from the perspective of modern psychology.

First-year university students are thought to create their own psychological beliefs. In some western countries, psychology classes are part of the curriculum at educational institutes corresponding to Japanese senior high school. However, in Japan, there are no psychology classes in senior high school, although some psychological topics are addressed as part of ethics, biology, or health and physical education. Takahashi and Nihei (2010) researched all ethics and social studies textbooks used in Japanese senior high schools in 2009, and found that many statements regarding psychology were obviously mistaken or worded in a misleading manner. Because ethics and social

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studies is not a compulsory subject in senior high school, many students take up psychology as a regular subject only after entering university. Even if a student took an ethics and social education class in senior high school, there is a risk of learning incorrect psychological knowledge.

In giving lectures about "Psychology" or "Introduction to Psychology" in the university, it is important to understand students' misconceptions about psychology. Several quiz-format tests to evaluate such misconceptions have been developed (e.g., Holley and Buxton, 1950; Vaughan, 1977; Fukuda, 1987; Tajimi, Kijima, Yamashita, and Iizawa, 2003). We have conducted a survey about misconceptions using the Common-Sense Psychology Questionnaire (Tajimi et al., 2003) in the first Psychology and Introduction to Psychology classes. The main purpose of this questionnaire is to stimulate students' interest in the psychology course and to heighten their motivation to participate in the class. At the same time, the questionnaire can provide information about the psychological knowledge these pre-psychology course students have.

Thus far, we have investigated these pre-psychology course university students' knowledge of psychology, and have confirmed that many of them have misconceptions. We found that arts major students have a somewhat higher correct answer percentage than science major students (Tajima et al., 2003; Tajimi, Kijima, Yamashita, Nose, Okabe, and Ichihara, 2006; Tajimi, Yamashita, Kijima, and Iizawa, 2005). In the present study, we administered the Common-Sense Psychology Questionnaire (Tajimi et al., 2003) and compared the responses of first-year university students with those of correspondence course students. The correspondence course students were adults in the workforce, and many of them had taken psychology-related classes in the past. It is assumed that their level of knowledge from social and educational experiences differs from that of first-year university students. Thus, we evaluated first-year university students' knowledge of psychology through comparison with correspondence course students.

METHOD

Participants

The participants were 251 first-year university students (FY group) at the Faculty of Human Science, A University (86 males, 165 females, age range 18 to 20 years, mean age 18.2 years), and 32 correspondence course students (CC group) from the Faculty of Liberal Arts, B University (4 males, 28 females, age range 23 to 66 years, mean age 40.9 years). Most of the CC group were adults in the workforce, and had previously taken some psychology-related subjects.

Materials

Tajimi et al. (2003) constructed the Common-Sense Psychology Questionnaire in order to study misconceptions about psychology. This questionnaire consists of 40 items related to psychology (e.g., "children memorize much more easily than adults") in which the subjects are required to answer "true" or "false" (the correct answers are all "false"). The 40 items are made up of short statements created by McKeachie (1960) and Vaughan (1977), as well as new statements created by Tajimi et al. (2003). The questionnaire includes some statements that lack exactness and themes that are controversial. In this study, we excluded the 10 items that lack exactness in expression; thus, only 30 questionnaire items were used for analysis.

Procedure

For the FY group, the printed Common-Sense Psychology Questionnaires were handed out to all the students before the start of the first Introduction to Psychology class. The instructor read aloud one item at a time, and the students answered true or false. After all the items were answered, the instructor gave the correct answers and explained the statements. For the CC group, the Common-Sense Psychology Questionnaire was conducted at the beginning of the first Elementary Experiments of Psychology class in the same manner as with the FY group.

RESULTS

1. Comparison of the correct answer percentages between the FY group and the CC group

The number of correct answers for the 30 items was converted to a 100-point score (percentage) for each participant. In order to evaluate the accuracy of psychological knowledge among first-year university students, the mean correct answer percentages for the FY group were compared with those for the CC group (Table 1). The mean cor-

Table 1. Statistics of correct answer percentages for all items for the FY and CC groups.

| | FY group | CC group |
|-----------|----------|----------|
| N | 251 | 32 |
| Average % | 42.73 | 70.31 |
| SD | 8.58 | 15.08 |
| Minimal | 22.50 | 33.33 |
| Maximum | 67.50 | 93.33 |
| Range | 45.00 | 60.00 |

rect answer percentage for the FY group was less than 50%, which is the chance level for true/false questions. *t*-test (Welch's method) indicated that the correct answer percentage for the FY group was significantly lower than that for the CC group ($t(34)=10.138, p<0.001$).

2. Comparison of the incorrect answer percentages for the FY group and the CC group by item

Table 2 indicates the incorrect answer percentages for the FY group in the order of items with the most incorrect answers. Only the 10 highest items for the FY group are presented. The incorrect answer percentage of the CC group for the same item is shown in parallel. The field of psychology pertaining to each item is presented in parentheses at the end of the statement. The Chi-square test was conducted to reveal the differences in the incorrect answer percentage for each item between the two groups. Results indicated that the incorrect answer percentage for the FY

Table 2. Mean incorrect answer percentages by each item for the FY and CC groups. Only the 10 highest items for the FY group are presented.

| No. items (field) | % incorrect in FY | % incorrect in CC | χ^2 test sig. |
|--|-------------------|-------------------|--------------------|
| 06. Blind people have unusually sensitive organs of touch. (Sensation and perception) | 87.6% | 75.0% | <i>n.s.</i> |
| 33. Children memorize much more easily than adults. (Memory) | 86.9% | 62.5% | $p<0.001$ |
| 39. Children's IQ scores have very little relationship with how well they do in school. (Personality and intelligence) | 73.3% | 40.6% | $p<0.001$ |
| 04. Fortunately for babies, human beings have a strong maternal instinct. (Development) | 72.9% | 31.3% | $p<0.001$ |
| 26. Properly trained psychiatrists and psychologists can easily detect persons who act like psychotic patients by means of several interviews. (Clinical psychology) | 67.7% | 46.9% | $p<0.05$ |
| 23. After doing tedious and boring part-time work, those who received a high pay rate evaluated the work more highly than those who received a low pay rate (Social psychology) | 61.0% | 75.0% | <i>n.s.</i> |
| 24. Psychiatrists are defined as medical persons who use psychoanalysis. (Clinical psychology) | 60.6% | 15.6% | $p<0.001$ |
| 31. In order to go into practice as a clinical psychologist in Japan, one must pass the national examination held by the Ministry of Health, Labor and Welfare. (Clinical psychology) | 60.6% | 37.5% | $p<0.05$ |
| 15. The more highly motivated you are, the better you will do at solving a complex problem. (Motivation) | 59.0% | 59.4% | <i>n.s.</i> |
| 40. With the exception of hallucinations, dreams, or other pathological conditions, under a normal mental state, you cannot see things that are physically nonexistent. (Sensation and perception) | 50.6% | 46.9% | <i>n.s.</i> |

Table 3. Number of items with more than 50% incorrect answers in each psychological field.

| Field (total number of items) | FY group | CC group |
|--|----------|----------|
| General psychology (5 items) | 0 | 0 |
| Sensation and perception (3 items) | 2 | 1 |
| Memory (1 item) | 1 | 1 |
| Learning (2 items) | 0 | 0 |
| Motivation (1 item) | 1 | 1 |
| Educational psychology (1 item) | 0 | 0 |
| Personality and intelligence (3 items) | 1 | 0 |
| Development (3 items) | 1 | 0 |
| Social psychology (5 items) | 2 | 1 |
| Clinical psychology (4 items) | 3 | 0 |
| Parapsychology (2 items) | 0 | 0 |
| Total | 11 | 4 |

group for six of the ten items was significantly higher than that for the CC group.

There were 11 items with more than 50% incorrect answers for the FY group and four such items for the CC group. Analysis of this difference by field of psychology (Table 3) for the FY group indicated three items under "Clinical psychology" (four items in all), two under "Social psychology" (five in all), two under "Sensation and perception" (three in all), and one each under "Memory," "Motivation," "Personality and intelligence," and "Development." No salient bias was observed in the incorrect answer percentage for the CC group.

Next, we examined the relationship between the incorrect answer percentage for the FY group and that for the CC group. The Spearman's rank correlation coefficient was 0.787, and we found a significant positive correlation between the two groups ($p < 0.001$). While the correct answer percentage was lower for the FY group than for the CC group, the result suggests that the misconceptions are partially held by both groups.

DISCUSSION

1. First-year university students' knowledge of psychology

Even people who do not receive an education in psychology create their own psychological beliefs based on their personal experiences. These beliefs are called "common-sense psychology,"

"popular psychology," or "lay psychology." Their content is often mistaken, though some have strong convictions (Nose, Kijima, and Yamashita, 2009). Lilienfeld et al. (2010) refers to misconceptions about psychology as "psychological myths," and cites three causal factors for such myths: word-of-mouth, selective perception and memory, and misleading film and media portrayals. Ethics textbooks in Japanese senior high schools address matters related to psychology; however, Takahashi and Nihei (2010) pointed out undue inclinations toward psychoanalysis and little psychological knowledge with verifiable evidence in those textbooks. Many include statements that are "obviously mistaken," "far from modern psychological knowledge," or "misleading."

Therefore, it is important to understand the students' level of accurate knowledge and their misconceptions when giving lectures on psychology at universities. In this study, we examined the knowledge of psychology held by the first-year university students compared with that held by adult students in the workforce using the Common-Sense Psychology Questionnaire constructed by Tajimi et al. (2003).

Converting correct answers to a 100-point scale indicated that the average score of the FY group was 42.73%; thus, they answered correctly less than 50% of the 30 questions. In contrast, the CC group scored 70.31%. These results confirmed that the FY group had more misconceptions about psychology, and that sufficient consideration is required when lecturing on psychology.

Analysis of the incorrect answer percentages indicated a significant positive correlation between the two groups. In addition, eight of the top ten most incorrectly answered items and the bottom 10 items in each category overlapped for the two groups. Based on this finding, we speculated that adult students have the same type of misconceptions as first-year university students, even though the incorrect answer percentage for adult students is lower.

2. Misconceptions about the psychological field

Table 2 presents the 10 items that had the high-

est incorrect answer percentages for the FY group. Some items had a high incorrect answer percentage for both groups, and some had a high percentage in the FY group but less than 50% in CC group. Almost half of those items belonged to the field of "Clinical psychology."

The number of items with more than 50% incorrect answers according to field of psychology is presented in Table 3. There was only one item in each field among the CC group with more than 50% incorrect answer percentage; for the FY group, there was a maximum of three items (but zero items for the CC group) in the field of "Clinical psychology" (four items in all). For example, item 31 states, "In order to go into practice as a clinical psychologist in Japan, one must pass the national examination held by the Ministry of Health, Labour and Welfare." This item deals with basic knowledge of qualifications, but the incorrect answer percentage was high at 60.6% for the FY group (37.5% for the CC group). At present, there are no national-level qualifications for clinical psychologists. Item 24 states, "Psychiatrists are defined as medical persons who use psychoanalysis." The incorrect answer percentage was high at 60.6% for the FY group (15.6% for the CC group). Item 26 states, "Properly trained psychiatrists and psychologists can easily detect a person who acts like a psychotic patient by means of several interviews." The incorrect answer percentage for this item was also high at 67.7% for the FY group (46.9% for the CC group). These results are thought to be partly attributed to incorrect or misleading information reported by the media regarding clinical psychology. In recent years, the media has often addressed the subject of psychology, especially the field of clinical psychology, and many people have an interest in this field. Members of the CC group who had work experience or study experience in college (or university) might be able to think critically about information from the media and perhaps be able to reject incorrect statements. Unfortunately, at least among the FY group, accurate knowledge about clinical psychology is not widespread; therefore, they have incorrect views about this field.

3. Corrections of misconceptions through social experience and psychology learning experience

The CC group scored a higher average than the FY group. One factor contributing to this difference may be that the CC group had already taken some psychology-related classes. However, McKeachie (1960) and Fukuda (1988) studied corrections of university students' misconceptions before and after taking a psychology course, and found virtually no change in their misconceptions. Thus, it is likely that psychology learning experience is not the sole factor in the difference between the two groups. Of the 32 members in the CC group, 10 were university graduates and 11 were junior college graduates. Therefore, the high score obtained by the CC group is not due to the fact that they had taken psychology-related subjects, but that they accumulated experience as adult members of society after graduating from university or junior college. In addition, their high interest in psychology to the extent that they applied to learn in a university correspondence course might contribute to correction of their misconceptions.

4. Future issues

The Common-Sense Psychology Questionnaire by Tajimi et al. (2003) was created to stimulate students' interest in a psychology course and to heighten their motivation to participate in the class. Thus, some of the items lack exactness of expression, and may include themes that are presently controversial. In this study, we excluded 10 such items for data analysis. The remaining 30 items do not cover all fields of psychology, and the numbers of items contained in each field in not same. These problems also exist in other tests related to misconceptions in psychology (e.g., Test of Common Beliefs; Vaughan, 1977). These items should be reviewed and improved in the future.

In addition, in this study, the participants were asked to answer "true" or "false." However, as Fukuda (1997) indicated, with such a forced-choice method, unintended judgment cannot be avoided. To address this problem, Kijima, Nose, and Yamashita (2008) had first-year university students

answer in a "yes/no" format as to whether each one thought his or her answer was right or not. As a result, they reported that in the fields of "Clinical psychology," "Social Psychology," "Sensation and perception," and "Memory," in all items where there was more than a 50% incorrect answers, many participants felt confident that their wrong answer was "correct." As Tajimi et al. (2005) indicated, many first-year university students incorrectly answered items that contained "unscientific, plain expressions" and that were "easy-to-understand, commonly accepted" statements but were highly confident of their answers. Future research is necessary to determine if the same trend exists with adult students in the workforce.

Lastly, we analyzed the constituent members of the CC group. In this study, in order to study first-year university students' knowledge of psychology, a comparative study was implemented among CC and FY students. However, 21 of the 32 CC students had already graduated from either a university or junior college and had pursued further university education. The 11 students whose final educational background was senior high school had also accumulated work experience and had pursued further education at B university; thus, they were likely to be highly motivated in learning. Bearing these points in mind, the CC group members may have been somewhat biased as samples of adults in the general society because very few adults continue lifelong learning once they are out of school. As Lilienfeld et al. (2010) indicated, psychological myths are widely prevalent in society, and both university students and adults in society are susceptible to such misconceptions. In the future, it will be necessary to conduct research with less biased samples of adults in the general society.

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