

# Loneliness and Social Support in Adolescent Boys with Attention Deficit Hyperactivity Disorder in a Special Education Setting

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**Abstract** Social difficulties have been suggested to exacerbate the risk of loneliness. The social difficulties in social relations often reported for adolescents with attention deficit hyperactivity disorder (ADHD) could be a risk for increased loneliness in adolescents with ADHD. However, current studies of the risk of loneliness in persons with ADHD are limited and their results are mixed. Especially the adolescent age group is poorly investigated and has not been studied as a separate group. In this study we investigate the experience of loneliness and social support in adolescents with attention deficit hyperactivity disorder (ADHD) in a special educational setting. Twenty-five adolescent boys with clinically diagnosed ADHD filled out self-report measures of loneliness, difficulties in making friends, and social support. The boys with ADHD were compared with 199 adolescent boys from regular schools. No difference in the degree of loneliness was found even if more adolescents with ADHD reported difficulties in making friends. These difficulties were related to loneliness in the control group, but not in the ADHD group. Social support from classmates and peers reduced the degree of loneliness in the ADHD group. Adolescent boys with ADHD in a special educational setting do not seem to be at a higher risk of loneliness in adolescence.

**Keywords** ADHD · Adolescents · Loneliness · Social support · Special education

## Introduction

Attention deficit hyperactivity disorder (ADHD) is characterized by pervasive and impairing symptoms of attention, hyperactivity, and impulsivity before the age of 12 (American Psychiatric Association 2013). Beyond the core symptoms difficulties in social relations in children with ADHD are well documented and seem to be pervasive and to persist into adulthood (Wehmeier et al. 2010). The core symptoms may disrupt the natural flow in the exchange and challenge cooperation, sharing and turn taking (Wehmeier et al. 2010). Inattention and hyperactivity may hinder effective encoding of emotional and contextual cues to understand the social interaction and thus increase the risk of misunderstandings and conflict. Difficulties with inhibition, regulating frustration and anger may further increase the risk of negative social experiences. Moreover, it has been found that peers often reject children and adolescents with ADHD and rate them lower on social preference (Hoza 2007). The negative peer response may increase the feeling of being misunderstood or treated badly and may increase the negative behavior of the child with ADHD. Over time the negative response from peers may build into more stable reputations making it difficult for the child or adolescent with ADHD to change the interaction (Hoza 2007). It is highly relevant to understand the potential consequences of the social difficulties in ADHD.

Loneliness is commonly viewed as a subjective, unpleasant, and distressing experience resulting from deficiencies in a person's social relationships (Peplau and Perlman 1982). It affects the individual's social, affective, and cognitive functioning, and it is associated with a range of mental health problems, including depression, anxiety, and suicidal ideation (Cacioppo et al. 2006; Heinrich and Gullone 2006; Lasgaard et al. 2011). The prevalence of

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loneliness varies across age groups, but it is generally regarded as being highly prevalent in adolescence and old age (Victor and Yang 2011). Studies of children and adolescents with learning disabilities (e.g., Margalit and Al-Yagon 2002) and autism spectrum disorder (e.g., Lasgaard et al. 2010) suggest that the risk of loneliness is exacerbated by mental health disorders marked by social difficulties in adolescence. Such difficulties may limit the number and quality of social relations, and this may increase the risk of feeling lonely, which may, in turn, reduce the individual's propensity to seek social support.

Social support is a multidimensional construct. However, perceived support, defined as the perception of the support assumed to be available if needed, has been found to be the best predictor of wellbeing (Chu et al. 2010). According to a meta-analysis (Mahon et al. 2006), social support in the general population may protect against loneliness during adolescence. Perceived social support may be available from different sources such as parents, teachers, and peers; and both the sources of social support and the cumulative nature of such support affect adolescent social adjustment and wellbeing (Chu et al. 2010; Rueger et al. 2010). Rueger et al. (2010) investigated the effect of perceived social support from multiple sources on adjustment and found that whereas boys compared to girls reported a lower degree of perceived social support from all sources except parents, support from classmates was a unique predictor of adjustment for boys, but not for girls.

Studies of the risk of loneliness in persons with ADHD are limited and their results are mixed. Langher et al. (2009) found that children (age 6 to 13) clinically diagnosed with ADHD ( $n = 31$ ) reported a higher degree of loneliness than age- and gender-matched children without special needs ( $n = 31$ ). Moreover, the ADHD group scored at the same level of loneliness as a matched group with other special needs ( $n = 31$ ). Similarly, Al-Yagon (2009) found a higher degree of loneliness in a group of children (age 8 to 12) with clinically diagnosed ADHD and comorbid learning difficulties (LD;  $n = 59$ ) than in age- and gender-matched children without ADHD and LD ( $n = 59$ ). In contrast, Heiman (2005) compared a group with clinically diagnosed ADHD ( $n = 39$ ; age 7.5 to 12.2) with children matched on school level ( $n = 17$ ; age 7.0–10.8) and found that the children with ADHD did not express more intense feelings of loneliness than children without ADHD. Nevertheless, parents and teachers of students with ADHD perceived their children as lonelier than the parents and teachers of the children in the control group. In line with Heiman (2005), Houghton et al. (2015) found no difference in loneliness for children and adolescents (age 9 to 18 year) with clinically diagnosed ADHD ( $n = 84$ ) compared with age- and gender-matched controls ( $n = 84$ ).

The studies by Heiman (2005), Langher et al. (2009) and Al-Yagon (2009) all used the Children's Loneliness and Social Dissatisfaction Rating Scale (CLS; Asher et al. 1984; Cassidy and Asher 1992), whereas Houghton et al. (2015) used the Perth A-Loneness scale (PALs; Houghton et al. 2015). These measures are all based on self-reports. The study by Heiman (2005) was the only study to include parent and teacher ratings of loneliness using adapted versions of CLS.

Although social difficulties associated with ADHD have been argued to increase the risk of loneliness in persons with ADHD (Al-Yagon 2009; Heiman 2005; Houghton et al. 2015; Langher et al. 2009), only Heiman (2005) addressed aspects related to social difficulties. Heiman found that compared with the control group, individuals in the ADHD group more often described their best friend as a companion for fun and less often as an emotionally supportive friend. Also, the children with ADHD most frequently met their friends at school (70 vs. 45% for the control group), while only a small percentage of the children with ADHD met their friends at home (6 vs. 30% for the control group; Heiman 2005).

Moreover, the age of the included participants ranges from 6 to 18 years and span periods associated with different developmental characteristics, social settings, and societal expectations (Laursen and Hartl 2013). These differences may distort or mask developmental differences in loneliness in the investigated children and adolescents with ADHD and this could partly explain the mixed results. Especially the adolescent age group is poorly investigated and has not been studied as a separate group; the recent study by Houghton et al. (2015) included both pre-adolescents and adolescents, but did not examine the association between age and loneliness.

The existing literature on perceived social support in children and adolescents with ADHD is limited but so far studies indicate lower levels of perceived social support in ADHD (Mastoras et al. 2015) or in relation to ADHD characteristics (Demaray and Elliot 2001). In a study by Mastoras et al. (2015) the perception of social support in relation to emotional well being for children with ADHD were compared to normative data. The study found that the children with ADHD reported lower perceptions of social support from all sources except classmates and that the level of social support was unrelated to symptom severity but was positively associated with measures of self-concept. The link between perceived social support and loneliness in ADHD has to our knowledge not been investigated. However, in line with the general literature on social support, it has been suggested that supportive friends (Houghton et al. 2015) and parental resources in managing behavior (Langher et al. 2009) are protective factors with regard to loneliness in persons with ADHD. It has also been

suggested that inclusion in mainstream education is a protective factor; however, so far mainstream education is the only type of school setting in which loneliness in ADHD have been investigated (Al-Yagon 2009, Heiman 2005, Langher et al. 2009).

This paper presents an initial study of loneliness in adolescents with ADHD in a special educational setting. Furthermore, the study focuses on a small age span in adolescence (i.e., early adolescence). We had no a priori hypotheses, but based on previous research and the suggested mechanisms of loneliness, the degree of loneliness was expected to be elevated in the adolescents with ADHD from the special educational setting compared with the control group. Finally, we investigated the relationship between loneliness and perceived social support from different sources and the experience of difficulties making friends, which to our knowledge has not previously been investigated in this group. It was hypothesized that social support protects against loneliness and that difficulties making friends increases the risk of loneliness.

## Method

### Participants

The sample was recruited at two special education schools in the Central Denmark Region, Denmark, which accept children and adolescents with severe ADHD or autism spectrum disorder (ASD) for whom adequate educational support cannot be provided in regular classrooms. The organization at the two schools is comparable with a basic classroom structure of five to seven students with four full-time staff members. The classroom is constructed so it is possible to provide an optimal physical structure for the students and to allow a flexible mix between secluded private workspace, one-to-one teaching, and group teaching. The days at the school are typically from 8 to 16 and allow the staff to integrate social and leisure time activities during the day as well as time for social training. The schools only caters children and adolescents with either an ASD or and ADHD diagnosis and with intellectual ability within or above the range of normal intellectual functioning ( $IQ > 70$ ). In addition to the formal diagnosis from the regional child and adolescent psychiatry the individual needs of the child or adolescent are evaluated at the municipality, by a team of psychologists and consultants and the child or adolescent will only be admitted at the school if recommended by the team at the municipality.

To participate in the study, the adolescents had to have a formal clinical diagnosis meeting the ICD-10 criteria for F90 Hyperkinetic disorder (World Health Organization 1994) and to be without intellectual disability. A total of 25

adolescent boys aged 13 to 16 years (grade 7 to 9) met these criteria; 14 adolescents were diagnosed with F90.0 (Hyperkinetic disorder, disturbance of activity and attention), 5 were diagnosed with F90.1 (Hyperkinetic conduct disorder), and 6 were diagnosed with F90.8 (Other hyperkinetic disorder). ADHD is used as a common term in this paper. In Denmark, the diagnostic evaluation is undertaken at regional hospitals according to the ICD-10 criteria (World Health Organization 1994). Compared to ADHD (as specified in DSM 5), a diagnosis of hyperkinetic disorder (F90.0) requires the child to meet the criteria of all core symptoms: inattention, hyperactivity and impulsivity. For the diagnosis of hyperkinetic conduct disorder (F90.1) the criteria of hyperkinetic disorder (F90.0) as well as the criteria of conduct disorder (F91.0) needs to be met. The diagnosis of other hyperkinetic disorder (F90.8) may be used in case not all criteria for hyperkinetic disorder (F90.0) are met in full. This may be the case for children whom in DSM-5 would be described as either the inattentive or hyperactive-impulsive presentation of ADHD. Children with a comorbid autism spectrum diagnosis were excluded from this study while other types of comorbidity were accepted. The diagnostic procedure in Denmark includes a broad evaluation that build on the contributions from psychiatrists, psychologists, nurses, and teachers. The evaluation typically includes observations, physical and psychological assessment, including assessment of intellectual ability, and interviews including the use of standardized diagnostic instruments such as the Schedule for Affective Disorders and Schizophrenia for school-aged children (K-SADS; Ambrosini 2000) and the Development and Well-Being Assessment (DAWBA; Goodman et al. 2000).

The ADHD group was compared with 199 adolescent boys aged 13–16 years from grade 8 classes in regular schools. The controls participated in a Danish national probability study on loneliness. The procedure of the study is described in Lasgaard (2007).

### Procedure

The design of the study and the format of the questionnaire were adapted to the adolescents with ADHDs' cognitive characteristics (Eriksen 2005, Lasgaard et al. 2010). To make the study material more accessible to children with attention difficulties each questionnaire was presented as a small booklet with only two to five items printed on one page. Colors were used to help the student distinguish between the response-categories. The type of structure used was identical to strategies used at the attended schools. Prior to the data collection, staff and parents were informed in writing about the purpose and the procedures of data collection and confidentiality. Upon parental consent, the school staff provided the researchers with information on the adolescents' normal support level, with regard to the

reading ability of the child. The adolescents then received an invitation to participate. The invitation described the procedures securing confidentiality, the time, place, and purpose of the study; and it included a picture of the person administering the data collection. If the adolescent had a difficult day, the data collection was rescheduled. Data were collected during the school day in a quiet room on the school. The administrator introduced the questionnaire to each adolescent. The administrator offered to read out the questions or to explain any questions the adolescents might have to the study or when filling out the questionnaire; but the adolescents were seated so that their response was not visible to the administrator. Seven adolescents had the questions read out to them (primarily due to reading difficulties). There was no difference in loneliness scores for the adolescents having the questions read out compared with the other adolescents (ANOVA, *ns*).

**Measures**

The degree of loneliness was assessed using a Danish version of the UCLA Loneliness Scale (Lasgaard 2007; Russel 1996). The scale consists of 20 items rated on a 4-point Likert scale according to the frequency of subjective feelings of loneliness (11 positive and 9 negative) ranging from never (1) to always (4). Higher scores reflect greater loneliness. In the present study, the scale demonstrated good internal consistency for the sample of adolescent boys with ADHD ( $\alpha = .84$ ) and for the sample of adolescent boys from regular schools ( $\alpha = .91$ ).

Social support was measured using a Danish version of the Social Support Scale for Children (SSSC; Harter 1985). The scale consists of four subscales that assess social support and positive regard from parents, a teacher, classmates, and a close friend, respectively. Each scale contains six items rated on a scale from 1 to 4 with higher scores representing a higher degree of experienced social support. The scale was not included in the national probability study of students from regular schools. The scale demonstrated good internal consistency (parents  $\alpha = .87$ ; classmates  $\alpha = .78$ ; teacher  $\alpha = .79$ ; friend  $\alpha = .93$ ). Furthermore, the adolescents were asked if they experienced difficulties in making friends, and their answers were rated on a 4-point Likert scale that ranged from strongly disagree (1) to strongly agree (4). This item was included to explore one aspect of social relations that has frequently been described in relation to persons with ADHD and which could be related to loneliness in ADHD.

**Data Analyses**

The reported demographics of the two samples (ADHD and control) as summarized in Table 1 were compared using independent samples t-test. A significant difference in

variance was found in relation to age, which reflected the fact that 82% of the grade 8 students from regular schools were 14 years, whereas most of the students with ADHD were 14, 15 or 16 years old (28, 32, and 24%, respectively). No differences in living arrangements were observed.

To examine group differences on the UCLA score, univariate ANOVAs were conducted with group as the independent variable and loneliness score as the dependent variable. Tukey’s B posthoc was used to examine differences in loneliness across age (13, 14 and 15+ years old), and different living arrangements in either sample and across subtypes of diagnosis in the ADHD group. The association between loneliness and multiple sources of perceived social support was examined by calculating the Pearson correlation coefficient (ADHD group only). To examine group differences (ADHD and control) in difficulties in making friends (agree or strongly agree) logistic regression was conducted. The association was evaluated using odds ratios (ORs) with 95% confidence intervals (CIs). Finally, to examine group differences on the UCLA score, univariate ANOVAs were conducted with difficulties in making friends as the independent variable and loneliness score as the dependent variable in either sample (i.e., ADHD and control).

**Results**

No group difference was found in degree of loneliness between adolescents with ADHD and adolescents from regular schools (see Table 1). Moreover, the subtype of

**Table 1** Sample characteristics

Variable	ADHD ( <i>N</i> = 25)	Controls ( <i>N</i> = 199)
<b>Sociodemographic</b>		
Age, mean (SD)	14.6* (1.04)	14.1 (.43)
Grade	7–9	8
Two-parent family/single parent, <i>n</i> (%)	23 (92)	197 (99)
<b>Psychological</b>		
UCLA, mean (SD)	37.6 (7.94)	37.69 (10.23)
SSSC parents, mean (SD)	19.17 (4.14)	
SSSC classmates, mean (SD)	19.29 (3.28)	
SSSC teacher, mean (SD)	18.96 (3.42)	
SSSC close friend, mean (SD)	20.92 (3.90)	
Often/always difficulties in making friends, <i>n</i> (%)	11** (44)	30 (15)

UCLA UCLA Loneliness Scale, SSSC Social Support Scale for Children, SD standard deviation

\*  $p < .05$ , \*\*  $p < .01$

**Table 2** Correlation matrix for degree of loneliness and types of social support

Scale	SSSC parents	SSSC teacher	SSSC classmates	SSSC close friends
UCLA	-.199	-.261	-.527**	-.545**
SSSC parents		.225	.100	.111
SSSC teacher			.327	.410*
SSSC classmates				.560**

UCLA UCLA Loneliness Scale, SSSC Social Support Scale for Children

\*  $p < .05$ , \*\*  $p < .01$

ADHD diagnosis was not associated with loneliness. Loneliness scores were not associated with age or different living arrangements in either sample. Loneliness in adolescents with ADHD correlated negatively with perceived social support from classmates and a close friend (see Table 2). However, perceived social support from parents or teachers was not significantly associated with loneliness.

Self-report of difficulties in making friends was strongly associated with ADHD ( $OR: 4.35 [CI: 1.80-10.48]$ ,  $p = .001$ ). However, difficulties in making friends was not associated with loneliness in adolescent boys with ADHD; yet, the association proved highly significant in adolescent boys from regular schools ( $F(1194) = 46.0$ ,  $p < .0001$ ).

## Discussion

The results of the present study indicate that adolescent boys with ADHD do not experience higher levels of loneliness than adolescent boys from regular schools. This is in line with both a recent study by Houghton et al. (2015) including preadolescent and adolescent school children (age 9 to 18 years) and a study by Heiman (2005) including preadolescent school children (age 7 to 12 years); both these studies found comparable levels of loneliness in the groups with ADHD and the groups without ADHD.

In the present study, adolescents with ADHD in special school settings reported difficulties in making friends more often than adolescent boys from regular schools. This finding supports the established notion of social difficulties in adolescents with ADHD. However, the reported social difficulties were not linked to the degree of loneliness, which is in line with the study by Diamantopoulou et al. (2005) who showed a relation between ADHD symptoms and negative peer relations, but no relation between ADHD symptoms and loneliness. The results call for more detailed studies of the potential mechanisms of loneliness in relation to ADHD. Other variables may moderate the risks of loneliness for adolescents with ADHD. The higher rate of loneliness in adolescence has been attributed to developmental changes in social perspective-taking, companions, autonomy, and cognitive and physical maturation and the associated changes in social expectations and needs

(Laursen and Hartl 2013). ADHD is generally viewed as a developmental disorder and ADHD symptoms and the associated cognitive, social and emotional difficulties adversely affect the transition into adolescence (Wehmeier et al. 2010). Similarly, the awareness of the ADHD difficulties may lead to a slower rate of change in societal demands on the adolescent and to higher rates of support from teachers and parents trying to meet the adolescent's specific needs in order to more efficiently scaffold the development and if necessary to compensate for the current deficiencies, for instance through external structure. It may be speculated that the loneliness expressed by the ADHD group and the adolescents from regular schools may reflect different developmental mechanisms and that the risk typically associated with adolescence may not fully affect the adolescents with ADHD until later in development. Following this suggestion, higher rates of loneliness would be expected for individuals with ADHD in adulthood. While studies of loneliness in adults with ADHD are still limited, Philipsen et al. (2009) and Michielsen et al. (2013) do find increased levels of loneliness in adults and older adults with ADHD, respectively.

Social support in relation to loneliness has not previously been investigated in adolescents with ADHD. In the present study, support from classmates and a close friend correlated negatively with loneliness, while no relation was found between loneliness and support from parents and teachers. Hence, the present study to some extent confirmed the more general suggestion that perceived social support is a protective factor (Mahon et al. 2006) and that the perceived social support from peers may be of particular importance for adolescent boys (Rueger et al. 2010). While perception of social support has been found to be a stronger predictor of well-being compared to more objective measures of social support (Chu et al. 2010), there may be a reason to investigate this more closely for children and adolescents with ADHD. It is possible that the perceptions of social support may be influenced by the difficulties inherent in the disorder; it is also possible that the actual availability of social support may be of greater importance for the children and adolescents with ADHD compared to children and adolescents without ADHD, also when this support is not necessarily perceived and reported by the child or adolescent.

The relevance of the school settings also needs to be considered as the present study included adolescents from special educational schools only. In such a setting, the normative climate is likely more accepting of the difficulties typically associated with ADHD, and this acceptance would be displayed both by the professionals and the parent group in general. Also, the normative acceptance by peers would in general be higher given the time, resources, and skills of the professional staff working with these aspects. The peers in this setting may hence provide a more realistic standard of self-reference for the students with ADHD. In Denmark, children and adolescents with ADHD rarely begin in a special educational school; often more inclusive options are tried out first. These options range from regular schooling to support at the class. Most of the adolescents in a special educational school will have prior experience of an inclusive school setting that was not optimal; and they will therefore most likely have received some degree of negative feedback from teachers or peers. It may therefore be speculated that a great part of the investigated adolescents perceived the special educational setting as a change for the better. A special educational setting may also provide social relations that are more accessible than traditional educational settings. Although the relations available in a special educational setting may be more limited in terms of number and variation, the small group sizes and the high degree of structure in both class and during break time most likely increase the students' sense of inclusion in formal and informal social interactions. The accessibility of social relations in school is even more essential if children and adolescents with ADHD are more exclusively reliant on the school setting for meeting with friends as previously suggested (Heiman 2005).

### Limitations

Following limitations should be mentioned. The sample size is small and the national probability sample does not include information on clinical diagnosis. The latter would tend to minimize any potential differences in loneliness. Furthermore, the small sample size does not allow analysis of subtypes and we had only limited knowledge of individual variations in regard to factors such as symptom severity, cognitive functioning, adaptive functioning, comorbid difficulties and participation in leisure activities that may all influence the experience of loneliness. Comorbidity is highly prevalent in ADHD and may impact the risk of loneliness. Individuals with comorbid autism spectrum disorder were not included. In a larger study it would be relevant to take into account the type and severity of the comorbid difficulties. The study relies solely on self-report measures, which may be a limitation, as previous studies have reported positive-bias on the self-report of

children with ADHD (Owens et al. 2007). The positive bias in self-perceptions in the ADHD group may so far best be understood by the self-protective hypothesis or by neuropsychological difficulties (McQuade et al. 2011; Owens et al. 2007). While it was an explicit wish to investigate the adolescents' own experience of loneliness and social support, the inclusion of further data from parent, teacher, and peer reports could have strengthened the understanding of loneliness and social support in ADHD. The adolescents themselves, parents and teachers, may experience both loneliness and social support differently. If so, the different perceptions could in itself help us understand the phenomenon more in depth. In addition, the more objective component of social support such as the quantity of the network and the actual support received was not assessed by our subjective measure of the construct. In future research, it would be relevant to include an objective measure of available social support resources. Likewise, it would be relevant to use a stronger measure of social difficulties and to use multiple sources of report. Finally, we were not able to include a sufficient number of girls in the present study. As girls may experience the investigated phenomena differently and the social response to the girls may differ from the response to boys it would be highly relevant to include girls in future studies.

Despite these limitations, the study adds to existing knowledge of loneliness in ADHD. The present study indicates that social difficulties, as measured by the self-report of difficulties making friends, are not necessarily related to increased loneliness in adolescents with ADHD, and it should be recognized that adolescents with ADHD in a special education setting apparently do not themselves experience a higher degree of loneliness compared to adolescent boys without ADHD. This does not mean that attention to social difficulties is superfluous. Support and special attention should be provided to help maintain and strengthen the experience of adequate social relations.

In order to understand the divergent results concerning loneliness in ADHD longitudinal studies are needed to further investigate the developmental mechanisms associated with loneliness in ADHD. Especially variations in onset of loneliness and changes in degrees of loneliness associated with adolescence should be further investigated. It has previously been suggested that an inclusive school setting may protect against loneliness (Heiman 2005; Langer et al. 2009) in the present study it is suggested that a special educational setting does not increase the risk of loneliness. However it also highlights that we do need to have a more detailed understanding of school settings in order to understand how different contextual characteristics may influence the risk of loneliness. Future studies should focus on specific school features, such as school and

class size, normative climate, knowledge of ADHD, and skills in supporting ADHD, which may affect loneliness in ADHD.

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**Author Contributions** ME and ML collaborated on the design, execution of the study. ML was lead on the following data analyses and ME was lead on the writing of the paper but both collaborated in the process.

### Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no competing interests.

**Ethical Approval** All procedures in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study as from their legal custodians.

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