Check for updates

RESEARCH ARTICLE

# REVISED The Correlation between Enjoying Fictional Narratives and Empathy in Japanese Hikikomori [version 2; peer review: 2 approved]

Francesco Panto [iD], Tamaki Saito, Nobuaki Morita, Yasukazu Ogai

Social Psychiatry and Mental Health, University of Tsukuba , Faculty of Medicine, Tsukuba, Japan, 3058577, Japan

## Abstract

**Background:** Hikikomori is a Japanese social withdrawal phenomenon which, in recent years, is spreading in western developed countries as well. Spending a lot of time secluded indoors, watching and playing with fictional narratives may be relatively common for Hikikomori people and may represent a protective factor for their psychological well-being.

**Method:** We evaluated the role of enjoying fictional narratives on empathy, relaxation, depression, and anxiety in people with Hikikomori experience, in relation to their daily consumption of fictional narratives and their emotional transportation toward fictional narratives. Hikikomori from one psychiatric clinic and three different support facilities were enrolled in this study. Multidimensional empathy scale, CES-D, STAI questionnaire, and relaxation inventory self-report scale were used as outcome measures.

**Results:** We found a significant correlation between empathy and emotional transportation toward fictional narratives and between relaxation during watching and reading fictional narratives and consumption frequency of fictional narratives. We failed, however, to find any significant correlation with depression and anxiety.

**Conclusions:** These findings suggest a possible correlation between fiction and empathy/relaxation response; however, any causal relationship is not proven, consequently we deem that further investigations with a larger sample size are required for a better understanding.

## Keywords
Hikikomori, Social withdrawal, Emotional transportation, Empathy, narrative therapy

This article is included in the University of Tsukuba gateway.

**Corresponding author:** Francesco Panto (asclepio89@hotmail.it)

**Author roles: Panto F**: Conceptualization, Data Curation, Investigation, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing; **Saito T**: Conceptualization, Funding Acquisition, Methodology, Project Administration, Supervision, Validation; **Morita N**: Funding Acquisition, Resources, Supervision, Validation, Visualization; **Ogai Y**: Data Curation, Formal Analysis, Resources, Software, Supervision, Visualization

## Introduction

Hikikomori could be defined as a socio-medical condition originally manifested in Japan during the end of the twentieth century. The core feature of Hikikomori is considered to be a withdrawal with various degrees from social life. Hikikomori people spend most of the day confined indoors. Avoidance of social situations and social relationships, and functional impairment of social interactions are usually present. According to the Japanese Ministry of Health, Labor and Welfare (Saito, 2010), Hikikomori is defined as "a situation where a person without psychosis is withdrawn into his/her home for more than six months and does not participate in society such as attending school and/or work". Lifetime prevalence of Hikikomori in Japan is said to be 1.2% (Koyama *et al.*, 2010). A Japanese cabinet report has estimated the actual number of Hikikomori in Japan as around 540,000 (Tajan *et al.*, 2017), yet this estimation varies a lot among experts. For the general public staying indoors continuously is classically considered as a necessary feature of being Hikikomori. However, according to Japanese experts (Saito, 1998), the Hikikomori condition refers to a withdrawal from social situations, activity, and relationships with others without necessarily being physically restrained indoors. In Japan a large number of Hikikomori are still considered as such even if they visit hospitals, psychiatric clinics, employment support facilities, or even when they have an employment (Otaya, 2015). Originally considered as a cultural-bound syndrome profoundly embedded with cultural peculiarities of Japanese society, nowadays Hikikomori is reported in different economically developed countries (Lee *et al.*, 2015).

Kato *et al.* (2011) found that among 124 mental health professionals from eight countries, Hikikomori-like phenomena were reported, furthermore differences among countries were not significant, suggesting that cultural etiology could not be the only cause behind the phenomenon (Kato *et al.*, 2011). Hikikomori case studies have been conducted from several countries outside Japan including, Spain, Oman, the United States, Canada, Italy, the United Kingdom, France, Taiwan, and South Korea (Lee *et al.*, 2015; Malagón-Amor *et al.*, 2014; Sakamoto *et al.*, 2005). In a study including 2,313 Japanese people, Hihara *et al.* (2021) found that in young adults prosocial behaviors positively predicted positive identity elements, on the contrary Hikikomori symptoms and suicidal ideation positively predicted negative identity elements. These findings were significant only for socioculturally relevant indicators. This could

suggest the role of sociocultural elements in Hikikomori phenomenon.

For the etiology of Hikikomori there are variegated and yet contradicting points of views from experts. Hikikomori is not classically considered a psychiatric diagnosis. Some cases of Hikikomori meet the criteria of existing disorders in the DSM V (or ICD- 10), yet a consistent subset of cases does not meet the criteria of any existing psychiatric disorders, motivating some researchers to propose Hikikomori as a cultural-bound syndrome (Teo & Gaw, 2010). For example, Imai *et al.* found that anxiety scores were significantly higher in Hikikomori patients. (Imai *et al.*, 2021). Among western sociologists there are researchers who suggest that Hikikomori do not have inherent psychopathology, consequently, it can represent a transient phenomenon caused only by social factors (Furlong, 2008). Even if we fail to ascribe the Hikikomori phenomenon to a precise and univocal DSM V or ICD-10 diagnosis, it is still undeniable that people suffering from Hikikomori battle with a variegated cluster of psychiatric symptoms that results in impairing their daily activities. According to research by Kondo (Kondo *et al.*, 2013) in about 148 Hikikomori patients out of a 337 total who presented to medical institutions to be treated, a medical diagnosis was made according to DSM-IV-TR criteria. Schizophrenia, anxiety disorder, mood disorder, adjustment disorder, personality disorder (including six with avoidant personality disorder, schizoid personality disorder, obsessive-compulsive personality disorder) were commonly found (Suwa & Suzuki, 2013). Even if the Hikikomori phenomenon is not a disease "per se", a prolonged social withdrawal could trigger psychiatric symptoms. Hikikomori is generally described as a non-psychotic phenomenon. Even if psychiatric comorbidities may exist. A small but significant proportion of Hikikomori patients don't meet the criteria for any current diagnostic category. Tan, Lee & Kato (2021) suggested that a standardized diagnostic measure such as the 25-item Hikikomori Questionnaire should be used to assess this condition. Saito (2009) described the Hikikomori personality as characterized by low self-esteem and a tendency to feel anxious and nervous in front of other people.

In regard to the correlation between Hikikomori and internet addiction, there is not univocal consensus, as many researchers seem to point to internet use and online communication as a predisposing factor leading to social withdrawal (Taylor, 2006). Internet addiction and Hikikomori could also function as a comorbidity of the other. According to one study conducted In South Korea, 56% of Hikikomori are at risk of internet addiction, using the internet as their only way of communicating with the world (Lee *et al.*, 2013). On the other hand, it has been suggested that internet usage, being the preferred communication and social tool used by Hikikomori, could be paradoxically beneficial for a Hikikomori's quality of life (Chan & Lo, 2014). It could be a potential way to interact with medical professionals or even represent a means to attend school. In this regard it is worth mentioning that in Japan a rising popular online school, called Nko (Nkoutougakkou) allows futoko (students with school refusal)

and Hikikomori individuals to attend school directly from their rooms, becoming a precious tool that links them to a real community. In Japan, fictional narrative (mostly in the form of Anime and Manga) consumption behavior is classically related to the term Otaku. The term Otaku refers to "people who are interested in a specific genre or object, and are extraordinarily knowledgeable about it, but are lacking in social common sense" (Kam, 2013). Generally speaking, in Japan, the word Otaku is used to speak about people who have a high consumption of anime or manga productions and related goods. The relationships between Hikikomori and Otaku is not quite clear yet. Some Japanese experts have suggested that Hikikomori individuals often refuse to be labeled as Otaku for the social stigma linked to the word (Saito, 2009) Nevertheless, Saito (2009) also states that young otaku(s) in Japan tend to be bullied at school due to the presence of a "school caste system" that judges otaku students incapable of meaningful communication with peers. So, in the end younger otaku(s) tend to become Hikikomori in their adult life, developing an inferiority complex toward others. For these reasons we can assume that a part of Hikikomori population enjoys fictional narratives in their daily life. Asking Hikikomori individuals if they habitually use fictional narratives in their daily life and assessing the psychological effects of this activity, with this study we want to make an attempt in understanding this relationship. If a beneficial relationship is established, in the future we could use a form of remote narrative therapy to help Hikikomori. This therapy would be based on an activity which they already enjoy on a daily basis. This new narrative therapy approach could represent a tool of intervention in a population reluctant to get in touch with mental health facilities.

the authors are thinking about a new form of intervention using an original game. Some worth to mention similar programs which showed efficacy are Play Therapy (sense of well-being and psychological capital), (Chan, 2019), and SPARX (a new computerized cognitive behavioral therapy intervention) which showed efficacy in reducing depressive symptoms in adolescents (Merry et al., 2012).

## Fictional narratives and their psychological effects

"Fictional narratives" is a term used to classify activities that comprise enjoying a production which does not include actual factual information, like watching movies or anime, reading novels, or playing video games. They are fictional because they are not based on real facts or stories (or at least not entirely). (Busselle & Bilandzic, 2008). Enjoying fictional narratives is something everybody has experienced at least once in their lifetime and it has been suggested to benefit the personal insight of individuals, giving opportunities for self- discovery and self-insight (Green & Brock, 2002; Oatley, 1999; Oatley, 2002; Pelowski & Akiba, 2011). The mechanism through which this is deemed to be possible has been postulated by Green & Brock in their transportation-imagery model or emotional transportation theory (Green & Brock, 2002; Green & Donahue, 2009), and is thought to be possible through emotional transportation. Emotional transportation is defined as being emotionally involved with fictional characters of a fictional story. The

spectator of a fictional narrative production, if certain personal and environmental preconditions are present, will fall into a state of emotional detachment and be transported in the world of the story (Van Laer et al., 2014). This process, described in the transportation theory, may be mediated, according to Van Lear, by the empathy the spectator grows toward the story characters and the vivid imagination of the plot occurring in the mind of the spectator (Coplan, 2004). The process implicated in the transportation imagery model by Green & Brock could lead to different effects on the psyche of the spectator. One could be the enhancing of empathy toward other people. It has been suggested that people who enjoy a large quantity of fictional narrative productions become more empathetic towards other people (Mar et al., 2006). One possible interpretation that has been raised is that, for the mind of the spectator, fiction functions as a simulation of human and social interactions, therefore narrative may function as an indirect learning experience (Argo et al., 2008). In contrast, some researchers suggest that a possible explanation for fiction positively associated with empathy is that more empathetic people tend to enjoy more fiction in the first place (Bal & Veltkamp, 2013). The debate whether fiction influences empathy or not is still ongoing, but Bal & Veltkamp (2013) with an experimental approach demonstrated an undeniable influence of fiction compared to non-fiction to the empathy of the individual, but only when low or high emotional transportation into the specific story enjoyed occurred (Busselle & Bilandzic, 2009). The mediating role of emotional transportation in influencing empathy skills may be the main candidate in predicting empathy (Busselle & Bilandzic, 2009; Gerrig, 1993). Aside from emotional influence, the narrative transportation model predicts that narratives can induce a cognitive persuasion on the spectator, which is strong and long-lasting (Coplan, 2004). In other words, fictional narratives may trigger a cognitive transformation experience (Green & Brock, 2000; Phillips & Mcquarrie, 2010). Further investigations on this field lead to the distinction between analytical and narrative persuasion (Petty & Cacioppo, 1986). Compared to analytical persuasion of factual stories, narrative persuasion is not overtly persuasive, is not inherently critical and does not involve scrutiny, characteristics that allow persuasion to be more effective and long-lasting (Appel & Richter, 2007; Locke, 1987; Slater, 2002). The narrative persuasion evoked by fictional narratives could be linked to the Social Learning theory of Bandura (Evans et al., 1970). In this case, observation and subsequent behavioral imitation stems not from people in actual society but from fictional narrative characters.

Fictional narratives could be used as a form of narrative therapy. In this study we chose to examine also the relationship with depression and anxiety because there are evidences that narrative therapy is correlated to an improvement in these dimensions. For instance, in a randomized trial measured the effects of Narrative therapy for depression and anxiety among children with imprisoned parents, the findings showed an improvement in depression and anxiety for the intervention group. (Jalali et al., 2019). Another study assessed the the effectiveness of group narrative therapy on depression, quality of life (QoL), and anxiety among people with amphetamine addiction showing

a statistically significant reduction in depression and anxiety scores (Foroushani & Foruzandeh, 2015). Other studies showed similar effects on depression and anxiety using narrative therapy. (Lopes *et al.*, 2014; Naziri *et al.*, 2010)

### Hikikomori and fictional narratives and study rationale

According to a fact-finding investigation about Hikikomori conducted by the Japanese Ministry of Health, Labour and Welfare, in 2010, concerning activities engaged in indoors, Hikikomori individuals engaged more in the reading of books, playing video-games and using internet compared to healthy individuals (Japanese Ministry of Health, Labour and Welfare, 2010). Yet, actually there is no data regarding Hikikomori engaging in fictional narratives in their daily lives more than healthy individuals. The rationale of this investigation is based on the hypothesis that Hikikomori individuals that engage more often in fictional narratives, or who are more easily emotionally transported to a story tend to be more empathetic at the same level of social impairment. We want also to verify if Hikikomori individuals, who engage in fictional narratives more often or have a higher level of emotional transportation, have accordingly lower levels of the anxiety and depression associated with their condition. According to previous researches, there are few but significant findings of the relationship between empathy and fictional narrative consumption. However, to the authors' knowledge, there are no studies that try to estimate if the consumption of fictional narratives may or may not enact as a protective factor against depression or anxiety in socially impaired individuals. If a beneficial correlation is established it could be worth trying to develop a method of intervention using fictional narratives (anime, games) to support Japanese socially impaired individuals.

## Methods
### Participants

In this study, we enrolled only Hikikomori who already got in touch with medical facilities (psychiatric clinics) or non-profit support facilities providing Hikikomori individuals - self-help groups or employment support. Being difficult to get in touch with them, we excluded actively secluded Hikikomori individuals. For this reason, Hikikomori enrolled in this study are considered "people who experienced Hikikomori phenomenon" and not people who were actively secluded. Inclusion criteria were (a) belonging to a support facility for Hikikomori or be treated for Hikikomori as an outpatient or a daycare patient in a psychiatric clinic or hospital. (b) being over 18 years old. (c) being Japanese and (d) having experienced Hikikomori condition for over six months in the past. Participants were excluded if they presented (a) other psychiatric symptoms aside from social seclusion and impairment (b) psychotic symptoms.

### Procedures

The study received ethical approval from the Bio-Ethical Committee of Tsukuba University (ethical approval number 1247). We conducted a cross- sectional questionnaire survey from January 2018 to December 2018 in four different facilities. Three of them were non- profit support organizations and one was a psychiatric clinic (in this case we recruited patients in the

daycare facility and in the outpatient care as well), all located in the Kanto area, Japan. The recruitment procedure consisted of a periodic explanation by the authors of the research purpose and research protocol to Hikikomori individuals attending the support facilities and psychiatric clinic. Hikikomori individuals interested in the questionnaire were instructed to contact the facility staff afterward. After an evaluation of the patient eligibility by the authors the questionnaires were distributed to participants. The participants could either answer the questionnaire directly right after the distribution or they could bring it home and give it back afterward to the facilities staff. After data collection, we provided a participation incentive (a 500yen prepaid card) to all participants who completed the questionnaire.

### Measures
#### Outcomes measures

**The Center for Epidemiologic Studies Depression Scale, Japanese version (CES-D).** The CES-D is considered one of the gold-standard measures for depression. It a brief self-report 20-item measure that asks participants to rate how often over the past week they experienced symptoms associated with depression (Lewinsohn *et al.*, 1997). Response options range from 0 to 3 for each item (0 = Rarely or None of the Time, 1=Some or Little of the Time, 2=Moderately or Much of the time, 3 = Most or Almost All The Time). Scores range from 0 to 60. The cutoff score for clinical depression is 16 or greater. We decided to use the CES-D to assess any difference in depressive symptoms between Hikikomori individuals with a high and low rate of fictional narrative consumption and with high and low scores in emotional transportation. For this study we defined high emotional transportation as higher scores on the Narrative Transportation Scale compared to lower score in the same scale (low narrative transportation).

**The State-Trait Anxiety Inventory (Spielberger, 1983).** The State-Trait Anxiety Inventory (STAI) is a scale used to measure trait anxiety. It is generally used in clinical settings from physicians and clinical psychologists to diagnose anxiety. In this study, we implemented the 20 items version. All items are rated on a four-point-scale (e.g., from "Almost Never" to "Almost Always"). Higher scores indicate greater anxiety. This scale is considered one of the most valid and reliable instruments to assess clinical anxiety (Suzuki & Kino, 2008).

We decided to measure trait anxiety (vs. state) because we supposed a possible relationship between a tendency to be immersed into narratives stories and fictional consumption and a lower anxiety trait. In other words, we expect that a habitual higher fictional consumption and transportation could predict a long-term lower anxiety trait.

**Multidimensional Empathy Scale.** Multidimensional Empathy Scale (MES)is a Japanese 24-item self-report measure of 5 dimensions of empathy, for distinctively assessing self/other- orientation of either cognitive or emotional components. The five dimensions are 1) Other-Oriented Emotional Reactivity, 2) Self-Oriented Emotional Reactivity, 3) Emotional

Susceptibility, 4) Perspective Taking, and 5) Fantasy. (the internal consistency indexes for every sub scale were.71 .60 .78 .69 .70). A series of validation studies were made by authors to test the validity of the tool and each of the five sub-scales demonstrated a predictable pattern of relationships with existing scales like Interpersonal reactivity Index IRI or Questionnaire Measure of Emotional empathy QMEE (Mehrabian & Epstein, 1972).

**Short-form self-report measure to assess relaxation effect (S-MARE), (Sakakibara et al., 2014).** S-MARE is a relatively new self-report tool to assess relaxation effect based on the Relaxation Inventory (Crist et al., 1989). The item consists of three sub scales (a) physiological tension (b) psychological relaxation (c) anxiety. For each sub scale the Cronbach's coefficient was .93, .94 and .85. S-Mare scores were significantly correlated with the Emotional Relaxation Scale (Tokuda, 2011) (r=.446) and with State Anxiety (r= -.531) (N=172). The validity tests suggested that S-MARE has reliability and validity when correlating with cardiac parasympathetic tone, which is the physiological reaction to a relaxation stimulus. This suggests that S-MARE is a valid measure when measuring relaxation effects. Normally the assessment of relaxation effect occurs after the exposure to a relaxation stimulus evoked by a relaxation technique. For this study, we ask the participants to recall the relaxation state they usually experience while they are enjoying fictional narratives and to answer accordingly. We used S-MARE in a modified manner, for this reason the scores for this instrument may be affected by recall bias.

### Predictor measures

**Narrative Transportation Scale (NTS- J).** Japanese version of the scale (Osanai & Kusumi, 2016). NTS-J consists of 12 items and is a seven-point scale (from 1=not fitting at all to 7=fitting perfectly). Transportation into narratives is considered a mechanism by which narratives can affect beliefs. The elements included in the transportation experience are imagery, affect, and attentional focus. The Narrative Transportation Scale (NTS-J) was developed firstly by Green & Brock (2000). A shorter version of the same scale was developed by Appel et al. (2015). According to Green and Brock transportation is associated with story-consistent beliefs, meaning that highly transported participants had beliefs more consistent with the story and showed a more positive evaluation of characters. Although causality is not established, the persuasion effects of narratives are broadly demonstrated, meaning that highly transported individuals changed their real-world beliefs in response to experiences in a fictional world (Osanai & Kusumi, 2016). Japanese confirmatory studies showed the reliability of the scale and the correlation in measuring imaginative involvement and literary response. (Bal et al., 2011) Osanai & Kusumi's scale required the narrative task "Kin no Wa" and "Chiyogami no Haru" to the respondents. For this study, we instructed the participants not to limit the response to a single fictional production but to answer accordingly to their habitual emotional response to fictional narratives.

This modified use of NTS-J is supported by literature that claims a difference in individuals based on their transportability into

narrative worlds (Gnambs et al., 2014). Transportation has been linked to individual differences in trait empathy and trait absorption (Green & Donahue, 2009). Some authors describe transportation as an immersive tendency positively related to the Big Five dimensions of openness, neuroticism, and extraversion (Weibel et al., 2010). This trait transportability may define individual differences in becoming transported into narrative stories (e.g., Busselle & Bilandzic, 2008; Mazzocco et al., 2010).

### Consumption of fictional narratives

In this study, we decided to set as a predictor measure "habitual consumption of fictional narratives". We asked if participants had or did not have habitual consumption of fictional narrative productions (movies, anime, manga, novels, drama, or games). We asked if they enjoy fictional narratives "habitually", "from time to time "and "nothing at all". For the data analysis, we decided to set two groups. One that comprised only participants with habitual consumption of fictional narratives, the other which included participants who enjoy fictional narratives from time to times and participants who don't enjoy fictional narratives completely.

### Descriptive measures

**Hikikomori status evaluation.** In order to make an evaluation about the participants' Hikikomori status we employed a few questions extracted from the "Hikikomori status evaluation chart" implemented by Japan's Ministry of Health, Labour and Welfare, currently used by Japanese psychiatrists (Saito, 2010). Specifically, we asked about the age of onset of Hikikomori phenomenon, the perceived reason linked to the Hikikomori behavior, the number of friends, the experience of being bullying or bullying perpetrating behavior, and the use of internet and TV in daily life. We used a consensus evaluation measure of Hikikomori issued by the Japanese Cabinet Office after the 2016 Survey of Acute Social Withdrawal (Tajan et al., 2017).

## Data analysis

To test the Hypothesis that Hikikomori participants with high fictional narrative consumption rates and Hikikomori participants with low fictional narrative consumption rates were associated with the statistically significantly different mean of scores in the outcomes variables, an independent samples t-test was performed. To test the hypothesis that higher narrative transportation skills or high fictional narrative consumption rates were positively correlated with higher empathy and relaxation, and negatively correlated with anxiety or depression we performed a Pearson correlation test. Afterward, for statistically significant results, multiple regression analysis was performed. The level of statistical significance was set at $p<.05$. All data analysis was performed using SPSS v. 25 (IBM SPSS Statistics, RRID:SCR_019096).

## Results

A total of 270 questionnaires were distributed, 84 responses were collected, 4 were excluded from the analysis due to extensive missing values. The remaining 80 were suitable for the

analysis. To deal with the remaining amount of missing values, an Expectation Maximization algorithm was used for missing data analysis. Overall, less than 5% of data were missing from the dataset(n=80). A non-significant Little's MCAR test, $\chi2(281) = 309.403$, p = .11, revealed that the data were missing completely at random. Missing data were imputed using Missing Values Analysis within SPSS 25. A flow chart of the data collection process is shown in Figure 1. The average age (years) of participants (n=80) was 36 (SD 8.6). The period in which they started Hikikomori behavior, the reason they started to actively recluse themselves, the presence or absence of bullying experience, and the number of friends are reported in Table 1. Regarding fictional narrative consumption behavior, the participants' tendencies are shown in Table 2. We also asked the main reason why they enjoy fictional narratives when they do and the positive emotions elicited by consumption behavior as well as if they experience a decrease in negative emotions during consumption behavior or not, Table 2. To test the hypothesis of a correlation between fiction-consumption-related behavior (emotional transportation and fiction consumption rate) and the dependent variables, a Pearson correlation analysis was conducted. There was a positive correlation between emotional transportation and empathy, r = .498, p = < .001, n = 80. Also, there was a positive correlation between fiction consumption rate and relaxation, r = .280, p = < .005, n = 80, Table 3. An independent-samples t-test was conducted to compare relaxation, empathy, depression, and anxiety levels in Hikikomori with habitual consumption of fictional narratives and Hikikomori without habitual consumption of fictional narratives. There was a significant difference in the scores for habitual consumption (M=53.0, SD=12.4) and non-habitual consumption (M=46.3, SD=8.7) only for relaxation, Table 4. When we compared the level of relaxation between Hikikomori with habitual consumption and no habitual consumption (from time to time group and nothing at all group) of 3 groups, there was a statistically significant difference between groups as determined by one-way ANOVA (F (2,77) = 3.534, p = .034), Table 5. A multiple regression was carried out to investigate whether emotional transportation and fiction consumption rate could significantly predict participants 'empathy. The results of the regression indicated that the model explained 23.2% of the variance and that the model was a significant predictor of empathy, F (2,77) = 12.94, p<.01. While emotional transportation contributed significantly to the model (B = .551, p=.000), fiction consumption rate did not (B = -1.41, p=.539), Table 6. For relaxation, the results of the regression indicated that the model explained 5.5% of the variance and that the model was a significant predictor of relaxation, F (2,77) = 3.30, p = 0.042. While fiction consumption rate contributed significantly to the model (B = 6.61, p=0.14), emotional transportation rate did not (B = -0.26, p=.84), Table 6.

## Discussion

This study wanted to explore the connection between empathy relaxation, depression, anxiety, and fictional narrative consumption behavior by Hikikomori Individuals in Japan in order to introduce a new form of narrative therapy for Hikikomori individuals. Due to the lack of data regarding firstly, the influence of habitual consumption of fictional narratives on empathy relaxation, depression anxiety in the general population, moreover in Hikikomori individuals, the outcome setting was mainly exploratory. According to the results pertinent to the outcomes, t-test results have shown a statistically significant difference only for relaxation response in regard to fictional narrative consumption behavior. This could suggest that while consuming fictional narratives, Hikikomori individuals with habitual fictional narratives consumption behavior tend to have a higher relaxation response. For the correlation analysis and the multiple regression analysis conducted using transportation as a continuous variable predicting empathy, we obtained a pattern of results consistent with previous research that showed a
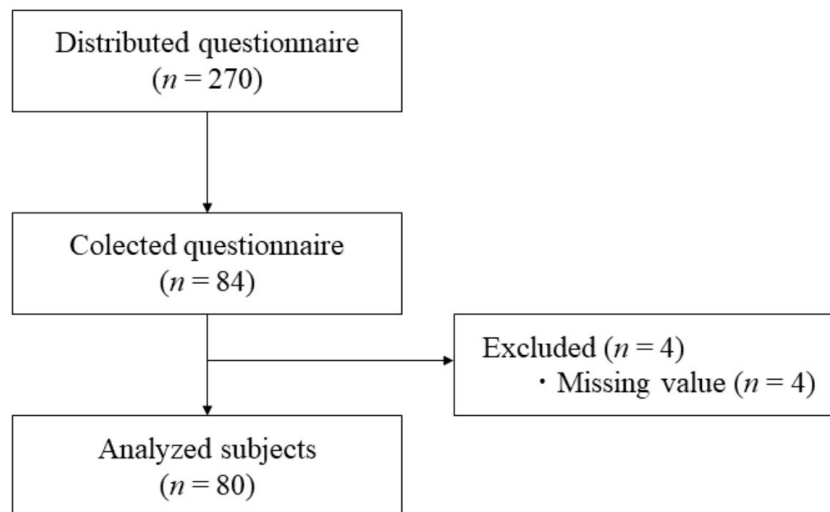


**Figure 1. Flow chart of data collecting process.**

**Table 1. Descriptive statistics of participants.**

|  | Total sample | % |
|---|---|---|
| Sex |  |  |
| Male | 60 | 75 |
| Female | 20 | 25 |
| Age (Years) |  |  |
| 18–30 | 22 | 27.5 |
| 31–39 | 31 | 38.8 |
| 40–49 | 21 | 26.2 |
| 50 or over | 6 | 7.5 |
| Starting period of Hikikomori behavior |  |  |
| From elementary to senior high school | 41 | 53.2 |
| From university to employment | 36 | 44.2 |
| Reason of Hikikomori behavior |  |  |
| Failure experience at school | 9 | 11.3 |
| Failure experience at work | 6 | 7.5 |
| Change in school environment | 10 | 12.5 |
| Change in work environment | 5 | 6.3 |
| Friction in family relationships | 23 | 28.7 |
| Friction in other relationship | 9 | 11.3 |
| Other | 16 | 12.6 |
| Experience of bullying or being bulled |  |  |
| Experience of being bulled | 48 | 62.7 |
| Experience of bullying | 25 | 32.6 |
| Number of friends |  |  |
| No one | 17 | 21.8 |
| At least one friend | 6 | 7.7 |
| At least two friends | 55 | 70.5 |

correlation between emotional transportation and empathy. However, considering the positive correlation between depression and trait anxiety, the results of the regression analyses may be affected by multi-collinearity.

Although correlation doesn't mean causality, in previous research measuring the effects of emotional transportation on fiction and nonfiction readers, it was shown that empathy was influenced only for fiction readers and not for nonfiction, suggesting the validity of emotional transportation theory (Busselle & Bilandzic, 2009). According to the transportation theory and its further developments, in order to change as a consequence of enjoying fictional narratives, the individual has to be emotionally transported, otherwise distraction from the story and consequently, disengagement from the story will occur (Goldstein, 2009; Mar *et al.*, 2009). Goldstein explains further the relationship existing between fiction and empathy. Compared to factual information, fiction is mainly oriented at eliciting emotions. For the spectators, while they are engaging in the characters emotions, the realistic aspect of the story loses its importance and does not act as a hindrance to experiencing characters emotions. On the contrary fictionality of the story could constitute a safe arena for the spectator, protecting from defense mechanisms while allowing the spectator to experience both his and the characters emotions (Eisenberg & Miller, 1987; Goldstein, 2009; Grant, 2008; Grant & Berry, 2011;

**Table 2. Narrative consumption tendencies in participants.**

| | Total sample | % |
|---|---|---|
| Fiction consumption | | |
| Habitual consumption | 46 | 57.5 |
| Occasional consumption | 25 | 21.3 |
| Absence of consumption | 9 | 11.3 |
| Reasons for fiction consumption behavior | | |
| Killing time | | 9.8 |
| Enjoying the contents | | 7.0 |
| Emotional transportation | | 15.4 |
| Feeling the mood supported | | 15.4 |
| Escapism from reality | | 12.9 |
| Feeling uplifted | | 12.9 |
| Refreshing | | 7.8 |
| Other (loving for the character, to learn about life, to foster creativity, custom) | | 18.8 |
| Positive emotions elicited by fiction narrative | | |
| Not affected | | 24.4 |
| Feeling more amused | | 9.4 |
| Feeling more motivated | | 24.8 |
| Feeling more hopeful | | 22.6 |
| Feeling more encouraged | | 18.8 |
| Negative emotions affected by fiction narrative | | |
| I forget almost entirely my negative mood | 9 | 11.3 |
| I don't forget my negative mood but I feel better | 59 | 73.8 |
| I retain entirely my negative | 11 | 13.8 |

**Table 3. Correlation between outcome variables and predictor variables.**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. Emotional transportation | - | .297** | .062 | .498** | 0.37 | -.074 |
| 2. Fiction consumption | .297** | - | .280* | 0.90 | -.082 | -.214 |
| 3. Relaxation | .062 | .280* | - | .097 | -.598** | -.510** |
| 4. Empathy | .498** | .090 | .097 | - | .168 | .183 |
| 5. Depression | 0.37 | -.082 | -.598** | .168 | - | .786** |
| 6. Anxiety | -.074 | -.214 | -.510** | .183 | .786** | - |

*$p< .05$. **$p< .01$

Stocks *et al.*, 2008). Finding a way to enhance empathy toward others could be meaningful from a psychological and social point of view especially for socially impaired individuals like Hikikomori. By promoting social behavior, empathy is considered to be a pro-social factor. Empathy is also considered to be related to individual creativity and cooperative behavior

**Table 4. T-test results comparing habitual and non-habitual consumption of fictional narratives on outcomes.**

| | Habitual consumption | | Non-habitual consumption | | |
|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *t* test |
| Empathy | 83.0 | 11.0 | 81.0 | 11.1 | -.79 |
| Relaxation | 53.0 | 12.4 | 46.3 | 8.7 | -2.6* |
| Depression | 49.5 | 9.4 | 51.2 | 11.4 | -.72 |
| Anxiety | 58.4 | 7.9 | 62.1 | 9.0 | 1.9 |

*$p < .05$. **$p < .01$

**Table 5. one way ANOVA for relaxation between fictional narrative consumption of 3 groups.**

| | Sum df of squares | Mean square | F | Sig. |
|---|---|---|---|---|
| Between groups | 869.887 | 434 | 3.53 | .034 |
| Within groups | 9476.398 | 123 | | |
| Total | 10346.285 | | | |

**Table 6. Multiple regression for emotional consumption and fictional consumption predicting empathy and relaxation.**

| | Predictors | (B) | *SE*(B) | β | Sig.(*p*) | *t* |
|---|---|---|---|---|---|---|
| empathy | Emotional Transportation | .551 | .110 | .517 | .000 | 5.0 |
| | Fictional consumption | -1.41 | .2.29 | -.064 | .539 | -.61 |
| relaxation | Emotional transportation | -0.26 | .127 | -0.23 | .840 | -.20 |
| | Fictional consumption | 6.61 | 2.63 | .287 | .014 | 2.5 |

*Note*. Empathy $R^2 = .232$. Relaxation $R^2 = .05$

in the workplace (Dumtrache, 2014; Stocks *et al.*, 2008). If it is true that empathy fosters social behavior, the other way around is also possible, that social contact is essential to maintain empathy skills. According to the social support theory (O'Reilly, 1988), social networks providing emotional concern (love, empathy, liking), instrumental aid, information, and appraisal, are regarded as a basic requirement for existence (Langford *et al.*, 1997). Hikikomori lacking healthy contacts with social networks could exist in a situation in which empathy skills are not promoted or maintained by exchanges with other individuals. In this light, if in future studies causality will be proven, the

enhancing of empathy related to consumption of fictional narratives could be meaningful in helping them not to weaken interpersonal skills during social isolation. Aside from empathy, T-test, Pearson correlation and Multi-regression analysis confirmed a relation between the habitual consumption of fictional narratives and relaxation effect. The relaxation effect measured in this study was linked to the physiological and psychological relaxation experienced during consumption of fictional narratives, as we instructed the participants to refer to their state during fictional narrative experiences. According to previous studies, the relaxation effect is correlated with emotional relaxation, physiological tension, and state anxiety. Hikikomori individuals who habitually enjoy fictional narratives or have higher emotional transportation skills tend to be more relaxed while watching a movie or reading a book. Even if the causality of this relationship is not proven and no correlation between predictor variables and anxiety and depression was found in this study, we can surely give some possible interpretations of the relaxation effect. It could be that people with high emotional transportation or fictional narrative consumption habits, have less risk of becoming detached, are more able to immerse themselves in the story and this could act as a protective factor against physiological and emotional tension. For Hikikomori individuals this could be particularly meaningful, given that the comorbidity with anxiety is very common. In this regard, we assessed anxiety with STAI in our study, and we found a mean score for anxiety that was relatively high and above the clinical threshold. The effect of fictional narratives on anxiety symptoms and emotional tension, even if the literature is quite limited, is not an unheard-of topic. In 2014 a study tested the effects of cinema therapy on diminishing anxiety in young people. Compared to a control group, participants who took cinema therapy sessions showed a lower score on the Hamilton anxiety rating scale. This suggests that Cinema Therapy could have a role in decreasing anxiety in individuals with high levels of stress and anxiety (Dumtrache, 2014). Furthermore, another study examined the effects of watching a movie on a family member's anxiety level during their relatives' surgery, assessing anxiety with STAI. It was found that after watching a movie the level of anxiety was significantly reduced in people already in an anxious state due to their relative's surgery (Mojdeh *et al.*, 2013). This suggested a possible protective role of fictional narratives towards anxiety and emotional tension (Fatahi *et al.*, 2021). Johnson (2012) conducted a study demonstrating that engaging in a fictional story fosters not only empathy but also prosocial behavior. Dunbar *et al.* (2016) proved that emotional arousal when watching drama increases pain thresholds and social bonding. These prosocial behavioral effects could be extremely useful for socially impaired Hikikomori(s). According to squared correlations, emotional transportation shared 25.0 % while fiction consumption rate and relaxation shared 9.0 %of the variance. Other possible responsible factors may be investigated in the future. In particular a study evaluating effectiveness of play therapy (online -game program) showed improving in empowerment and psychological capital (Chan, 2019). Play therapy could be considered a form of fictional narrative, so it could be worth to investigate in the

future stress coping related measures. However, another possible explanation for socially impaired people enjoying fiction narratives, could be that people with more depression and anxiety symptoms will interpret various events negatively and ruminate them repeatedly. In other words, lower depression and anxiety or higher relaxation predicting a tendency in enjoying Fictional Narratives is a possible convincing hypothesis. Also, Nonaka & Sakai (2021) found that stress coping skills, self-compassion, and psychological stress were associated with Hikikomori. The use of instruments which support these dimensions were associated with a decrease in Hikikomori related behaviors (Nonaka & Sakai, 2021). Hamasaki *et al.* (2021) evaluated environmental factors in adolescent Hikikomoris. "anxious/depressed," "somatic complaints," "lack of communication between parents" and "overuse of the Internet" were significant predictors of hikikomori severity. Even if the overuse of internet is considered a predictor of severity, no data exist regarding fiction Narrative consumption. In the future the authors are planning to explore the efficacy of an internet based narrative program to understand further the possible positive and supportive role of internet in the life of Hikikomori patients. Targeting with a computerized interactive program self-compassion, and other psychological stress dimensions could be useful as a tool of support for these patients.

However is worth to mention that Saito (2020) points out how Hikikomori in their middle age tend to hide their interest in entertainment because of a sense of guilt regarding recreational activities. Finally, with regard to depression and anxiety, no statistically significant result was observed, however a negative correlation between Anxiety, Depression, and Relaxation was observed. With this study, with its relatively small sample size, low coefficients results, and a cross-sectional nature, we couldn't draw any conclusive evidence about the psychological effects of fictional narrative consumption behavior, but the data suggest a possible correlation of fictional narrative consumption behavior with relaxation and empathy.

## Study limitations
This study incorporated several limitations mainly related to the peculiarity of the target group. Firstly, recruiting Hikikomori individuals was quite a challenging task, for this reason, we had to deal with a limited sample size to test the study hypothesis. Due to the exploratory nature of the study and the lack of scientific data related to Hikikomori fictional narrative consumption behavior, the selection of questionnaire items was not sufficiently endorsed by literature. Finally, maybe due to the difficulty in answering about psychiatric symptoms like depression and anxiety, we resulted in having participants reluctant in answering the questions which curtail the sample size even further. To overcome these limitations, a research design which includes internet survey may be the ideal solution, reaching directly to secluded Hikikomori individuals and lowering the risk of failed responses to questionnaire items.

## Conclusions
This study aimed to explore the situation of empathy, relaxation, anxiety, and depression of Hikikomori individuals related to their consumption of fictional narrative productions and their emotional transportation skills. Although the relationship with anxiety and depression could not be assessed due to the limited sample size, the results obtained for empathy and relaxation are consistent with the previous research done with healthy individuals. This may suggest the possible benefits of fictional narratives on enhancing empathy and diminishing emotional tension in Hikikomori individuals. Compared to healthy people, these results could be even more meaningful for Hikikomori individuals, given that they are subject to a higher level of anxiety and impaired social behavior compared to the general population. Considering the limitations of the study and the fact that only a correlation has been proven, the results should be interpreted with caution. To test the hypothesis for emotional transportation or fictional narrative consumption behavior to be predictors of empathy, relaxation, or other psychological dimensions, future research with an interventional study design is needed for a better understanding of causality before trying to establish a new experimental approach using narrative therapy for Hikikomori individuals. The usage of narrative therapy in adolescents seeking help in Japan is not an unheard topic. Iejima (2006) showed that Narrative therapy using manga liked by the clients (Japanese adolescents ) could be useful in improving self-awareness. Wada *et al.* (2017) described Manga digital storytelling as a potential learning tool. In the future, the authors want to build a digital program which uses characters and story in a narrative approach. This could be a very accessible tool for Hikikomori to get in touch with medical facilities in a casual an easy way.

## Data availability
Repository: Uploaded to Harvard Dataverse

Panto, Francesco, 2021, "The Correlation between Enjoying Fictional Narratives and Empathy in Japanese Hikikomori", https://doi.org/10.7910/DVN/8AYPKV, Harvard Dataverse, V1, UNF:6:cvasikAbeDexFrSerq36EA== [fileUNF]

this project contains the following underlying data:
• Data file 1. (Test score results in empathy, relaxation depression, anxiety, narrative fiction consumption and other descriptive measures in 80 Hikikomori patients.)

Data are available under the terms of Harvard Dataverse "No rights reserved"

## Participant consent
Written informed consent for publication of the participants details was obtained from the participants/parents/guardian/relative of the participant.

## References

Appel M, Gnambs T, Richter T, *et al.*: **The Transportation Scale-Short Form (TS-SF).** *Media Psychol.* 2015; **18**(2): 243–266.
**Publisher Full Text**

Appel M, Richter T: **Persuasive effects of fictional narratives increase over time.** *Media Psychol.* 2007; **10**(1): 113–134.
**Reference Source**

Argo JJ, Zhu R, Dahl DW: **Fact or fiction: An investigation of empathy differences in response to emotional melodramatic entertainment.** *J Consum Res.* 2008; **34**(5): 614–623.
**Publisher Full Text**

Bal PM, Butterman OS, Bakker AB: **The influence of fictional narrative experience on work outcomes: A conceptual analysis and research model.** *Rev Gen Psychol.* 2011; **15**(4): 361–370.
**Publisher Full Text**

Bal PM, Veltkamp M: **How does fiction reading influence empathy? An experimental investigation on the role of emotional transportation.** *PLoS One.* 2013; **8**(1): e55341.
**PubMed Abstract** | **Publisher Full Text** | **Free Full Text**

Busselle R, Bilandzic H: **Fictionality and perceived realism in experiencing stories: A model of narrative comprehension and engagement.** *Commun Theor.* 2008; **18**(2): 255–280.
**Publisher Full Text**

Busselle R, Bilandzic H: **Measuring narrative engagement.** *Media Psychol.* 2009; **12**(4): 321–347.
**Publisher Full Text**

Chan GH: **Application and effectiveness of play therapy using an online-game intervention for hidden youth.** *Br J Soc Work.* 2019; **50**(7): 2116–2134.
**Publisher Full Text**

Chan HY, Lo TW: **Quality of life of the hidden youth in Hong Kong.** *Appl Res Qual Life.* 2014; **9**(4): 951–969.
**Publisher Full Text**

Coplan A: **Empathic engagement with narrative fictions.** *J Aesthet Art Critic.* 2004; **62**(2): 141–152.
**Publisher Full Text**

Crist DA, Rickard HC, Prentice-Dunn S, *et al.*: **The relaxation inventory: Self-report scales of relaxation training effects.** *J Pers Assess.* 1989; **53**(4): 716–726.
**PubMed Abstract** | **Publisher Full Text**

Dumtrache SD: **The effects of a cinema-therapy group on diminishing anxiety in young people.** *Procd Soc Behv.* 2014; **127**: 717–721.
**Publisher Full Text**

Dunbar RI, Teasdale B, Thompson J, *et al.*: **Emotional arousal when watching drama increases pain threshold and social bonding.** *R Soc Open Sci.* 2016; **3**(9): 160288.
**PubMed Abstract** | **Publisher Full Text** | **Free Full Text**

Eisenberg N, Miller PA: **The relation of empathy to prosocial and related behaviors.** *Psychol Bull.* 1987; **101**(1): 91–119.
**PubMed Abstract** | **Publisher Full Text**

Evans RI, Rozelle RM, Lasater TM, *et al.*: **Fear arousal, persuasion, and actual versus implied behavioral change: New perspective utilizing a real-life dental hygiene program.** *J Pers Soc Psychol.* 1970; **16**(2): 220–227.
**PubMed Abstract** | **Publisher Full Text**

Fatahi N, Bardideh M, Talebi Bahman Biglou R, *et al.*: **The effectiveness of narrative therapy on reducing behavior problems and improving self-perception in students.** *Quarterly Journal of Child Mental Health.* 2021; **7**(4): 297–312.
**Publisher Full Text**

Foroushani EZ, Foruzandeh E: **Effectiveness of narrative therapy on mental health of addicts' wives treated in the addiction treatment centers in Khomeini Shahr.** *International Journal of Educational and Psychological Researches.* 2015; **1**(4): 266–271.
**Publisher Full Text**

Furlong A: **The Japanese Hikikomori phenomenon: Acute social withdrawal among young people.** *Sociol Rev.* 2008; **56**(2): 309–325.
**Publisher Full Text**

Gerrig RJ: **Experiencing narrative worlds: On the psychological activities of reading.** New Haven, CT: Yale, 1993.
**Reference Source**

Gnambs T, Appel M, Schreiner C, *et al.*: **Experiencing narrative worlds: A latent state-trait analysis.** *Personality and Individual Differences.* 2014; **69**: 187–192.
**Publisher Full Text**

Goldstein TR: **The pleasure of unadulterated sadness: Experiencing sorrow in fiction, nonfiction, and "in person."** *Psychol Aesthet Crea.* 2009; **3**(4): 232–237.
**Publisher Full Text**

Grant AM: **Does intrinsic motivation fuel the prosocial fire? Motivational synergy in predicting persistence, performance, and productivity.** *J Appl*

*Psychol.* 2008; **93**(1): 48–58.
**PubMed Abstract** | **Publisher Full Text**

Grant AM, Berry JW: **The necessity of others is the mother of invention: Intrinsic and prosocial motivations, perspective taking, and creativity.** *Acad Manage J.* 2011; **54**(1): 73–96.
**Publisher Full Text**

Green MC, Brock TC: **The role of transportation in the persuasiveness of public narratives.** *J Pers Soc Psychol.* 2000; **79**(5): 701–721.
**PubMed Abstract** | **Publisher Full Text**

Green MC, Brock TC: **In the mind's eye: Transportation- imagery model of narrative persuasion.** In M. C. Green, J. J. Strange, & T. C. Brock (Eds.), *Narrative impact: Social and cognitive foundations.* Mahwah, NJ: Lawrence Erlbaum Associates Publishers. 2002; 315–341.
**Reference Source**

Green MC, Donahue JK: **Simulated worlds: Transportation into narratives.** In K. D. Markman, W. M. P. Klein, & J. A. Suhr (Eds.), *Handbook of Imagination and Mental Simulation.* Hove: Psychology Press. 2009; 241–256.
**Publisher Full Text**

Hamasaki Y, Pionnié-Dax N, Dorard G, *et al.*: **Identifying social withdrawal (Hikikomori) factors in adolescents: Understanding the Hikikomori spectrum.** *Child Psychiatry Hum Dev.* 2021; **52**(5): 808–817.
**PubMed Abstract** | **Publisher Full Text** | **Free Full Text**

Hihara S, Sugimura K, Umemura T, *et al.*: **Positive and negative valences of identities: Longitudinal associations of identity content valences with adaptive and maladaptive functioning among Japanese young adults.** *Dev Psychopathol.* 2021; 1–15.
**PubMed Abstract** | **Publisher Full Text**

Iejima A, naratibu kara miru manga no eikyō to jiko keisei, nihonshinrigakkai taikai happyō ronbun-shū: **70-kan, nihonshinrigakkai dai 70 kaitaikai, sesshonID 2PM001.** 2006; 2PM001.
**Publisher Full Text**

Imai H, Takamatsu T, Mitsuya H, *et al.*: **The characteristics of patients with severe social withdrawal 'Hikikomori' in two community psychiatry clinics in Japan.** *Asian J Psychiatr.* 2021; **65**: 102833.
**PubMed Abstract** | **Publisher Full Text**

Jalali F, Hashemi SF, Hasani A: **Narrative therapy for depression and anxiety among children with imprisoned parents: A randomised pilot efficacy trial.** *J Child Adolesc Ment Health.* 2019; **31**(3): 189–200.
**PubMed Abstract** | **Publisher Full Text**

Japanese Ministry of Health Labour and Welfare: **Survey about awareness of young people: fact finding investigation about Hikikomori.** 2010; (last day of access: 31/7/2020) (In Japanese, translated by the author of this article.).
**Reference Source**

Johnson DR: **Transportation into a story increases empathy, prosocial behavior, and perceptual bias toward fearful expressions.** *Pers Indiv Differ.* 2012; **52**(2): 150–155.
**Publisher Full Text**

Kam TH: **The common sense that makes the 'otaku': Rules for consuming popular culture in contemporary Japan.** *Jpn Forum.* 2013; **25**(2): 151–173.
**Publisher Full Text**

Kato TA, Tateno M, Shinfuku N, *et al.*: **Does the 'hikikomori' syndrome of social withdrawal exist outside Japan? A preliminary international investigation.** *Soc Psychiatry Psychiatr Epidemiol.* 2011; **47**(7): 1061–1075.
**PubMed Abstract** | **Publisher Full Text** | **Free Full Text**

Kondo N, Sakai M, Kuroda Y, *et al.*: **General condition of *hikikomori* (prolonged social withdrawal) in Japan: Psychiatric diagnosis and outcome in mental health welfare centres.** *Int J Soc Psychiatry.* 2013; **59**(1): 79–86.
**PubMed Abstract** | **Publisher Full Text**

Koyama A, Miyake Y, Kawakami N, *et al.*: **Lifetime prevalence, psychiatric comorbidity and demographic correlates of "hikikomori" in a community population in Japan.** *Psychiatry Res.* 2010; **176**(1): 69–74.
**PubMed Abstract** | **Publisher Full Text**

Langford CPH, Bowsher J, Maloney JP, *et al.*: **Social support: a conceptual analysis.** *J Adv Nurs.* 1997; **25**(1): 95–100.
**PubMed Abstract** | **Publisher Full Text**

Lee YS, Lee JY, Choi TY, *et al.*: **Home visitation program for detecting, evaluating and treating socially withdrawn youth in Korea.** *Psychiatry Clin Neurosci.* 2013; **67**(4): 193–202.
**PubMed Abstract** | **Publisher Full Text**

Lee YJ, Seo MJ, Choi TY: **Psychopathological Characteristics of Social Withdrawal (Hikikomori) in the Korean Adolescent.** *J Korean Neuropsychiatr Assoc.* 2015; **54**(4): 549–555.
**Publisher Full Text**

Lewinsohn PM, Seeley JR, Roberts RE, *et al.*: **Center for Epidemiologic Studies Depression Scale (CES-D) as a screening instrument for depression among community-residing older adults.** *Psychol Aging.* 1997; **12**(2): 277–287.
**PubMed Abstract** | **Publisher Full Text**

Locke EA: **Social foundations of thought and action: A social-cognitive view.**

*Acad Manage Rev.* 1987; **12**(1): 169–171.
**Publisher Full Text**

Lopes RT, Gonçalves MM, Machado PP, *et al.*: **Narrative therapy vs. cognitive-behavioral therapy for moderate depression: Empirical evidence from a controlled clinical trial.** *Psychother Res.* 2014; **24**(6): 662–674.
**PubMed Abstract** | **Publisher Full Text**

Malagón-Amor Á, Córcoles-Martínez D, Martín-López LM, *et al.*: *Hikikomori* **in Spain: A descriptive study.** *Int J of Soc Psychiatr.* 2014; **61**(5): 475–483.
**PubMed Abstract** | **Publisher Full Text**

Mar RA, Oatley K, Hirsh J, *et al.*: **Bookworms versus nerds: Exposure to fiction versus non-fiction, divergent associations with social ability, and the simulation of fictional social worlds.** *J Res Pers.* 2006; **40**(5): 694–712.
**Publisher Full Text**

Mar RA, Oatley K, Peterson JB: **Exploring the link between reading fiction and empathy: Ruling out individual differences and examining outcomes.** *Commun.* 2009; **34**(4): 407–428.
**Publisher Full Text**

Mazzocco PJ, Green MC, Sasota JA, *et al.*: **This story is not for everyone: Transportability and narrative persuasion.** *Soc Psychol Personal Sci.* 2010; **1**(4): 361–368.
**Publisher Full Text**

Mehrabian A, Epstein N: **A measure of emotional empathy.** *J Pers.* 1972; **40**(4): 525–543.
**PubMed Abstract** | **Publisher Full Text**

Merry SN, Stasiak K, Shepherd M, *et al.*: **The effectiveness of SPARX, a computerised self help intervention for adolescents seeking help for depression: Randomised controlled non-inferiority trial.** *BMJ.* 2012; **344**: e2598.
**PubMed Abstract** | **Publisher Full Text** | **Free Full Text**

Mojdeh S, Zamani M, Kooshki AM, *et al.*: **Effect of watching a movie on family members' anxiety level during their relatives' surgery.** *Iran J Nurs Midwifery Res.* 2013; **18**(4): 329–332.
**PubMed Abstract** | **Free Full Text**

Naziri GH, Ghaderi Z, Fateme Z: **The effect of narrative therapy on decrease depression's female of Marvdasht.** *Journal Female and Social.* 2010; **1**(2): 65–78.
**Reference Source**

Nonaka S, Sakai M: **Psychological factors associated with social withdrawal (Hikikomori).** *Psychiatry Investig.* 2021; **18**(5): 463–470.
**PubMed Abstract** | **Publisher Full Text** | **Free Full Text**

Oatley K: **Why fiction may be twice as true as fact: Fiction as cognitive and emotional simulation.** *Rev Gen Psychol.* 1999; **3**(2): 101–117.
**Publisher Full Text**

Oatley K: **Emotions and the story world of fiction.** In M. C. Green, J. J. Strange, & T. C. Brock, (Eds.), *Narrative impact: Social and cognitive foundations.* Mahwah: Lawrence Erlbaum. 2002; 39–70.
**Reference Source**

O'Reilly P: **Methodological issues in social support and social network research.** *Soc Sci Med.* 1988; **26**(8): 863–873.
**PubMed Abstract** | **Publisher Full Text**

Osanai H, Kusumi T: **Reliability and validity of the Narrative Transportation Scale in Japanese.** *Jpn J Pers.* (In Japanese with English abstract.) 2016; **25**(1): 50–61.
**Publisher Full Text**

Otaya S: **Social participation through youth support that provides "Ibasho": The case of a facility for social withdrawal.** *Soc Policy Labor Stud.* (In Japanese.) 2015; **7**(2): 106–118.
**Publisher Full Text**

Pelowski M, Akiba F: **A model of art perception, evaluation and emotion in transformative aesthetic experience.** *New Ideas Psychol.* 2011; **29**(2): 80–97.
**Publisher Full Text**

Petty RE, Cacioppo JT: **Communication and Persuasion: Central and peripheral routes to attitude change.** New York, NY: Springer. 1986.
**Publisher Full Text**

Phillips BJ, McQuarrie EF: **Narrative and Persuasion in fashion advertising.**

*J Consum Res.* 2010; **37**(3): 368–392.
**Publisher Full Text**

Saito K: **Hikikomori no hyouka: shien ni kansuru gaidorain**. Tokyo: Japan's Ministry of Health, Labour and Welfare, 2010.
**Reference Source**

Saito T: **Shakaiteki hikikomori: Owaranai shishunki.** (Societal hikikomori: Unending adolescency). PHP-Kenkyujo, Tokyo. 1998.
**Reference Source**

Saito T: **Otaku to Hikikomori (tokushu,tomodachi ga dekinai ko).** *Child Study.* 2009; **63**(16): 108–113.
**Reference Source**

Saito T: **Chuukounen Hikikomori.** Gentoushashinsho. 2020.

Sakakibara M, Teramoto Y, Tani I: **Development of a short-form self-report measure to assess relaxation effects.** *Shinrigaku Kenkyu.* (In Japanese with English abstract.) 2014; **85**(3): 284–293.
**PubMed Abstract** | **Publisher Full Text**

Sakamoto N, Martin RG, Kumano H, *et al.*: **Hikikomori, is it a culture-reactive or culture-bound syndrome? Nidotherapy and a clinical Vignette from Oman.** *Int J Psychiat Med.* 2005; **35**(2): 191–198.
**PubMed Abstract** | **Publisher Full Text**

Slater MD: **Entertainment education and the persuasive impact of narratives**. In M. C. Green, J. J. Strange, & T. C. Brock (Eds.), *Narrative impact: Social and cognitive foundations*. Lawrence Erlbaum. 2002; 157–181.
**Reference Source**

Spielberger CD: **State-Trait Anxiety Inventory for Adults (STAI-AD)**. [Database record]. APA PsycTests. 1983.
**Publisher Full Text**

Stocks EL, Lishner DA, Decker SK: **Altruism or psychological escape: Why does empathy promote prosocial behavior?** *Eur J Soc Psychol.* 2008; **39**(5): 649–665.
**Publisher Full Text**

Suwa M, Suzuki K: **The phenomenon of "hikikomori" (social withdrawal) and the socio-cultural situation in Japan today.** *J Psychopathol.* 2013; **19**: 191–198.
**Reference Source**

Suzuki Y, Kino K: **Development of the Multidimensional Empathy Scale (MES).** *Jpn J Educ Psychol.* 2008; **56**(4): 487–497.
**Publisher Full Text**

Tajan N, Hamasaki Y, Dax NP: **Hikikomori: The Japanese Cabinet Office's 2016 Survey of acute social withdrawal.** *Asian Pac J.* 2017; **15**(5): 5017.
**Reference Source**

Taylor M: **Strategies of dissociation: A mimetic dimension to social problems in Japan.** *Anthropoetics.* 2006; **12**(1).
**Reference Source**

Tan MPJ, Lee W, Kato TA: **International experience of hikikomori (prolonged social withdrawal) and its relevance to psychiatric research.** *BJPsych Int.* 2021; **18**(2): 34–37.
**PubMed Abstract** | **Publisher Full Text** | **Free Full Text**

Teo AR, Gaw AC: **Hikikomori, a Japanese culture-bound syndrome of social withdrawal?: A proposal for DSM-5.** *J Nerv Ment Dis.* 2010; **198**(6): 444–449.
**PubMed Abstract** | **Publisher Full Text** | **Free Full Text**

Tokuda K: **The Validity of Temporary Mood Scale.** Ritsumeikan ningen kagaku kenkyū, 2011; **22**: 1–6.
**Reference Source**

van Laer T, de Ruyter K, Visconti LM, *et al.*: **The extended transportation-imagery model: A meta-analysis of the antecedents and consequences of consumers' narrative transportation.** *J Consum Res.* 2014; **40**(5): 797–817.
**Publisher Full Text**

Wada M, Zhao R, Xu Y: **Japanese Pre-Service Teacher's Manga Digital Storytelling.** *Multidisciplinary Approaches to Media Literacy: Research and Practice.* 2017; **1**(1): 196–215.
**Reference Source**

Weibel D, Stricker D, Wissmath B, *et al.*: **How socially relevant visual characteristics of avatars influence impression formation.** *J Media Psychol.* 2010; **22**(1): 37–43.
**Publisher Full Text**

# Open Peer Review

## Current Peer Review Status: ✔ ✔

---

**Version 2**

Reviewer Report 14 March 2022

https://doi.org/10.5256/f1000research.116159.r120633

✔ **Gloria Hongyee Chan** (iD)

Department of Social and Behavioral Sciences, City University of Hong Kong, Tat Chee Avenue, Kowloon Tong, Kowloon, Hong Kong

Given that the previous concerns have been addressed, there are no further comments.

*Competing Interests:* No competing interests were disclosed.

*Reviewer Expertise:* youth in cyber space, hikikomori

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

Reviewer Report 04 February 2022

https://doi.org/10.5256/f1000research.116159.r120634

✔ **Ali Evren Tufan** (iD)

Department of Child and Adolescent Psychiatry, Faculty of Medicine, Abant Izzet Baysal University, Bolu, Turkey

The authors addressed the limitations in the previous version of the manuscript. I have no further suggestions/ comments to make.

*Competing Interests:* No competing interests were disclosed.

*Reviewer Expertise:* statistics, epidemiology, child and adolescent psychiatry, developmental neuropsychiatry, biological psychiatry

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Version 1**

Reviewer Report 09 December 2021

https://doi.org/10.5256/f1000research.58968.r100325

**?**

**Gloria Hongyee Chan** (iD)

Department of Social and Behavioral Sciences, City University of Hong Kong, Tat Chee Avenue, Kowloon Tong, Kowloon, Hong Kong

Thank you for giving me such a great opportunity to review this article. Based on a psychiatric perspective, this article attempts to enrich the research on Hikikomori by investigating the relationship between the engagement in fictional narratives, emotional transportation, empathy, and the psychological state (level of depression and anxiety) in Hikikomori. It seeks not only to advance the study on Hikikomori but also generate practice implications, such as the use of Narrative Therapy for supporting this group of youth.

While the potential significance of the article is highly appreciated, I would like to express my concerns as follows:

1. Apart from the linkage between fictional consumption and empathy, the author could provide more illustrations for studying depression and anxiety as well.

2. Given that the results of the multiple regression analysis showed that the model investigating the predictability of emotional transportation and fictional consumption rate of empathy and relaxation explained 23.2% and 5% of the variance respectively, are there possibly other factors in the model, and worth noting them as a direction for future study?

3. Narrative Therapy is suitable for deconstructing Hikikomori's life experiences to achieve de-labeling of this group of youth and achieving empowerment of this group of youth through reconstructing their life experiences. It would be great if the author could demonstrate more the linkage of Narrative Therapy and your topic of study as practice implications.

4. As a minor comment, it would be great if taking another look at the citations (e.g., "According to one study conducted in South Korea, 56% of Hikikomori are at risk of internet

addiction, using the internet as their only way of communicating with the world (Chan & Lo, 2014). On the other hand, it has been suggested that internet usage, being the preferred communication and social tool used by Hikikomori, could be paradoxically beneficial for a Hikikomori's quality of life (Lee *et al*., 2013)" on p. 3 of the manuscript: The two references have to be swapped?)

On this account, I would suggest the author address the above concerns in order to further enhance the significance of this study.

**Is the work clearly and accurately presented and does it cite the current literature?**
Partly

**Is the study design appropriate and is the work technically sound?**
Partly

**Are sufficient details of methods and analysis provided to allow replication by others?**
Partly

**If applicable, is the statistical analysis and its interpretation appropriate?**
Partly

**Are all the source data underlying the results available to ensure full reproducibility?**
Yes

**Are the conclusions drawn adequately supported by the results?**
Partly

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** youth in cyber space, hikikomori

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

Author Response 17 Dec 2021
**Francesco Panto**, Tsukuba University , Faculty of Medicine, Tsukuba, Japan

Thank you for your kind response and your time dedicated to reading and reviewing our paper. We really appreciate your important contribution. We tried to make the specific corrections requested.

As follows

1. Apart from the linkage between fictional consumption and empathy, the author could provide more illustrations for studying depression and anxiety as well.

*Thank you for your indication. We added an explanation about the reasons for choosing these measures in the paragraph about Fictional narratives.*

2. Given that the results of the multiple regression analysis showed that the model investigating the predictability of emotional transportation and fictional consumption rate of empathy and relaxation explained 23.2% and 5% of the variance respectively, are there possibly other factors in the model, and worth noting them as a direction for future study?

*Thank you for your question, I added a little paragraph in the discussion confronting the other possible measures we can use in future studies.*

3. Narrative Therapy is suitable for deconstructing Hikikomori's life experiences to achieve de-labeling of this group of youth and achieving empowerment of this group of youth through reconstructing their life experiences. It would be great if the author could demonstrate more the linkage of Narrative Therapy and your topic of study as practice implications.

*Thank you for this important suggestion, I added similar programs we are taking as references and their effectiveness in the introduction, as well as similar approaches using narrative therapy with fictional narratives that we can use as a model for future studies.*

4. As a minor comment, it would be great if taking another look at the citations (e.g., "According to one study conducted in South Korea, 56% of Hikikomori are at risk of internet addiction, using the internet as their only way of communicating with the world (Chan & Lo, 2014). On the other hand, it has been suggested that internet usage, being the preferred communication and social tool used by Hikikomori, could be paradoxically beneficial for a Hikikomori's quality of life (Lee *et al.*, 2013)" on p. 3 of the manuscript: The two references have to be swapped?)

*Thank you for noticing the mistake, We apologize for missing this. I corrected as you kindly suggested.*

**Competing Interests:** No competing interests were disclosed.

Reviewer Report 06 October 2021

https://doi.org/10.5256/f1000research.58968.r95014

**?**  **Ali Evren Tufan** (iD)

Department of Child and Adolescent Psychiatry, Faculty of Medicine, Abant Izzet Baysal University,
Bolu, Turkey

Firstly, I would like to thank you for providing me the opportunity to review this interesting research. The authors of this multi-center, cross-sectional, clinic-based study evaluated 80 Japanese Hikikomori with self-reports evaluating empathy (Multidimensional Empathy Scale, MES); depression (CES-D), trait anxiety (STAI), self-reported relaxation (S-MARE), and narrative transportation (NTS-J). The design was exploratory and aimed to evaluate the relationships between those constructs with an eye to developing remotely applied narrative therapy for those individuals.

The authors report three main results;
1. Empathy levels among Hikikomori correlated with emotional transportation toward fictional narratives

2. Self-reported relaxation correlated with the frequency of consumption of such narratives

3. There were no relationships with depression and anxiety levels.

The study is novel and interesting and I would like to commend the authors, though with some reservations. Firstly, I believe the manuscript's prose may be improved for style, clarity, and flow. specifically;
- the authors may add the reference for the last sentence of the first paragraph of the introduction.

- the first sentence of the second paragraph of the introduction is a bit vague and this paragraph may be divided at the sentence outlining study aims.

- rather than "Bandura Social Learning Theory", "Social Learning Theory of Bandura" may be more appropriate.

- the sentence on excluding actively secluded Hikikomori as well as the last sentence in the procedures section should be revised for grammar.

Secondly, the methodology may be further clarified. Specifically;
- the definition of "high and low emotional transportation" for comparison of depressive scores may be added.

- the authors used the S-MARE in a modified manner (i.e. they asked the participants to recall their state after consumption of the fictional narrative) and as such, the scores for this instrument may be affected by recall bias.

- the authors also modified the use of NTS-J and reliabilities for those modifications may be reported.

- The Hikikomori status evaluation may also be improved further. The authors may add inter-rater reliabilities or whether they used consensus on status evaluations.

○ the authors also reported "extensive missing values" and that they used EM algorithms for missing data analysis but they did not report their results. Those results may be added.

○ the unit for age (i.e. years) may be added.

○ according to squared correlations, emotional transportation shared 25.0 % of the variance while fiction consumption rate and relaxation shared 9.0 %, what other factors may be responsible and be evaluated in further studies?

○ the authors reported using ANOVA for participants with habitual and not habitual consumption, n that case did they compare two or three groups? The first may be analyzed with a t-test.

○ considering the positive correlations between depression and trait anxiety, the results of the regression analyses may be affected by multi-collinearity. This information may be added to the results.

○ the rationale for measuring trait anxiety (vs. state) may also be further clarified.

Lastly, both the introduction and the discussion may benefit from the inclusion of some recent and related references. Suggested references may include;

○ Tan *et al.* International experience of hikikomori (prolonged social withdrawal) and its relevance to psychiatric research.[1]

○ Imai et al. The characteristics of patients with severe social withdrawal 'Hikikomori' in two community psychiatry clinics in Japan.[2]

○ Nonaka & Sakai. Psychological Factors Associated with Social Withdrawal (Hikikomori).[3]

○ Hihara *et al.* Positive and negative valences of identities: Longitudinal associations of identity content valences with adaptive and maladaptive functioning among Japanese young adults.[4]

○ Hamasaki *et al.* Identifying Social Withdrawal (Hikikomori) Factors in Adolescents: Understanding the Hikikomori Spectrum.[5]

Despite the above-mentioned limitations, the study is novel and has the potential to contribute to the literature. I commend the authors and suggest that they address those limitations which would further increase the scientific merit of the study.

**References**
1. Tan MPJ, Lee W, Kato TA: International experience of hikikomori (prolonged social withdrawal) and its relevance to psychiatric research.*BJPsych Int*. 2021; **18** (2): 34-37 PubMed Abstract | Publisher Full Text
2. Imai H, Takamatsu T, Mitsuya H, Mitsuya H, et al.: The characteristics of patients with severe social withdrawal 'Hikikomori' in two community psychiatry clinics in Japan.*Asian J Psychiatr*. 2021; **65**: 102833 PubMed Abstract | Publisher Full Text
3. Nonaka S, Sakai M: Psychological Factors Associated with Social Withdrawal (Hikikomori). *Psychiatry Investig*. 2021; **18** (5): 463-470 PubMed Abstract | Publisher Full Text
4. Hihara S, Sugimura K, Umemura T, Iwasa Y, et al.: Positive and negative valences of identities:

Longitudinal associations of identity content valences with adaptive and maladaptive functioning among Japanese young adults.*Dev Psychopathol*. 2021. 1-15 PubMed Abstract | Publisher Full Text
5. Hamasaki Y, Pionnié-Dax N, Dorard G, Tajan N, et al.: Identifying Social Withdrawal (Hikikomori) Factors in Adolescents: Understanding the Hikikomori Spectrum.*Child Psychiatry Hum Dev*. 2021; **52** (5): 808-817 PubMed Abstract | Publisher Full Text

**Is the work clearly and accurately presented and does it cite the current literature?**
Partly

**Is the study design appropriate and is the work technically sound?**
Partly

**Are sufficient details of methods and analysis provided to allow replication by others?**
Partly

**If applicable, is the statistical analysis and its interpretation appropriate?**
Partly

**Are all the source data underlying the results available to ensure full reproducibility?**
Yes

**Are the conclusions drawn adequately supported by the results?**
Partly

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** statistics, epidemiology, child and adolescent psychiatry, developmental neuropsychiatry, biological psychiatry

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

Author Response 17 Dec 2021

**Francesco Panto**, Tsukuba University , Faculty of Medicine, Tsukuba, Japan

Thank you for your detailed and accurate comments. I appreciate greatly your contribution to our research. I tried to make the specific corrections requested.

As follows
- the authors may add the reference for the last sentence of the first paragraph of the introduction.

    *I added the already listed reference which points out the presence of the Hikikomori phenomenon in other countries besides Japan.*

- the first sentence of the second paragraph of the introduction is a bit vague and this paragraph may be divided at the sentence outlining study aims.

  *I apologize if I misunderstood, however, I divided the paragraph talking about comorbidities and the paragraph starting with the relationship with internet addiction.*

- rather than "Bandura Social Learning Theory", "Social Learning Theory of Bandura" may be more appropriate.

  *Thank you for your accurate comment, I fixed the text with the correct terminology.*

- the sentence on excluding actively secluded Hikikomori as well as the last sentence in the procedures section should be revised for grammar.

  *I apologize for the inaccurate grammar, I tried to reformulate the sentence.*

- Secondly, the methodology may be further clarified. Specifically; the definition of "high and low emotional transportation" for comparison of depressive scores may be added.

  *I added the definition of high and low emotional transportation for this study. The definition is relative and regards the score of the scale.*

- the authors used the S-MARE in a modified manner (i.e. they asked the participants to recall their state after consumption of the fictional narrative) and as such, the scores for this instrument may be affected by recall bias.

  *Thank you for pointing out this possibility, I added a sentence declaring the above.*

- the authors also modified the use of NTS-J and reliabilities for those modifications may be reported.

  *I  explained the rationale for this choice as well as the pertinent literature.*

- The Hikikomori status evaluation may also be improved further. The authors may add inter-rater reliabilities or whether they used consensus on status evaluations.

  *I added a statement about the consensus in the Japanese psychiatric community about the scale we used as well as the literature referring to the measures.*

- the authors also reported "extensive missing values" and that they used EM algorithms for missing data analysis but they did not report their results. Those results may be added.

  *Thank you for pointing out this important detail, I added the Little's MCAR test as well as the percentage of the missing data. However, it is necessary I can add the figure of  EM algorithms pertinent to the results for each variable.*

○ the unit for age (i.e. years) may be added.

*I added the unit.*

○ according to squared correlations, emotional transportation shared 25.0 % of the variance while fiction consumption rate and relaxation shared 9.0 %, what other factors may be responsible and be evaluated in further studies?

*I tried to explain other possibilities as well as possible measures we can use in future studies.*

○ the authors reported using ANOVA for participants with habitual and not habitual consumption, n that case did they compare two or three groups? The first may be analyzed with a t-test.

*I apologized for the difficulty In interpreting the text. I confirm that we used ANOVA because the comparison is between 3 groups. Specifically, 1) habitual consumption  2) no habitual consumption (from time to time group ) 3) no habitual consumption (nothing at all group)*

○ considering the positive correlations between depression and trait anxiety, the results of the regression analyses may be affected by multi-collinearity. This information may be added to the results.

*I added the information, thank you for the indication*

○ the rationale for measuring trait anxiety (vs. state) may also be further clarified.

*I added the explanation for this choice in the paragraph relative to the measure used for anxiety.*

○ Lastly, both the introduction and the discussion may benefit from the inclusion of some recent and related references. Suggested references may include;

Thank you for your kind remark, I appreciate your contribution searching for pertinent papers. I Added the suggestions as follows:

1. Tan *et al.* International experience of hikikomori (prolonged social withdrawal) and its relevance to psychiatric research. ⇨ *introduction*
2. Imai et al. The characteristics of patients with severe social withdrawal 'Hikikomori' in two community psychiatry clinics in Japan. ⇨ *introduction*
3. Nonaka & Sakai. Psychological Factors Associated with Social Withdrawal (Hikikomori). ⇨ *discussion*
4. Hihara *et al.* Positive and negative valences of identities: Longitudinal associations of identity content valences with adaptive and maladaptive functioning among Japanese young adults. ⇨ *introduction*

5. Hamasaki *et al.* Identifying Social Withdrawal (Hikikomori) Factors in Adolescents: Understanding the Hikikomori Spectrum ⇨ *discussion*

***Competing Interests:*** No competing interests were disclosed.

The benefits of publishing with F1000Research:

- Your article is published within days, with no editorial bias

- You can publish traditional articles, null/negative results, case reports, data notes and more

- The peer review process is transparent and collaborative

- Your article is indexed in PubMed after passing peer review

- Dedicated customer support at every stage

For pre-submission enquiries, contact research@f1000.com          F1000Research