



Dissociation mediates the relationship between peer victimization and hallucinatory experiences among early adolescents



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ABSTRACT

Peer victimization increases the risk of experiencing psychotic symptoms among clinical and general populations, but the mechanism underlying this association remains unclear. Dissociation, which is related to peer victimization and hallucinatory experiences, has been demonstrated as a significant mediator in the relation between childhood victimization and hallucinatory experience among adult patients with psychosis. However, no studies have examined the mediating effect of dissociation in a general early adolescent population. We examined whether dissociation mediates the relationship between peer victimization and hallucinatory experiences among 10-year-old adolescents using a population-based cross-sectional survey of early adolescents and their main parent (Tokyo Early Adolescence Survey; $N = 4478$). We examined the mediating effect of dissociation, as well as external locus of control and depressive symptoms, on the relationship between peer victimization and hallucinatory experiences using path analysis. The model assuming mediation effects indicated good model fit (comparative fit index = .999; root mean square error of approximation = .015). The mediation effect between peer victimization and hallucination via dissociation (standardized indirect effect = .038, $p < .001$) was statistically significant, whereas the mediation effects of depressive symptoms (standardized indirect effect = $-.0066$, $p = 0.318$) and external locus of control (standardized indirect effect = .0024, $p = 0.321$) were not significant. These results suggest that dissociation is a mediator in the relation between peer victimization and hallucinatory experiences in early adolescence. For appropriate intervention strategies, assessing dissociation and peer victimization as they affect hallucinatory experiences is necessary.

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1. Introduction

Peer victimization in adolescence has long-term adverse effects on mental health (Takizawa et al., 2014; Lereya et al., 2015), including psychotic symptoms (Schreier et al., 2009). A recent meta-analysis demonstrated that adolescents who experienced peer victimization in childhood and adolescence had a twofold greater risk of experiencing psychotic symptoms as compared to those who did not (Van Dam et al., 2012). Further, the causal relationship between adolescent peer

victimization and psychotic symptoms has been suggested in a prospective cohort study (Kelleher et al., 2013). However, the mechanism explaining how peer victimization increases the risk for psychotic symptoms remains unclear.

Dissociation is defined as the “lack of normal integration of thoughts, feelings and experiences into the stream of consciousness and memory” (Bernstein et al., 1993). Dissociation can be caused by peer victimization in childhood and adolescence (van Ijzendoorn and Schuengel, 1996; Campbell and Morrison, 2007; Teicher et al., 2010) and lead to loosening reality discrimination (Allen et al., 1997), as well as psychotic symptoms, particularly hallucination (Anketell et al., 2010.; Escher et al., 2002a; Escher et al., 2002b; Pilton et al., 2015; Varese et al., 2011), because dissociation due to peer victimization undermines a person's grounding in the outer world and weakens their ability to reality test

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(Allen et al., 1997). Hallucination can be conceptualized as dissociated components of the self arising from the failure to integrate adverse and traumatic sensory and psychological experiences into the context of the self-identity (Longden et al., 2012), which develops during adolescence (Kasai, 2013; Sawyer et al., 2012).

A recent meta-analysis suggested that traumatic experience induced dissociative experiences (Dalenberg et al., 2012, 2014) and that dissociative experiences are particularly related to hallucinatory experiences, in both clinical and non-clinical samples (Pilton et al., 2015), even after controlling for depressive symptoms (Altman et al., 1997). Previous studies have suggested that the relationship between peer victimization and hallucinatory experiences could be accounted for by dissociation (Pilton et al., 2015; Longden et al., 2012; Varese et al., 2012; Perona-Garcelan et al., 2012; Perona-Garcelan S et al., 2014; Kisiel and Lyons, 2014). However, clinical studies have had small samples and assessed childhood victimization retrospectively when participants were approximately 40 years of age (Varese et al., 2012; Perona-Garcelan et al., 2012). A non-clinical study also showed the mediating effect of dissociation in young adulthood, although childhood victimization was recalled after 15 years and potential mediating factors were not controlled for (Perona-Garcelan et al., 2014).

Further, a study conducted on victimized adolescents demonstrated the mediating effect of dissociation on the relationship between victimization and overall mental health (Kisiel and Lyons, 2014), but this study was also limited by small sample size. Additionally, it did not focus specifically on peer victimization or hallucinatory experiences. A notable study attempted to examine the pathway between peer victimization and psychotic symptoms among early adolescents: Fisher et al. (2013) found that external locus of control, which can lead to misattributions of perceptual anomalies (Garety et al., 2007), and depressive symptoms had a significant mediation effect on the relationship between peer victimization and psychotic symptoms among 7000 adolescents aged 13 (Fisher et al., 2013). About 30% of the association between peer victimization and psychotic symptoms could be explained by the mediating effects of external locus of control and depressive symptoms. The unexplained portion of the association might represent other mediating factors. However, they did not examine the effect of dissociation on the relationship between peer victimization and hallucinatory experience.

Thus, to our knowledge, no previous research has examined whether dissociation mediates the relationship between peer victimization and hallucinatory experiences in early adolescence. We hypothesized that dissociation mediates the relationship between peer victimization and hallucinatory experiences. The aim of the present study was to test this hypothesis and further examine the mediation effect of dissociation while controlling for external locus of control and depressive symptoms among 10-year-old adolescents. We used path modeling, which allows us to infer a mediating relationship between peer victimization and hallucinatory experiences via dissociation while controlling for possible confounders.

2. Methods

2.1. Study design, sample, and survey procedures

This study used data from the Tokyo Early Adolescence Survey (T-EAS), which was originally designed as a baseline cross-sectional survey for the subsequent longitudinal cohort study (Tokyo Teen Cohort), which is currently ongoing (URL: <http://ttcp.umin.jp/index.html>). The T-EAS is a multidisciplinary survey of 10-year-old adolescents aimed at investigating their health and development. We randomly sampled early adolescents by using the resident register in three municipalities: Setagaya-ku, Mitaka-shi, and Chofu-shi in the metropolitan area of Tokyo. Eligible residents were those born between September 2002

and August 2004. The survey was carried out between October 2012 and January 2015. We sent letters of invitation to participants around their 10th birthday. Then, a trained interviewer visited their home. The survey was completed twice over two visits. At the first visit, written informed consent from the adolescent and his/her main parent (generally mothers) was obtained, and they were asked to complete the questionnaires at home by the second visit. At the second visit, the adolescent and his/her main parent were asked to answer the self-report questionnaires separately. The questionnaires were enclosed in envelopes by the respondents immediately after completion. Also during the second visit, the interviewer measured the adolescent's height and weight. Concurrently, the main parent responded to a semi-structured interview. All data were collected anonymously. T-EAS is based at three research institutes: Tokyo Metropolitan Institute of Medical Science, The University of Tokyo, and SOKENDAI (The Graduate University for Advanced Studies). This survey was approved by the ethics committees of the above three institutes.

2.2. Participants

Among 18,830 eligible pairs of adolescents and parents, 14,553 were randomly selected. Of these, 4319 could not be contacted. Out of the 10,234 children who were accessible, 5756 adolescents and/or their parents refused to participate. Therefore, 4478 pairs participated in the survey (response rate: 43.8%). Among the consenting pairs, 201 (4.5%) were excluded from the analyses due to incomplete responses to questions of interest. Hence, the remaining 4277 cases were analyzed (mean age = 9.8 years, *SD* = 0.4; 53% boys).

2.3. Measures

2.3.1. Hallucinatory experiences

Hallucinatory experiences were assessed by the main parent of the participant using 2 items derived from the Child Behavior Check List (Achenbach, 1991; Itani et al., 2001). The following factors were assessed: (i) auditory hallucination ("hears sounds or voices that aren't there") and (ii) visual hallucination ("sees things that aren't there"). Responses were provided on a 3-point scale: not true = 0, somewhat or sometimes true = 1, very true or often true = 2. The hallucinatory experiences score was defined as the sum of these 2-item scores (possible range: 0–4).

2.3.2. Dissociation

Dissociation was assessed by the main parent of the participant using 6 items from the Child Behavior Check List based on previous studies demonstrating acceptable internal consistency (Malinosky-Rummell and Hoier, 1991; Becker-Blease et al., 2004). We used the following questions: i) "acts too young for his/her age," ii) "can't concentrate, can't pay attention for long," iii) "confused or seems to be in a fog," iv) "daydreams or gets lost in his/her thoughts," v) "stares blankly," and vi) "sudden changes in mood or feeling." All responses were given on a 3-point scale: not true = 0, somewhat or sometimes true = 1, very true or often true = 2. The dissociation score was defined as the sum of these 6-item scores (possible range: 0–12).

2.3.3. Peer victimization

Participants' peer victimization in the previous 2 months was assessed by main parents using a global scale that adopted questions from the Olweus Bully/Victims Questionnaire (Solberg and Olweus, 2013). The definition of bullying was shown and participants were asked, "How often has your child been bullied at school in the past 2 months?" Responses were based on a 5-point Likert scale: it hasn't happened to my child in the past couple months = 0, only once or twice

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