Loneliness in Children With High Functioning Pervasive Developmental Disorders

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Although children with high-functioning pervasive developmental disorders (HFPDD) may notice that they are different from other children, they may not sufficiently understand what is specifically different about them, which may increase their feeling of loneliness. The present article examined developmental and qualitative differences in feelings of loneliness of children with HFPDD and children who are typically developed by investigating the relationship between competence and loneliness. Children with HFPDD (n=45) and children who are typically developed (n=281) who were at various stages of development completed a loneliness and competence scale. The results suggested that after the higher grades of elementary school, the children with HFPDD were lonelier than the children who are typically developed. The loneliness and competence scores were independent of each other among the children with HFPDD, whereas those scores were significantly negatively correlated in the children who are typically developed. Loneliness in children with HFPDD may be unlike that experienced by children who are typically developed; their loneliness may not be related to psychological conditions, such as appreciating interactions with friends, but rather directly related to physical conditions, such as a lower number of acquaintances. Therefore, both subjective and objective aspects of loneliness must be considered.

Key Words: loneliness, theory of mind, competence, child development; children with high functioning pervasive developmental disorders (HFPDD)

Introduction

Children with high-functioning pervasive developmental disorders (HFPDD) may suffer from deficits of theory of mind (ToM); that is, they may lack unde-
standing of their own mind and that of others (Baron-Cohen, Leslie, & Frith, 1985). Because children with HFPDD are less able to interpret the minds of others, their social interactions are inhibited, thus facilitating behavior that tends to deviate from the norm.

Children with HFPDD may exhibit behavior that differs slightly from that of others. A key issue is the degree to which these children understand this behavior as well as the resulting loneliness. Some hints can be obtained via autobiographies published over the past 20 years by adults with HFPDD. These works do not indicate that as children they were uninterested in others, only that they were relatively unable to interpret what others were thinking.

Although children with HFPDD may be able to understand how they differ from others, this understanding still creates feelings of intense discomfort (e.g., Moriguchi, 2002). However, very few studies have explored this discomfort empirically. Research by Bauminger and Kasari (2000) deserves consideration. It compared indices of loneliness and friendship between children with HFPDD and children who were typically developed who were between the chronological ages of 7 and 11, and demonstrated that the children with HFPDD felt lonelier than the children who were typically developed. A significant negative correlation between scores on loneliness and friendship scales was observed among the children who were typically developed but not among those with HFPDD, suggesting the possibility that the quality of loneliness differed between the two groups.

Other issues related to children with HFPDD also require further investigation. One is the change in loneliness with development. Children with HFPDD pass false-belief tasks, a parameter of theory of mind, after a verbal mental age of 9 (Happé, 1995). Beyond this period, they are said to be aware of the feelings and intentions of others. Since children over the age of 9 are expected to realize that there are slight differences between themselves and others in terms of how they feel and comprehend, knowing that they lack this capacity may increase feelings of loneliness in children with HFPDD. Therefore, the primary purpose of the present study was to examine developmental differences in feelings of loneliness between children with HFPDD younger than 9 or 10 years and those older than that.

Another key issue requiring further investigation is the association/relationship between the loneliness and competence scales. Competence, which specifically refers to perceived competence, is considered a measure of self-esteem. According to Harter (1982), competence comprises four domains: a social domain, a cognitive domain, a physical domain, and a general self-worth domain. Assuming normal development, a strong sense of loneliness may be linked to low self-esteem. If a qualitative difference in loneliness between children with HFPDD and typically developed children is assumed (Bauminger & Kasari, 2000), however, a significant relationship between the two will most likely not be observed in children with HFPDD. Thus, a secondary purpose of this
study is to examine the quality of loneliness felt by children with HFPDD by investigating the relationship between their scores on the competence scale and loneliness.

Method

Participants

The HFPDD group included children who had been diagnosed with HFPDD according to established diagnostic criteria (DSM-IV-TR, American Psychiatric Association, 2000) by psychiatrists who were members of the Asperger Society Japan, and who had been judged to have a Verbal Comprehension Index Score above 70 on the Wechsler Intelligence Scale for Children III (WISC-III; Japanese WISC-III Publication Committee, 1998). The parents of the children were provided with details of the study, and their informed consent was obtained. The Research Ethics Committee of the Asperger Society Japan approved the testing.

The group of children with HFPDD was comprised of 15 children in the lower grades of elementary school (grades 1–3, mean age [range]: 96.3 months [77–111]), 16 children in the higher grades of elementary school (grades 4–6, mean age [range]: 127.9 months [116–145]), and 14 junior high school children (grades 7–9, mean age [range]: 169.9 months [150–191]).

To form the typical development group, one class in each grade of elementary school A and junior high school B in prefecture C was asked to participate in the testing. From those schools, 89 children in the lower grades of elementary school (grades 1–3), 87 children in the higher grades of elementary school (grades 4–6), and 105 junior high school children (grades 7–9) participated.

Questionnaires

Loneliness scale. The present study used a questionnaire derived by Maeda (1995) from the Loneliness and Social Dissatisfaction Scale (Asher & Wheeler, 1985). The questionnaire was comprised of 11 questions, such as “Is it difficult for you to make close friends?” and “Do you feel alone?” The same questions were used for the junior high school students in relation to junior high school. A trichotomous method was used in which the participants were asked to respond to the questions with either “Yes,” “Cannot say,” or “No.” Responses were assigned scores of 3, 2, or 1 respectively, resulting in a total score range of from 11 to 33 points. The higher the score, the higher the reported sense of loneliness.

Competence scale. The present study used a questionnaire derived by Sakurai (1983) from the Perceived Competence Scale for Children (Harter, 1982). Perceived competence was measured across four domains: a cognitive domain, a physical domain, a social domain, and a general self-worth domain. The questionnaire consisted of seven questions per domain, or a total of 28 questions. For example, one of the questions in the social domain asks the participants to select between the statements “I have many friends” and “I do not have any friends,”
and then asks them to select whether their response “Somewhat represents” or “Best represents” themselves. The responses were assigned scores of 4, 3, 2, and 1, respectively. Table 1 presents a sample question with the corresponding scoring. Total scores in the social domain ranged of from 7 to 28 points. The higher the number of points, the higher the level of competence.

Statistical analysis was performed using Version 12.0 of SPSS.

Procedure
The participants were asked to fill out the two questionnaires described above. When the children with HFPDD were given the questionnaires, another individual sat with each of them, received, and read the questionnaire aloud to the child. The child then entered the responses. For the children who were typically developed, a teacher in charge of their grade provided the questionnaires, and the children filled in their answers. It took a total of 15 min to complete the two questionnaires.

Results

Loneliness Scale
Scores on the loneliness scale were entered into a two-way analysis of variance (ANOVA), with the factors being Group (HFPDD Group, Typical Development Group) × School Grade (children in the lower grades of elementary school, children the higher grades of elementary school, children in junior high school). Significant differences were observed in the main effect of group ($F(1, 302)=36.324, p<.01$), as well as the interaction between group and school grade ($F(2, 302)=3.488, p<.05$).

Due to the significant interaction, the simple main effect at each respective significance level was analyzed. The analysis indicated a significant difference at the 5% level (with Bonferroni correction) between children with HFPDD and children who were typically developed in the higher grades of elementary school and in junior high school, but not in the lower elementary school grades. Moreover, data for neither of the groups (children with HFPDD or with typical development) showed significant differences between grade levels (Fig. 1).

Significantly higher loneliness scores were obtained by the group of children with HFPDD than in the typical development group, regardless of school grade. Although the difference between the children with HFPDD and the children who were typically developed was not significant in the lower grades of elemen-
tary school, the loneliness scores of the children with HFPDD were significantly higher than those of the children with typical development in the higher grades of elementary school as well as in junior high school.

**Competence Scale**

Scores on the competence scale were calculated, and those for each domain were entered into a two-way ANOVA, with the factors being Group (HFPDD Group, Typical Developmental Group) × School Grade (children in the lower grades of elementary school, children in the higher grades of elementary school, children in junior high school).

With regard to the social domain, Fig. 2 shows the significant differences observed in the main effect of school grade ($F(2, 302)=23.122, p<.01$), as well as the interaction between group and school grade ($F(2, 302)=3.216, p<.05$).

The ensuing analysis of the simple main effect at each respective significance level indicated a significant difference at the 5% level (with Bonferroni correction) between the children with HFPDD and the children with typical development only in the higher grades of elementary school. In terms of the school grade factor, significant differences in competence were observed at the 5% level (with Bonferroni correction) in the children with typical development between the lower and higher grades of elementary school, the lower grades in elementary school and junior high school, and the higher grades in elementary school and junior high school. Significant differences in competence (at the 5% level with Bonferroni correction) were also observed among the children with HFPDD between the lower and higher grades in elementary school, as well as between the lower grades in elementary school and junior high school.

![FIG. 1](image-url) Average Scores on the Loneliness Scale of the Children With HFPDD and the Children Who Were Typically Developed in the Lower (Grades 1–3) and Higher Grades (Grades 4–6) of Elementary School, and Grades 7–9 of Junior High School
These results indicate that, in general, competence in the social domain declines as school grade progresses, regardless of whether children have HFPDD. Only among the participants in the higher grades of elementary school was competence in the social domain significantly lower in the children with HFPDD than in the children with typical development.

In the cognitive domain (Fig. 3), only the main effect of school grade was significant ($F(2, 302) = 6.330, p < .005$). The analysis of multiple comparisons indicated a significant difference at the 5% level (with Bonferroni correction) in competence between the lower grades in elementary school and junior high school and between the lower grades in elementary school and the higher grades.

**FIG. 2** Average Scores for Competence in the Social Domain of the Children With HFPDD and the Children Who Were Typically Developed

**FIG. 3** Average Scores for Competence in the Cognitive Domain of the Children With HFPDD and the Children Who Were Typically Developed
in elementary school. The cognitive competence of the lower grades in elementary school was higher than in the higher grades in elementary school and junior high school.

In the physical domain (Fig. 4), only the main effect of school grade was significant \((F(2, 302) = 10.822, p < .005)\). The analysis of multiple comparisons indicated a significant difference at the 5% level (with Bonferroni correction) between the lower grades in elementary school and junior high school and between the higher grades in elementary school and junior high school. The physical competence of the lower grades in elementary school and junior high school was higher than in the higher grades in elementary school.

In the general self-worth domain (Fig. 5), only the main effect of school grade was significant \((F(2, 302) = 10.740, p < .001)\). The analysis of multiple comparisons indicated a significant difference at the 5% level (with Bonferroni correction) between the lower grades in elementary school and junior high school and between the lower grades in elementary school and higher grades in elementary school. The general self-worth competence of the lower grades in elementary school was higher than in the higher grades in elementary school or junior high school.

Therefore, in the cognitive, physical, and general self-worth domains, no significant difference was found between the HFPDD Group and the typical development group in association with grade in school. As the children grew up, their competence tended to decrease regardless of the presence or absence of HFPDD.

**Association between Loneliness and Competence**

A Pearson correlation factor was calculated (Table 2) between the points on

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**FIG. 4** Average Scores for Competence in the Physical Domain of the Children With HFPDD and the Children Who Were Typically Developed
the loneliness scale and on the competence scale in each domain for the group of children with HFPDD and the group of children with typical development.

Among the children with typical development, significant negative correlations were observed for the social domain \(r = -.414\), cognitive domain \(r = -.370\), physical domain \(r = -.290\), and general self-worth domain \(r = -.352\) in the lower grades of elementary school. Similarly, significant negative correlations were observed for the social domain \(r = -.676\) and for the

![Graph](image)

**FIG. 5** Average Scores for Competence in the General Self-Worth Domain of the Children With HFPDD and the Children Who Were Typically Developed
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general self-worth domain (r = -.446) in the higher grades of elementary school. Significant negative correlations were also observed for the social domain (r = -.208), physical domain (r = -.585), and general self-worth domain (r = -.416) in junior high school.

In addition, a significant negative correlation (r = -.602) for the data from the children with HFPDD was found only in the general self-worth domain among the children who were in the lower grades of elementary school.

Discussion

Developmental Changes in Loneliness

The present study revealed significantly greater feelings of loneliness among children with HFPDD than among their counterparts who are typically developed, supporting the findings of Bauminger and Kasari (2000). In the present study, the difference was not significant among participants in the lower grades of elementary school but was evident in higher grades of elementary school and in junior high school. In essence, the present findings suggest that feelings of loneliness in children with HFPDD are not high compared with those of children who are typically developed over their lifetime; rather, those feelings change throughout their lives according to the development stage.

Children with HFPDD and children who are typically developed may show different developmental changes. Children who are typically developed acquire second-order theory of mind around 9–10 years of age. The understanding of second-order theory of mind is indispensable for developing an understanding of third-order theory of mind and the generalized mind, as well as for comprehending complex interpersonal relationships (Koyasu, 2000).

Children with HFPDD usually acquire primary theory of mind by the age of 9, which corresponds to the higher grades of elementary school. However, unlike children who are typically developed, they have not yet, at that age, acquired second-order theory of mind. Thus, even when children with HFPDD in higher grades of the elementary school through junior high school notice that they are different from others, they sometimes do not sufficiently understand what specifically is different and why they differ. As a result, rather than developing feelings of self-acceptance, feelings such as severe feelings of self-denial may emerge, including characteristics of self that differ from those of their friends (Beppu, 2007).

However, because the present study did not evaluate theory of mind tasks, the above conjecture is currently only a hypothesis. In the future, we will evaluate theory of mind stage progression as directly related to loneliness.

Relation Between Loneliness and Competence

An examination of the relation between loneliness and competence revealed a significant negative relation among children who are typically
developed, regardless of age. But, in the data from the children with HFPDD, a significant negative correlation was found only in the general self-worth domain among those children who were in the lower grades of elementary school. On the basis of these results, the differences in the loneliness of children with HFPDD and children who are typically developed will be discussed in what follows.

Ochiai (1999) analyzed data pertaining to loneliness in children from higher grades of elementary school through an elderly age and classified the determinants of loneliness into two groups: psychological conditions relating to affection, and physical conditions relating to physical isolation. The psychological conditions were divided into three dimensions: relationships with others; the self, such as the significance of existence and self-worth; and time perspectives. On the competence scale, social domain questions such as “I think (don’t think) that I’m a very important member of my class” matches the dimension of relationships with others, according to Ochiai (1999). General self-worth domain questions such as “I think that I’m doing just fine now/I hope to live life differently” match the dimension of the self. Therefore, it was predicted that a negative correlation would be found between loneliness and the social domain, as well as the general self-worth domain, among children who were typically developed. The results of the present study supported this hypothesis.

However, this relation was not observed among the children with HFPDD: loneliness and competence (in the social and general self-worth domains) were shown to be independent of each other among these children. One interpretation is that the determinants of loneliness among the children with HFPDD are not psychological conditions, such as the dimensions of others and self.

Collateral evidence comes from the research of Bauminger and Kasari (2000), who analyzed the structure of loneliness. According to their findings, loneliness is comprised of two aspects: social-cognitive loneliness, in which an individual feels that he/she has no friends, and affective loneliness, in which an individual feels lonely when alone. Bauminger and Kasari (2000) indicated that children with HFPDD could understand social-cognitive loneliness but not affective loneliness. We understand social-cognitive loneliness as a physical condition, and affective loneliness as a psychological condition (Ochiai, 1999). This suggests that, although loneliness among children who are typically developed comprises these two aspects, it is possible that children with HFPDD only perceive loneliness in terms of the social-cognitive aspect.

From the viewpoint of the theory of mind, in order to know themselves as seen by others and to promote self-understanding through others, it is important for individuals to understand the second-order theory of mind. For example, a belief such as “It seems that ‘A’ thinks that I dislike ‘A’” is not an immediate, primary belief (such as “It seems that ‘A’ dislikes me”). It is a judgment based on a false belief of “A” about the discord of the interpersonal relationship with “A”. By this understanding of second-order beliefs, self-understanding through others
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is improved. Thus, loneliness in children with HFPDD is not like the loneliness of typically developed children. This implies the possibility that loneliness in children with HFPDD is not related to a psychological condition, such as appreciating the quality of interactions with friends and then missing such interactions, but is rather due to a physical condition, such as the number of acquaintances one has or the frequency of contact with them.

At the time of early adolescence, some children with HFPDD complain of high loneliness (i.e., “I have no friends”), which may sometimes lead to secondary problems such as truancy and depression. Even in such cases, these children may objectively have friends and enjoy relationships with others that do not appear to be especially negative (Beppu, 2007).

Bauminger, Shulman, and Agam (2003) analyzed the relation between actual peer interactions and loneliness. Although their analysis indicated that the more positive the peer interactions were among children who were typically developed, the less these children felt loneliness, this relationship was not observed among children with HFPDD. Therefore, unlike children who were typically developed, children with HFPDD do not demonstrate a relationship between their ability to interact with peers and their relative sense of loneliness. When the loneliness of physical conditions is being investigated, it is important to capture both subjective and objective aspects, because a gap may exist between objective aspects, such as the number of friends and the frequency of contact with them, and subjective aspects, as seen by children with HFPDD.

References

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—Received June 8, 2010; Accepted June 18, 2011—