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Gender differences in psychological symptoms and psychotherapeutic processes in Japanese children

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Abstract: Gender differences have been documented in the prevalence of psychological symptoms. Tic disorders and ASD are more common in male clinical samples, while selective mutism and trichotillomania are more common in female clinical samples. In a review of 84 published case studies of Japanese children, this study explores gender differences in the prevalence of four categories of symptoms and expressions made in therapy for tics, selective mutism, trichotillomania, and autism spectrum disorder (ASD). Case studies were evaluated using both qualitative coding and statistical analysis. The findings were mostly consistent with epidemiological surveys and empirical research on adults. The gender differences in symptom prevalence and their expression can be summarized as differences in more direct aggression for boys versus indirect aggression for girls. The objective and progress in the therapy are to control impulsive energy for boys and to express energy for girls.

Keywords: Gender Differences; Tic disorder; Selective Mutism; Trichotillomania; Autism Spectrum Disorder; Aggression

1. Introduction

The prevalence of some psychological symptoms and disorders are known to differ between genders [1,2]. Further research into this phenomenon can shed light onto the development of and the potential mechanisms for not only these symptoms, but also gender differences in psychological processes more generally. The World Mental Health Survey is a worldwide epidemiological survey of psychological symptoms which shows such gender differences, but only includes symptoms in adulthood, not childhood [3,4]. To date, there is no comparably large-scaled, multi-national survey of psychological symptoms in children.

One relatively dramatic example of gender differences in disorder prevalence occurs with the eating disorders, anorexia nervosa and bulimia nervosa, which are roughly 2-3 times more common among females than males, particularly in developed countries [5,6]. DSM-IV-TR reported that the prevalence of anorexia nervosa was 0.5% and that of bulimia nervosa between 1 to 3 %. The ratio of males to females was 1 to 10. One of the main hypotheses posits that exposure to mass media and gender-relevant cultural socialization processes are in part responsible for this difference, with early adolescence being a particularly sensitive period for risk and onset [7,8,9].

Similarly, one theoretical theme by which to describe gender differences in disorder prevalence is whether the disorder is marked by externalizing versus internalizing behavior, given that socialization processes in some cultures may lead to the tendency for males to externalize and females to internalize [10,11]. For example, this has been offered as an argument for why boys are more likely to be diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) at a ratio of about four boys to every one girl in community samples [12,13]. Rather than boys necessarily being more vulnerable to ADHD, this hypothesis proposes that girls are more likely to have internalized, rather than externalized symptoms, which increases the likelihood for girls to be overlooked at possible points of intervention, such as when a student's behavior is disruptive and gets a teacher's attention.

Thus, given that understanding gender differences in symptom onset and progression in early critical periods may improve the effectiveness of intervention efforts, thereby improving long-term outcomes and given that the specifics of socialization with implications for gender may differ across cultures [14], the current research was an exploratory study focusing on clinical case studies within Japan to complement the existing epidemiological evidence. The relatively less-studied gender differences in prevalence for four disorders, tic disorder, selective mutism, trichotillomania, and Autism Spectrum Disorder (ASD), were examined. Expressions (e.g. behaviors) that occurred in psychotherapy were also examined by disorder type and gender to further understand how these differences may manifest when a child is working with a clinician. Although an exploratory study, the research team's collective clinical observations in psychotherapy and play therapy suggest that these four disorder categories may follow similar patterns in gender differences. Furthermore, a review of the literature showed similar gender differences in child prevalence, at least in epidemiological surveys (see Table 1 for summary).

Table 1. Summary of prevalence and gender differences in existing epidemiological resources.

Symptom	Prevalence	Gender difference	Source
Tic disorder	10-20%	More commonly observed among boys	Japanese Ministry of Health, Labour, and Welfare's Textbook for Medical Treatment of Children's Mental Health for Pediatricians [18]
Tourette's syndrome	0.3%	3 boys: 1girl	2009 U.S. survey by Scahill, L. B. R. H et al. [17]
Tourette's syndrome	0.003%	2 boys: 1 girl	ICD-10 [16]
Tourette's syndrome	0.008%	4 boys: 1 girl	DSM-5 [15]
Tourette's syndrome	0.003%	3 boys: 1 girl	2007 U.S. National Survey of Children's Health [19]
Selective Mutism	0.1-0.5%	1 boy : 1.6 girls	Japanese Ministry of Health, Labour, and Welfare's Textbook for Medical Treatment of Children's Mental Health for Pediatricians [18]
Selective Mutism	0.03-1%	More commonly observed in girls	ICD-10 [16] ; DSM-5 [15]
Selective Mutism	0.03-1.89%	1boys: 0.4-1.5 girls	review by Cho & Sonoyama [20]
Selective (Elective) Mutism	-	1boy: 1.5-2.6 girls	U.S. survey by Steinhausen. H.C. & Juzi,C. [23]
Trichotillomania	1-3%	1 boy: 3 girls	Japanese Ministry of Health, Labour, and Welfare's Textbook for Medical Treatment of Children's Mental Health for Pediatricians [18]
Autism Spectrum Disorder	0.19%	4boys: 1girl	U.S. Centers for Disease Control and Prevention [29]
Autism Spectrum Disorder	0.1-0.2%	5 boys: 1 girl	Japanese Ministry of Health, Labour, and Welfare's Textbook for Medical Treatment of Children's Mental Health for Pediatricians [18]
Autistic Spectrum Disorder	0.007-0.72%	4.2 boys: 1girl	review of 43 papers published between 1966 and 2008 by Fombonne, E. [31]
Autism Spectrum Disorder	0.019%	4.3boys: 1girl	U.S. Survey in 2020 by Maenner,M.J.et al.[33]
Autism	0.27%	2.5boys: 1girl	Japan Servey in 2005 by Honda, H. et al. [34]

Tic disorder

Tics refer to compulsive, externalized behavioral tendencies such as sudden twitches, movements, or verbalizations [15,16]. While tics are most commonly associated with Tourette syndrome, the DSM-5 and ICD-10 also recognize that tics appear as symptoms of other diagnoses including an unspecified tic disorder, among others [15,16]. Although there is some variability in the

specific estimate in the literature, the overall tendency for tics is that it appears more prevalent among boys, such as in the case of Tourette's syndrome, for which there are three boys for each girl diagnosed [17].

Selective mutism

Selective mutism refers to a psychological condition that usually affects children, and is characterized by a continuous refusal to speak in social situations by a child who is otherwise physically able and willing to speak to selected persons [15,16]. Although there is greater variability in the estimated prevalence of selective mutism in existing research than for tic disorders, most evidence indicates that girls are more likely to exhibit this symptom. For example, one recent review found the range of prevalence to be between 0.03 % and 1.89 % across 13 studies, but the ratio of boys to girls to be one boy to every 0.4 -1.5 girls [20]. Other surveys also found more prevalence of boys than girls [21,22], the ratio of boys to girls is between 1 : 2.6 and 1 : 1.5 [23].

Trichotillomania

In the DSM-5, trichotillomania is classified as a disorder related to obsessive-compulsive disorder. The diagnosis of trichotillomania considers the presence or absence of hair pulling, the extent of hair loss, and subsequent functional impairment, such as withdrawing from social outings due to worries over the hair's appearance, while ruling out alternative causes such as autoimmune disease, an atopic predisposition, or type 1 diabetes [24]. The empirical evidence regarding the magnitude of gender differences for trichotillomania is mixed. In clinical research, the ratio of boys to girls with trichotillomania is around 1:8 to 1:10 [25]. In one study examining over 2,500 students, prevalence was estimated at 1.5% of males and 3.4% of females [26]. However, this study included all cases with hair-pulling symptoms, even those cases which did not fully meet the DSM-5 criteria for trichotillomania. A clinical survey of 266 cases organized by Japan Trichotillomania Improvement Association found females made up the majority of cases at 93.7% [27]. However, this clinical survey was not limited to childhood trichotillomania. In contrast, epidemiological research shows a smaller gender gap, with about one boy for every two girls meeting the diagnostic criteria above. Still, at least one epidemiological survey found no significant gender difference across 10,169 adults, with 1.8% of males and 1.7% of females having trichotillomania [28]. One possible interpretation for these varying estimates is that girls are more likely to present for psychotherapeutic services than are boys, leading to overrepresentation in clinical estimates, but generally the literature for this disorder is more limited than some of the other disorders included in the current research such as ASD. Generally, however, there is a tendency for trichotillomania to be more prevalent among females than among males, particularly with regard to children.

Autism spectrum disorder (ASD)

Autism spectrum disorder is a neurodevelopmental disorder in which symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning. According to the DSM-5 [15], ASD refers to "persistent deficits in social communication and social interaction", and "restricted, repetitive patterns of behavior, interests, or activities." The estimated prevalence for autism and for ASD has been on the rise, compared to early estimates. For example, in 1979, autism was estimated to occur in 5 per 10,000 individuals and ASD to occur in 21 per 10,000 individuals [30]. A review of 43 papers published between 1966 and 2008 found the prevalence of autistic disorder estimates ranged widely from 0.7 per 10,000 individuals to 72.6 per 10,000 individuals [31]. This review also found a significant positive correlation between prevalence and the year of publication. Furthermore, all the studies that reported a prevalence higher than 7 per 10,000 individuals had been published after 1987. More recently, a 2009 survey estimated autism to occur in 41 per 10,000 individuals and ASD to occur in 157 per 10,000 individuals [32]. A theoretical question remains over whether the rise in prevalence for both autism and ASD is due to an increase in the objective number of people with these disorders or due to a greater recognition of these disorders and their diagnostic criteria by clinicians, parents, and educators. As to the gender difference, the mean male:female ratio shown in the above review paper was 4.2:1. This is consistent

with several other surveys showing that boys are 4.3 times more likely to exhibit ASD symptoms than are girls [33]. A cohort study in Japan showed that the ratio of males to females for the autism was 2.5:1 [34].

In summary, tic disorders and ASD appear to be more common in males, while selective mutism and trichotillomania appear to be more common in females. We hypothesized that there may be similar gender differences when examining clinical child case studies in Japan, as a complement to the epidemiological and clinical survey. We also hypothesized that children may differ in how they express themselves in psychotherapy as a function of these disorders. Consequently, we hypothesized that gender differences in disorders may also be observed in these self-expressions in psychotherapy.

Five of authors of this paper are psychotherapists with a dynamic psychotherapy orientation, with a particular focus on analytical psychology, which uses images such as dreams and expressions by drawings in psychotherapy. Based on the research team's collective clinical observations of children during sandplay therapy in which children create scenes or landscapes in a sandbox with miniature toys, boys were more likely to create scenes that involved fighting or wars, whereas girls were more likely to create enclosed spaces in the sand, such as houses with rooms.

Therefore it may be that boys tend to build a sense of self through encounters and fights against the 'other', while girls build a sense of self by closure and inward-focus. Thus, if the gender ratio for a particular disorder in the case studies differed from 1:1, we might also observe differences in how children expressed themselves in therapy as a function of these disorders. We hypothesize that the direction of aggression is different according to disorders. In the case of tic disorder and ASD, in which more male prevalence is expected, aggression would be more directly and externalized, while in case of selective mutism and trichotillomania, in which more female prevalence is expected, dominance aggression would be directed more inwardly and restrained. Aggression was defined in this study as an intention and behavior to attack others or objects physically and/or psychologically. As such, we expected to see gender differences in the analyzed case studies, such that boys will display more externalizing behaviors, while girls will display more internalizing behaviors.

2. Materials and Methods

In order to explore gender differences in the prevalence of these four relatively less-studied disorders and to subsequently examine how children respond to express themselves in psychotherapy, a team of five experienced psychotherapists analyzed 84 published child case studies. This was done by qualitatively coding the psychotherapeutic sessions by recording the expression of symptoms and turning points in the psychotherapeutic process.

For the analysis of case studies, we selected three leading Japanese Clinical Psychology journals: The Journal of Japanese Clinical Psychology, as a primary journal for clinical psychology in Japan, as well as the Archives of Sandplay Therapy and the Japanese Journal of Play Therapy, both of which are leading child psychotherapy journals in Japan. Finally, to include cases prior to 1983, Kyoto University's Annual Report of the Institute for Psychotherapy volumes 1 through 10 were included, resulting in cases from 1974 onward.

Within the journals, articles were selected by searching the titles and keywords for the following terms: "tic disorder", "Tourette syndrome", "mutism", "selective mutism", "trichotillomania", "ASD (autism spectrum disorder)", "autism" and "Asperger". Parent case studies and survey papers were excluded from the analyzed sample. This resulted in a total of 84 cases, 10 case studies for tic disorders, 21 cases for selective mutism, 7 cases for trichotillomania, and 48 for ASD. It should also be noted that the DSM-5's current description of ASD is one iteration reflecting a number of earlier changes in both the criteria and approach to diagnosis for ASD [35]. In consideration of these changes over time and because the case studies analyzed here are taken from several decades, the current ASD diagnosis was included in addition to severe autism [36], the DSM-III's Pervasive Developmental Disorder (1980), DSM-III-TR's pervasive developmental disorder-not otherwise specified (1987), and three disorders in DSM-IV (1994), including Autistic Disorder, Asperger's Disorder, and Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS).

Each case was discussed by five experienced psychotherapists to identify 1) the characteristic psychological problems of the case, and 2) the kind of progress or improvement which occurred during therapy. This research was approved by the Ethical Review Committee for Clinical Psychology Research at Kyoto University with the ethical approval code 20003.

3. Results

3.1. *Qualitative observations of the case studies*

3.1.1. *Tic disorder.*

While the search resulted in eight case studies for tic disorders, two ASD cases also contained tic symptomology, which we included in the analyses for tic disorders (and removed from ASD) resulting in ten cases of tic disorder. The cases consisted of 9 boys and 1 girl, whose ages ranged from 3 to 15 years ($M = 8.30$; $SD = 3.07$). This gender difference is consistent with existing research for tic disorders. As is typical for tic disorders, aggression was a common complaint in these case studies [37]. Boys were described as showing aggression more directly (such as hitting someone or something, biting the therapist, shouting abusive language) whereas girls were described as showing aggression relatively more indirectly (such as using sarcastic tones while speaking, presenting cruel and grotesque stories and pictures in therapy, for example, a girl said, "There are many babies. They are dead. They are smeared with red blood."). Secondly, we found that over the course of therapy, children tended to increasingly express their thoughts and feelings more verbally. For example, a boy who shouted "silly" as a vocal tic, later became able to verbally articulate criticisms in complete sentences. Third, we observed a gradual increase in the ability to control impulses and aggression. For example, a boy who could not initially control his shots in a ball game with the therapist and who would often use brute force, later made slower pitches and accepted time out. A fourth observation was the emergence of the sense of differentiating between 'good' and 'bad'. For example, a boy began to present a story about police cars versus a criminal in the therapy course. Finally, in play therapy, we observed that a 'passage' structure, such as a road or a circuit was often built, possibly symbolizing an adequate flow of energy. For example, a boy who drew a congested road at first drew a road where cars drove smoothly in the later phases of therapy. We argue that these changes symbolize the ability to control aggression.

3.1.2. *Selective mutism*

The 21 cases of selective mutism consisted of 5 boys and 16 girls, whose ages ranged from 4 to 15 years ($M = 9.29$; $SD = 3.21$). This aligns with existing research reviewed earlier. In case studies which included play therapy and sandplay for selective mutism, 7 of the 21 cases described children who placed all play items into a container or into a space that was contained by fences. We posit that this mirrors the inherent nature of selective mutism as a symptom, in which inner psychological life exists, but cannot be expressed.

In 12 of the 21 cases, children often used rare or unusual items or toy animals rather than everyday animals (such as snakes and frogs instead of dogs and cats), which we argue indicates hidden and repressed psychological contents of these children compounded by the symptom of selective mutism. Consistent with these observations, the turning point in psychotherapy among selective mutism cases was often a moment characterized by discharge and expression. For example, the child was laughing or making a loud sound by using a horn. Alternatively, the therapeutic moment might be where expression was more subtle, such as by creating stories or pictures in the course of therapy. For example, a child drew a self-portrait or brought in a picture from home to the therapy sessions. Such an act suggests that the child could develop self-consciousness and self-reflection. This duality of self has to do with the two layers of the world expressed in the therapy. For example, in the client's story, there was another world below ground which was different from the normal world, where both treasures and something scary existed. In some cases, other evidence of

therapeutic progress was observed toward the end of therapy, such as when the child would build a toy house and permit a figure to enter it.

Consistent with the tic disorder case studies, boys tended to show aggression directly and simply, very often physically, whereas girls expressed aggression more indirectly and complexly, i.e. psychologically. The indirect and complex aggression commonly shown by girls was not direct with violence or attacking the therapist, but more elaborated and vicious. For example, a girl played with grotesque animal items and presented grotesque stories in therapy such as she made a snake bite one of the important dolls in the story.

One unexpected observation among the team of psychotherapists was that children in selective mutism case studies often showed a conflict about his/her gender. For example, a girl said that she was a boy because her mother wanted a boy.

3.1.3. *Trichotillomania*

The seven cases of trichotillomania consisted of one boy and six girls, and their ages ranged from 8 to 14 years ($M = 11.29$; $SD = 1.83$). This gender ratio is also consistent with previous surveys on prevalence. Much like selective mutism, in the cases of trichotillomania aggression was expressed indirectly. However, in contrast to selective mutism, the expressions were simpler in trichotillomania cases. For trichotillomania, there were less symbolic processes. For example, during sand play therapy, the theme of the play therapy did not develop and was mainly about the patient's aggression towards his or her mother, such as when a girl forced her mother who was very reluctant to draw a picture to participate in a mutual picture-drawing game with her and her therapist.

3.1.4. *ASD*

There were 48 case studies for ASD consisting of 39 boys and 9 girls, and their ages ranged from 1 to 15 years ($M = 6.58$; $SD = 3.83$). This gender difference is consistent with epidemiological surveys listed in Table 1. The search result for ASD yielded the most case studies relative to the other selected symptoms, which aligns with the trend towards growing ASD prevalence. However, this increase may in part be driven by an overgeneralization of ASD rather than an objective increase in its occurrence. Specifically, in Japan, psychiatrists and psychotherapists tend to give the diagnosis of ASD more than necessary [38,39]. For example, in the current review of published cases studies, we argue that five cases were wrongly diagnosed as ASD. There was consensus among the research team that two boys were more likely cases of tic disorders, and were analyzed with tic disorders and not ASD. There was also consensus that three case studies with girls also may not be consistent with an ASD diagnosis and were omitted from all analyses. One case seemed to present with an attachment disorder and relational conflict with her mother. A second case appeared to have an anxiety disorder with interpersonal conflict. Finally, a third case was most likely thought to be panic disorder. As a result, we analyzed 43 cases (37 boys; 6 girls) for ASD.

One characteristic of children with ASD is the difficulty in differentiating between self and other, as well as between existence and non-existence. Thus, the therapeutic process often focuses on the establishment of these psychological differentiations [40]. Observations in the case studies were consistent with this aspect such that separation was a central theme, (e.g. between client and mother, between client and therapist, and even between items in the therapy room where the client can play).

Another common theme was direct physical contact with the therapist. For example, children in these case studies hit or bit the therapist, which the team interpreted as a primitive way of differentiating between the other and one's self. Children in ASD case studies were also likely to enter into various small spaces such as a box house or sand tray, which likely provides a feeling of containment and embodiment, i.e. a secure base [41]. Later in the psychotherapeutic process, some children added toys to these contained spaces. Another frequent occurrence in ASD cases was children using mirrors for self-gaze, suggesting further development of a sense of self and differentiation of self and others [42]. In 12 of the 43 ASD cases, physical excretion or discharge such as urination and defecating occurred while in the play room, perhaps as a means of physical expression of the self [43]. Making the sandbox empty and the use of the number zero happened in

some cases. This symbolizes finding a starting base and point [44]. Over the course of therapy, children sought out height, such as playing with tall items or climbing up to an elevated place, which may have to do with the emergence of an agentic subject and self.

Conventionally, psychotherapy focuses on psychological contents such as parental conflicts, anxiety, desire and self-control. However, psychotherapy for the treatment of ASD more specifically focuses on the establishment of the sense of self and psychological structure such as separation of self and other and differentiation of existence and non-existence [40]. Only after the establishment of these bases, more conventional contents such as spontaneous appearance of symbolized story and picture are addressed later. Our analysis of cases of selective mutism showed that these cases have already established psychological structure of self-consciousness, two layers of world and indirect expression. This structure is lacking or weak in case of ASD and should be developed through the therapy. Due to this, psychotherapy with children diagnosed with ASD tends to be more intensive and difficult than other psychotherapies. This was mirrored in the analysis where we found that in 11 of the 43 cases, progress was relatively minor, which is striking when all 43 cases were considered effective enough to be of interest for publication.

3.2. Quantitative analysis of the case studies

To more objectively evaluate the case studies, the team reviewed and scored all cases against a checklist. The same five psychotherapists created a checklist of behaviors and images which were regarded as characteristic and crucial for the therapeutic turning point for each disorder (Table 2). To determine whether some psychotherapeutic expressions were more common for certain symptoms, Fisher's exact tests were used to determine statistical significance. For statistically significant results, residual analyses were done to determine the specific factor driving a significant difference. Following recommendations by Cochran [45], we used Fisher's exact tests instead of χ^2 -tests because more than 20 % of cells had an expected value of less than 5. In Table 2, the shaded cells indicate statistical significance (defined as $p < 0.05$). Overall, the essential points derived from the qualitative discussion by the research team for each symptom were mostly supported by the results of the empirical analysis of the checklist.

3.2.1. Tic disorder

Tic disorder cases were more likely to feature "quality of aggression (direct and simple)" ($p < 0.01$), "change of symptom to verbal and humorous expression" ($p < 0.01$), "creation of interval and capacity to wait" ($p < 0.01$), "appearance of an image with a passage" ($p < 0.01$), "play demonstrating a differentiation between right and wrong" ($p < 0.05$), relative to selective mutism, trichotillomania and ASD. These findings are consistent with the observations of characteristic expressions of tic disorder in the qualitative review of the case studies. While these characteristic expressions were observed in the other three types of symptoms, these expressions were significantly more common in tic disorders cases.

3.2.2. Selective Mutism

Selective mutism cases were more likely to include "emergence of grotesque image and play" ($p < 0.01$), "change from controlled condition to laughter and making loud noise" ($p < 0.01$), "spontaneous appearance of symbolic story and picture" ($p < 0.01$), "emergence of self-portrait" ($p < 0.01$), "emergence of two layers of expression" ($p < 0.01$), "theme of gender conflict" ($p < 0.01$), "making a house and making a space for figures" ($p < 0.01$), and "quality of aggression (indirect and complicated)" ($p < 0.01$). Therefore 8 out of 23 characteristic expressions were significantly more common in selective mutism relative to tics, trichotillomania and ASD. This was also the highest number of characteristic expressions among the four symptom categories. Similarly, most of these features were also observed as characteristic for selective mutism in the qualitative review. However, we expected that "filling a container or fenced place with items," to be characteristic of selective mutism, but there was no statistically significant difference compared to other categories.

3.2.3. Trichotillomania

Trichotillomania showed significantly more “aggression against mother” ($p < 0.01$), “expression through images without symbolic development” ($p < 0.01$), “quality of aggression (indirect and complicated)” ($p < 0.01$) relative to tics, selective mutism and ASD. Similarly, these were pointed out as typical expressions of trichotillomania in the review.

Table 2. The appearance of characteristic expressions and changes in psychotherapy.

Characteristic expressions	Symptoms								χ^2	p value
	Tic disorder		Mutism		Trichotillomania		ASD			
	Yes	No	Yes	No	Yes	No	Yes	No		
Quality of aggression (direct and simple)	9 (3.6)	1 (-3.6)	5 (-1.6)	16 (1.6)	0 (-2.2)	7 (2.2)	17 (0.2)	26 (-0.2)	Fisher's exact test	$p < 0.01$
Quality of aggression (indirect and complicated)	1 (-1.9)	9 (1.9)	13 (2.7)	8 (-2.7)	7 (3.6)	0 (-3.6)	9 (-3.2)	34 (3.2)	Fisher's exact test	$p < 0.01$
Change of symptom to verbal and humorous expression	9 (6.8)	1 (-6.8)	3 (-0.3)	18 (0.3)	1 (-0.1)	6 (0.1)	0 (-4.2)	43 (4.2)	Fisher's exact test	$p < 0.01$
Creation of interval and capacity to wait	9 (7.1)	1 (-7.1)	0 (-2.2)	21 (2.2)	0 (-1.2)	7 (1.2)	3 (-2.1)	40 (2.1)	Fisher's exact test	$p < 0.01$
Play demonstrating a differentiation between right and wrong	4 (3.1)	6 (-3.1)	1 (-1.1)	20 (1.1)	0 (-1.0)	7 (1.0)	4 (-0.6)	39 (0.6)	Fisher's exact test	$p < 0.05$
Appearance of an image with a passage	6 (4.6)	4 (-4.6)	2 (-0.6)	19 (0.6)	0 (-1.1)	7 (1.1)	3 (-1.8)	40 (1.8)	Fisher's exact test	$p < 0.01$
Filling a container or fenced place with items	1 (-0.6)	9 (0.6)	7 (2.5)	14 (-2.5)	1 (-0.1)	6 (0.1)	4 (-1.8)	39 (1.8)	Fisher's exact test	$n.s.$
Emergence of grotesque image and play	2 (0.0)	8 (0.0)	12 (5.0)	9 (-5.0)	0 (-1.4)	7 (1.4)	2 (-3.6)	41 (3.6)	Fisher's exact test	$p < 0.01$
Change from controlled condition to laughter and making loud noise	1 (-1.3)	9 (1.3)	15 (5.3)	6 (-5.3)	0 (-1.7)	7 (1.7)	6 (-2.8)	37 (2.8)	Fisher's exact test	$p < 0.01$
Spontaneous appearance of symbolized story and picture	3 (-0.6)	7 (0.6)	15 (3.6)	6 (-3.6)	2 (-0.6)	5 (0.6)	11 (-2.5)	32 (2.5)	Fisher's exact test	$p < 0.01$
Emergence of self-portrait	0 (-1.3)	10 (1.3)	9 (4.9)	12 (-4.9)	0 (-1.0)	7 (1.0)	1 (-2.9)	42 (2.9)	Fisher's exact test	$p < 0.01$
Emergence of two layers of expression	0 (-1.6)	10 (1.6)	13 (5.9)	8 (-5.9)	0 (-1.3)	7 (1.3)	2 (-3.4)	41 (3.4)	Fisher's exact test	$p < 0.01$
Theme of gender conflict	0 (-1.0)	10 (1.0)	6 (3.8)	15 (-3.8)	0 (-0.9)	7 (0.9)	1 (-2.2)	42 (2.2)	Fisher's exact test	$p < 0.01$
Making a house and making a space for figures	2 (-0.4)	8 (0.4)	15 (5.8)	6 (-5.8)	0 (-1.6)	7 (1.6)	3 (-3.9)	40 (3.9)	Fisher's exact test	$p < 0.01$
Aggression against mother	1 (0.0)	9 (0.0)	2 (-0.1)	19 (0.1)	5 (5.7)	2 (-5.7)	0 (-3.2)	43 (3.2)	Fisher's exact test	$p < 0.01$
Expression through images without symbolic development	0 (-0.8)	10 (0.8)	0 (-1.2)	21 (1.2)	4 (6.7)	3 (-6.7)	0 (-2.2)	43 (2.2)	Fisher's exact test	$p < 0.01$
Task (or exchange) of separation from mother or therapist	3 (-0.5)	7 (0.5)	0 (-4.1)	21 (4.1)	1 (-1.3)	6 (1.3)	26 (4.6)	17 (-4.6)	Fisher's exact test	$p < 0.01$
Physical excretion and discharge in the play room	1 (-0.8)	9 (0.8)	3 (-0.7)	18 (0.7)	0 (-1.4)	7 (1.4)	12 (2.0)	31 (-2.0)	Fisher's exact test	$n.s.$
Direct physical contact with the therapist	1 (-1.2)	9 (1.2)	2 (-1.9)	19 (1.9)	1 (-0.7)	6 (0.7)	16 (2.8)	27 (-2.8)	Fisher's exact test	$n.s.$
Client's entering in the house box or sand tray	1 (-1.4)	9 (1.4)	4 (-1.1)	17 (1.1)	0 (-1.7)	7 (1.7)	18 (2.9)	25 (-2.9)	Fisher's exact test	$p < 0.05$
Emptying something	1 (0.3)	9 (-0.3)	0 (-1.5)	21 (1.5)	0 (-0.8)	7 (0.8)	5 (1.5)	38 (-1.5)	Fisher's exact test	$n.s.$
Play looking into the mirror	0 (-1.2)	10 (1.2)	1 (-1.1)	20 (1.1)	0 (-1.0)	7 (1.0)	8 (2.3)	35 (-2.3)	Fisher's exact test	$n.s.$
Emergence of the image of height	4 (1.3)	6 (-1.3)	1 (-2.3)	20 (2.3)	0 (-1.5)	7 (1.5)	14 (2.1)	29 (-2.1)	Fisher's exact test	$p < 0.05$

Note. Adjusted standardized residuals appear in parentheses below group frequencies.

3.2.4. ASD

As for ASD, “task (or exchange) of separation from mother or therapist” ($p < 0.01$), “client's entering in the house box or sand tray” ($p < 0.05$), “emergence of the image of height (for example, putting tall items, climbing up to high place)” ($p < 0.05$) were statistically more common relative to tics, selective mutism and ASD. Other expressions which were regarded as typical for the ASD such

as “physical excretion and discharge in the play room”, “direct physical contact with the therapist”, “emptying something”, “play looking into the mirror”, were not statistically more common.

In sum, these quantitative analyses support our proposal that specific symptom categories possess typical expressions. There were however characteristic expressions which we expected to be more common, but which were not statistically significant.

3.2.5. Gender differences in prevalence

To examine the relationship between gender and the characteristics of symptoms, we aggregated all four symptom categories to test whether characteristic expressions differed by gender. χ^2 -test or Fisher's exact test was used and was followed up with residual analyses. As in the case of analysis of symptoms, we used Fisher's exact test instead of χ^2 -test following the suggestion by Cochran [45], if there are more than 20 % of cells with an expected count of less than 5. Table 3 shows the comparison of symptoms in the case studies of boys and girls. Significance was once again defined as $p < 0.05$ and shaded cells indicate a significant gender difference.

Table 3 shows that there are gender differences in characteristic expressions and behaviors in psychotherapy. For boys, “quality of aggression (direct and simple)” ($p < 0.01$), “creation of interval and capacity to wait” ($p < 0.01$), “task (or exchange) of separation from mother or therapist” ($p < 0.05$), “emergence of the image of height (for example, putting tall items, climbing up to high place)” ($p < 0.05$) were more common than in girls. Those items which are found significantly more in boys than in girls are common in tic disorder and ASD.

In contrast, for girls “quality of aggression (indirect and complicated)” ($p < 0.01$), “filling a container or fenced place with items” ($p < 0.01$), “emergence of grotesque image and play” ($p < 0.01$), “change from controlled condition to laughter and making loud noise” ($p < 0.01$), “spontaneous appearance of symbolized story and picture” ($p < 0.01$), “emergence of self-portrait” ($p < 0.01$), “emergence of two layers of expression” ($p < 0.01$), “theme of gender conflict” ($p < 0.01$), “making a house and making a space for figures” ($p < 0.01$), “aggression against mother” ($p < 0.01$), “expression through images without symbolic development” ($p < 0.05$) were more common. Those characteristics which are found significantly more in girls than in boys are common in selective mutism and trichotillomania. It is interesting to notice that “filling a container or fenced place with items,” which was supposed to be characteristic of selective mutism, but was not statistically significant, appeared statistically significant in girls.

4. Discussion

The current analyses suggest that there are not only gender differences in the prevalence of disorders / symptomology, but also gender-specific expressions of these disorders in psychotherapy. Taken together, we suggest that the psychotherapeutic expressions that characterize a disorder category will also be more common in a specific gender. The same psychotherapeutic expressions that characterize tic disorder and ASD were also more common in boys than in girls. Meanwhile, the psychotherapeutic expressions that characterize selective mutism and trichotillomania were also more common in girls compared to boys.

Specifically, the higher prevalence of selective mutism and trichotillomania in girls was accompanied by more complicated and indirect expressions of aggression. Meanwhile, the higher prevalence tic disorder in boys was associated with more direct expressions of aggression. For tic disorder and selective mutism for example, these expressions of aggression are mirrored by the characteristic symptomology and psychotherapeutic objectives. For tic disorder, the objective is to control impulsive energy, meanwhile for selective mutism the objective is to express hidden energy. Therefore, more direct aggression in the psychotherapeutic processes for tic disorder reflect the process of controlling impulsive energy. The indirect aggression in selective mutism reflects the existence of hidden energies and the expression of it. However, due to gender differences in aggression consistent with social understandings and expectations, it is an open question as to the influence of social and cultural factors on these different tendencies.

Table 3. The appearance of these characteristic expressions and gender difference.

Characteristic expressions	Gender differences				χ^2	p value
	Males		Females			
	Yes	No	Yse	No		
Quality of aggression (direct and simple)	26 (2.7)	30 (-2.7)	5 (-2.7)	25 (2.7)	7.51	$p < 0.01$
Quality of aggression (indirect and complicated)	11 (-4.1)	45 (4.1)	19 (4.1)	11 (-4.1)	16.42	$p < 0.01$
Change of symptom to verbal and humorous expression	8 (-0.3)	48 (0.3)	5 (0.3)	25 (-0.3)	Fisher's exact test	$n.s.$
Creation of interval and capacity to wait	12 (2.7)	44 (-2.7)	0 (-2.7)	30 (2.7)	Fisher's exact test	$p < 0.01$
Play demonstrating a differentiation between right and wrong	8 (1.6)	48 (-1.6)	1 (-1.6)	29 (1.6)	Fisher's exact test	$n.s.$
Appearance of an image with a passage	9 (1.2)	47 (-1.2)	2 (-1.2)	28 (1.2)	Fisher's exact test	$n.s.$
Filling a container or fenced place with items	4 (-2.8)	52 (2.8)	9 (2.8)	21 (-2.8)	Fisher's exact test	$p < 0.01$
Emergence of grotesque image and play	4 (-3.7)	52 (3.7)	12 (3.7)	18 (-3.7)	Fisher's exact test	$p < 0.01$
Change from controlled condition to laughter and making loud noise	8 (-3.3)	48 (3.3)	14 (3.3)	16 (-3.3)	10.76	$p < 0.01$
Spontaneous appearance of symbolized story and picture	12 (-3.9)	44 (3.9)	19 (3.9)	11 (-3.9)	14.88	$p < 0.01$
Emergence of self-portrait	0 (-4.6)	56 (4.6)	10 (4.6)	20 (-4.6)	Fisher's exact test	$p < 0.01$
Emergence of two layers of expression	2 (-4.6)	54 (4.6)	13 (4.6)	17 (-4.6)	21.45	$p < 0.01$
Theme of gender conflict	0 (-3.8)	56 (3.8)	7 (3.8)	23 (-3.8)	Fisher's exact test	$p < 0.01$
Making a house and making a space for figures	7 (-3.2)	49 (3.2)	13 (3.2)	17 (-3.2)	10.41	$p < 0.01$
Aggression against mother	1 (-3.3)	55 (3.3)	7 (3.3)	23 (-3.3)	Fisher's exact test	$p < 0.01$
Expression through images without symbolic development	0 (-2.8)	56 (2.8)	4 (2.8)	26 (-2.8)	Fisher's exact test	$p < 0.05$
Task (or exchange) of separation from mother or therapist	24 (2.1)	32 (-2.1)	6 (-2.1)	24 (2.1)	4.49	$p < 0.05$
Physical excretion and discharge in the play room	10 (-0.2)	46 (0.2)	6 (0.2)	24 (-0.2)	0.06	$n.s.$
Direct physical contact with the therapist	15 (1.1)	41 (-1.1)	5 (-1.1)	25 (1.1)	1.12	$n.s.$
Client's entering in the house box or sand tray	17 (1.0)	39 (-1.0)	6 (-1.0)	24 (1.0)	Fisher's exact test	$n.s.$
Emptying something	5 (1.0)	51 (-1.0)	1 (-1.0)	29 (1.0)	Fisher's exact test	$n.s.$
Play looking into the mirror	7 (0.8)	49 (-0.8)	2 (-0.8)	28 (0.8)	Fisher's exact test	$n.s.$
Emergence of the image of height	17 (2.5)	39 (-2.5)	2 (-2.5)	28 (2.5)	6.37	$p < 0.05$

Note. Adjusted standardized residuals appear in parentheses below group frequencies.

Children with selective mutism appear to have differentiated and reflective mental structures, as if there are two layers of their psychological world, where the self-reflective function is most dominant. For children with ASD, the primary issue appears to be building basic psychological structures. This contrast suggests girls may have better differentiated psychological structure than boys in clinical settings.

Our research investigated the prevalence of tic disorders, selective mutism, trichotillomania and ASD among Japanese children, and aimed to determine whether the psychotherapeutic expressions characteristic of each symptom category are also more common in certain genders. However, the question remains if whether similar gender differences would also exist for cases in which there are no gender-specific differences in the prevalence. Therefore, future research could explore whether gender-specific psychotherapeutic expressions also exist for a range of psychological symptoms.

It is, however, an open question if these gender differences concerning disorders and psychotherapy in our study are culturally and historically defined and limited. While the prevalence of gender differences was similar to international prevalence rates, our analyses were based on Japanese case studies. Further research with additional cultural comparisons is needed. Furthermore, it is important to study the change of psychological consciousness and disorders over time. For example, the prevalence of ASD is increasing in recent years. This has to do with the change of dominant consciousness from a modern, reflective one to the so-called postmodern consciousness which is characterized by dissociation and multiple selves [46,47]. The growing acceptance of sexual minorities in mainstream culture is another cultural change over time that may influence the understanding of gender, which in turn can have implications for gender differences in prevalence and in gender specific development. Our meta-analysis of case studies is based on cases in the last 50 years. Further study is needed to explore the change of disorder and psychotherapy concerning the gender difference is needed.

The current research presents a qualitative analysis performed by Japanese psychotherapists who assessed case studies of psychopathological symptoms and psychotherapeutic expressions in Japanese children originally reported by Japanese clinicians. While prevalence and symptomology largely align with epidemiological and clinical work from non-Japanese sources, we acknowledge the impact that cultural context has on informing manifestations and the diagnostic process [48, 49]. For example, Japan is known to have the culture-bound syndromes, Hikikomori (refusal to leave the bedroom [50]) and Taijin kyofusho (fear of awkward social behavior [51]), which are manifestations of social and environmental forces prevalent within the Japanese cultural context though the latter is decreasing with the rise of ASD as a prevalent disorder [52,53]. Likewise, even for analogous syndromes such as depression, cultures differ in symptomology [54]. Much like with gender, there may be more and less acceptable norms and therefore more or less possible manifestations of psychopathological symptoms given the cultural context. More research is needed to address whether analogous prevalence in symptomology is the result of analogous social and cultural forces. Similarly, psychotherapists from the same cultural context will not only share and have insight and training into their clients' socio-environmental forces, moreso than a therapist from a different culture. We acknowledge this could engender culturally-specific skills in recognizing, interpreting and relaying the meaning of certain expressions in psychotherapy.

5. Conclusions

This research was inspired by observations of sand play and play therapy in Japanese children, which seemed to show that boys tend to develop a sense of self through fighting against an 'other', or in war in their own world, while girls tend to build closed spaces and focus on interiority. Based on this, we wanted to explore whether such patterns in psychotherapy are related to problems in specific disorders. From this, we argue that lack of other can lead to a chaotic fighting and an absence of psychological structure (ASD), fighting against the other is associated with excessive aggression (tic disorder), enclosure is associated with inhibiting expressions (selective mutism), and internal conflict (trichotillomania). In this sense, we suggest that more differentiation and control of aggression in case of boys and discharge of energy toward outside in case of girls are therapeutically important.

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