

International Conference on Education and Educational Psychology (ICEEPSY 2011)

## Causal relationship between sexual reality and experiences: A two-wave panel study of Japanese high school students

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### Abstract

The purpose of this study was to examine causal relationships between adolescents' sexual experiences and sexual reality which was the estimation of first sexual intercourse average age and of sexual intercourse experience rate of their peers. A two-wave panel study of half-year interval was conducted with 892 Japanese high school students. Results showed that the effect of sexual experiences on reality was confirmed in both male and female participants. In contrast, the effect of sexual reality on experiences was consistently confirmed only in female participants.

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*Keywords:* a false consensus effect, rate estimation, peer pressure, social norms, gender differences;

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### 1. Introduction

Japanese adolescents increasingly engaged in sexual activities at a younger age in recent years. The national survey (The Japanese Association for Sex Education, 2007) revealed that 14.4% male high school students in 1993, 26.5% in 1999, and 26.6% in 2005 reported having had sexual intercourse. Similarly, 15.7% of female high school students in 1993, 23.7% in 1999, and 30.0% in 2005 reported having had intercourse. It is estimated that 10% of the 10th graders and 30% of 12th graders have had intercourse. Japanese adolescents' sexual behavior drastically changed in the last 20 to 30 years.

Do adolescents accurately estimate their peers' sexual involvement? It does not appear to be the case. Japanese high school students estimated their peers' average age for the first intercourse at a much younger age than what has occurred in reality (Kashibuchi et al., 2010). The high school students erroneously estimated that a higher percentage of their peers had already had intercourse. Adolescents overestimated their peers' "sexual reality." This

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biased sexual reality may contribute to adolescents' engagement in sexual activities at a young age. Adolescents may think, "Everyone is having sex" so they "do not want to be behind" and they "want to have sex soon." Adolescents may idealize sexual activities and feel frustrated for not having them. Such feelings may lead them to accept and pursue sexual activities at a young age. Adolescents' perception that more of their peers have had intercourse could influence their sexual experiences.

In turn, adolescents' perceptions of others' sexual behavior (i.e., sexual reality) may also be influenced by their sexual experiences. People often perceive their own behavior and judgment as normal and appropriate and they think that they are the norm (Ross, Greene, & House, 1977). This bias is called the "false consensus effect". If it is applicable to the adolescents' sexual reality, adolescents with sexual experiences would perceive themselves as the majority and being in the norm. Adolescents' own experience may cause them to overestimate the rate of their peers' sexual experiences. A mutual causal relationship appeared to exist between adolescents' perceived sexual reality and their own sexual experiences. Little research had been conducted on this possible causal relationship.

This study examined the causal relationship between adolescents' perceived sexual reality and their own sexual experiences using two-wave panel study. A panel study refers to a survey research in which a group of variables are repeatedly measured for a group of participants in order to estimate causal relationships between variables.

## **2. Method**

### *2.1. Participants*

A two-wave panel study (T1: December of 2009, T2: June and July of 2010) was conducted with 10th grade and 11th grade Japanese students. The Japanese school system starts in April and ends in March of the following year. The participants were in the latter half of 10th grade during the first survey (T1), and in the first half of 11th grade during the second survey (T2). Data obtained from 892 Japanese high school students (349 males and 543 females) who participated both times were analyzed. The average age of participants at T1 was 15.7.

### *2.2. Questionnaire content*

#### *2.2.1. Own sexual experiences*

The participants were asked to identify if they had gone out on dates, kissed, engaged in sexual interactions without intercourse (pettings), had protected intercourse (with a condom), and had unprotected intercourse (without a condom). They were asked to rate 0 (had no experience) or 1 (had experience) for each activity in the survey.

#### *2.2.2. Estimate of sexual experiences of peers (sexual reality)*

The participants were asked to estimate the age of first sexual intercourse (years old) and sexual experience rate (%) for their Japanese male and female peers.

#### *2.2.3. Demographic variables*

The participants were asked to identify their gender.

### *2.3. Procedure*

The survey was distributed in the classroom. The participants answered questions in the classroom at the same time. The participants sealed the envelopes themselves and submitted the envelopes in order to protect the participants' confidentiality.

## **3. Results**

### *3.1. Basic Statistics*

### 3.1.1. Own sexual experiences

A new variable of “had intercourse” was calculated as a sum of “had protected intercourse” and “had unprotected intercourse.” The participants who had either protected intercourse or unprotected intercourse was categorized as “had intercourse.” The participants who reported having neither was categorized as “have not had intercourse.”

Table 1 indicates male and female participants’ sexual experiences. At the time of the first survey (the latter half of 10th grade), 40% of the participants reportedly had gone on dates, 30% had kissed, 20% had engaged in sexual interactions without intercourse, and more than 10% had had intercourse. The results of the participants of this study were comparative to the results of 10th graders in the national survey for all sexual activities.

### 3.1.2. Sexual reality

Table 2 indicates the participants’ perceived sexual reality for their peers. At the time of the second survey, the actual rate of the participants who had had intercourse was 18.0% for male participants and 14.3% for female participants (see Table 1). On the other hand, the male participants estimated that 32.12% of their male peers had had intercourse and 39.99% of their female peers had had intercourse. The female participants estimated 34.56% of male peers and 37.10% of female peers had had intercourse. The participants overestimated the rate by 15 to 20 points higher than the actual rate of intercourse.

These results also indicated that the participants underestimated the age that their peers had intercourse for the first time. Less than 20% of 15 or 16 year-olds had reported having had intercourse in reality.

### 3.2. The effects of sexual experiences on sexual reality

In order to examine the false consensus effect (i.e., the participants’ own sexual experiences influencing perceived sexual reality), a Multiple Regression Analysis was conducted. In this analysis, the dependent variable was the perceived sexual reality (T2); the independent variables were the perceived sexual reality (T1) and adolescents’ own sexual experiences (T1). The data of male and female participants were analyzed separately.

Table 1. The rate of sexual experiences by gender (%).

	Male participants		Female participants	
	Time1	Time2	Time1	Time2
Date	42.2	49.5	41.3	50.3
Kiss	32.1	38.2	32.6	39.5
Without intercourse	23.3	29.7	21.2	28.0
Sexual intercourse	11.6	18.0	10.1	14.3
Protected	10.7	17.1	8.8	13.7
Unprotected	5.6	8.6	6.0	7.4

Table 2. The means and SDs of sexual reality by gender.

		Male participants		Female participants	
		Time1	Time2	Time1	Time2
First sexual intercourse average age (years old)	(Male peers)	17.85 ( 5.69)	17.83 ( 6.10)	16.87 ( 2.18)	16.73 ( 2.05)
	(Female peers)	16.98 ( 3.49)	17.30 ( 5.23)	16.93 ( 2.25)	16.82 ( 2.16)
Sexual intercourse experience rate (%)	(Male peers)	32.98 (22.56)	32.12 (21.66)	38.78 (20.60)	39.99 (21.65)
	(Female peers)	37.06 (24.88)	34.56 (23.36)	36.63 (20.19)	37.10 (20.68)

Table 3 indicates the significant Standardized Partial Regression Coefficients ( $\beta$ ). For the male participants, all types of sexual experiences had negative effects on their estimation of their male peers' age of the first intercourse ( $\beta_s = -.12 \sim -.17$ ). These results indicate that when the boys have sexual experiences, they estimate that their male peers are younger when they have had intercourse for the first time. The false consensus effect was supported for this case. However, male participants did not present with the false consensus effect in estimating their female peer's age of the first time they had intercourse. As for the estimated rate of intercourse, all sexual experiences except for "had unprotected intercourse" showed positive effects on their perceived rate of their male peers having had sexual experiences ( $\beta_s = .12 \sim .18$ ). All sexual experiences except for "had intercourse" and "had unprotected intercourse" showed positive effects on perceiving their female peers having had sexual experiences ( $\beta_s = .10 \sim .17$ ). These results imply that adolescent males who have sexual experiences overestimate their male and female peers' sexual experiences (i.e., false consensus effect).

For female participants, the false consensus effect was also demonstrated. Having gone on dates, having kissed, and having had sexual interactions without intercourse showed negative effects ( $\beta_s = -.08 \sim -.13$ ) on perceiving their male peers' age of the first intercourse. All sexual experiences other than "had gone on dates" showed negative effects ( $\beta_s = -.08 \sim -.13$ ) on perceiving their female peers' age of the first intercourse. As for the estimated rate of intercourse, all sexual experiences except for "had protected intercourse" had positive effects ( $\beta_s = .08 \sim .22$ ) on perceived rate of their male peers having had intercourse. All sexual experiences had positive effects ( $\beta_s = .08 \sim .20$ ) on perceived rate of their female peers having had intercourse. All of these results indicate that when girls have sexual experiences of their own, they underestimate the age of first intercourse for their peers and overestimate the rate of having had certain sexual experiences (i.e., false consensus effect).

### 3.3. The effects of sexual reality on sexual experiences

A Logistic Regression Analysis was conducted in order to examine the adolescents' sexual reality's effects on their own sexual experiences for male and female participants. The dependent variable was the participants' own sexual experiences (T2); the independent variable was the participants' perceived sexual reality (T1). In this analysis, the Odds ratio (OR) of 1 or more signifies a positive effect, and less than 1 signifies a negative effect. It is not logically possible for the sexual experiences (dependent variables) to be 1 (had experience) in the first survey (T1) and 0 (have not had experience) in the second survey (T2). Therefore, only the participants who answered 0 (have not had experience) in the first survey (T1) for each sexual experience were used for analysis.

Table 3. The effects of sexual experiences on sexual reality by gender.

	Male participants				Female participants			
	First sexual intercourse average age		Sexual intercourse experience rate		First sexual intercourse average age		Sexual intercourse experience rate	
	Male peers	Female peers	Male peers	Female peers	Male peers	Female peers	Male peers	Female peers
Date	-.15**	-	.12*	.14**	-.08*	-	.13***	.13***
Kiss	-.17**	-	.18***	.17***	-.13***	-.13***	.22***	.20***
Without intercourse	-.17**	-	.18***	.13***	-.09*	-.13**	.15***	.15***
Sexual intercourse	-.15**	-	.15**	-	-	-.09*	.08*	.11**
Protected	-.14*	-	.15**	.10*	-	-.09*	-	.08*
Unprotected	-.12*	-	-	-	-	-.08*	.08*	.13**

Note: Values shown in the table are standardized partial regression coefficients.

Values were listed in the table only when significant effects were observed. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Table 4. The effects of sexual reality on sexual experiences in female participants.

		Date	Kiss	Without intercourse	Sexual intercourse	protected	unprotected
First sexual intercourse	(Male peers)	-	-	-	-	-	-
average age	(Female peers)	-	-	.82*	-	-	-
Sexual intercourse	(Male peers)	1.02**	1.04***	1.03**	-	1.03**	-
experience rate	(Female peers)	1.03**	1.03***	1.03**	-	1.02*	-

Note: Values shown in the table are odds ratios.

Values were listed in the table only when significant effects were observed. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

The male participants did not show the significant Odds ratios for all perceived sexual reality but one. The male participants' rate estimation of their male peers having had intercourse showed a positive effect on "had unprotected intercourse" (OR=1.03). This result indicates that overestimating the percentage of their male peers who have had intercourse may have promoted them to actually have unprotected intercourse.

For the female participants, Table 4 indicates the significant Odds ratios. Estimated rate of their male and female peers having had intercourse had positive effects on all sexual experiences except for "had intercourse" and "had unprotected intercourse" (ORs=1.02~ 1.04). These results imply that overestimating their peers' sexual experiences would promote their own sexual experiences.

No significant effect was observed on the age of the first intercourse except for "had sexual interactions without intercourse." The female participants' perception of their female peers' age of the first time they had intercourse had a negative effect (OR=.82) on their own sexual interactions without intercourse. These results indicate that underestimating the female peers' age of first intercourse might have promoted their own engagement in sexual interactions without intercourse.

#### 4. Discussion

The results of this study supported the false consensus effect for adolescent male and female participants. When the adolescents have sexual experiences of their own, they perceive that engaging in sexual experiences have been the norm. They may have consequently estimated that their peers also have had sexual experiences. This tendency was more significant among the same-sex peers.

The adolescents' perceived sexual reality did not show consistent influence on their own sexual behavior, especially for males. For the female participants, the results consistently implied that the overestimation of their peers' sexual experiences had promoted their own sexual experiences. Though such results were not apparent for the male participants, it would be inaccurate to conclude that their perceived sexual reality had no influence on their actual sexual behavior. For boys, their female partners and opportunities largely influence actual engagement in sexual activities. It is a general consensus that females have more decision-making powers than males in terms of sexual activities. Boys may overestimate their peers having had sexual activities and feel wishful, frustrated, and motivated to have sexual activities. Boys, however, may not succeed in engaging in such sexual activities. Future research should examine if adolescents' perceived sexual reality, mediated by "wish" and "frustration" to have sex, influence their sexual behavior.

**Acknowledgments: This work was supported by Mitsubishi Research Institute, Inc., Safer Internet of JAPAN, Ministry of Internal Affairs and Communications, and KAKENHI (23700809).**

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