

Psychosocial Functioning and Life Satisfaction in Adults With Autism Spectrum Disorder Without Intellectual Impairment

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Objectives: This study aimed at (a) comparing psychosocial functioning and life satisfaction in adults with autism spectrum disorder (ASD) and nonclinical participants and (b) identifying areas of functioning that are most predictive for life satisfaction in individuals with ASD. **Method:** A total of 43 adults with ASD without intellectual impairment (age: mean = 31, standard deviation = 10 years; 63% females) and healthy nonclinical individuals (N = 44) were surveyed. **Results:** Individuals with ASD reported significant functional impairments and less life satisfaction compared with nonclinical individuals in many areas of life. Although impairments were prominent in domains involving interaction with other people such as *understanding and communication*, *getting along with others*, and *participation in society*, daily living skills (e.g., *getting around*, *self-care*, and *household*) were not different from nonclinical participants. Participating in society was identified as the only factor predicting life satisfaction in individuals with ASD. **Conclusion:** There is a need for interventions facilitating functioning on a broad level and support toward societal inclusion for individuals with ASD. © 2015 Wiley Periodicals, Inc. *J. Clin. Psychol.* 71:1259–1268, 2015.

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Autism spectrum disorder (ASD) has its onset in childhood and persists throughout the life span. Recent studies have reported prevalence rates of approximately 1% for ASD (Brugha et al., 2011). The characteristics of the disorder are multidimensional: Affected individuals experience deficits in communication and social interaction, restricted interests, and repetitive behavior (American Psychiatric Association [APA], 2013). The variability of functioning in the autism spectrum is high, and there is evidence that autism has a serious effect on an individual's capacity to deal with everyday life challenges in individuals with high intellectual capacity (Saulnier & Klin, 2007). To develop appropriate interventions, it is important to research the levels of functioning in individuals with ASD to determine how they are affected in their daily lives.

Much of the research evidence indicates that young individuals with ASD show a delay in the development of practical life skills. Children and adolescents with high-functioning ASD, i.e., without intellectual impairment, exhibit poorer adaptive functioning levels than typically developed peers (Klin et al., 2007) and peers with language disorders (Liss et al., 2001). Adaptive functioning is defined by the extent to which a person is capable of being self-sufficient in real-life situations, including the functional use of communication, socialization, daily living, and motor skills (Sparrow, Balla, & Cicchetti, 1984; Sparrow, Cicchetti, & Balla, 2005). Children and

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adolescents with ASD show greater deficits in socialization and communication and experience poorer daily living skills (e.g., self-care, domestic and community abilities) in comparison with what would be expected according to their IQ level (Kanne et al., 2011; Klin et al., 2007).

Studies on the outcomes in adulthood of individuals with ASD mostly focus on objective indicators of functioning, such as employment rates and independence (Kamp-Becker, Schröder, Remschmidt, & Bachmann, 2010). Despite a wide variation, such outcomes are generally poor in adults with high-functioning ASD, with only a minority of individuals living independently, being in some form of work or educational program, and reporting social or intimate relationships (Howlin, 2000).

In a recent study conducted in the Netherlands, Barneveld, Swaab, Fagel, van Engeland, and de Sonneville (2014) found that in a large sample of 162 adults with high-functioning ASD, 45% lived with parents or other family members and 21% were institutionalized (supported or residential living), suggesting that there is a great need for public and private support for individuals with ASD despite good intellectual abilities. Although these findings indicate that adults with high-functioning ASD are significantly disadvantaged with respect to psychosocial outcomes in their adulthood, little research has focused on the underlying mechanisms. Bölte and colleagues (2014) argued that given the variability in outcomes in individuals with ASD, the accurate quantification of functioning, which goes beyond categorical diagnosis, is vital for studying outcomes and quality of life.

According to the biopsychosocial model, on which the International Classification of Functioning, Disability and Health (ICF; World Health Organization [WHO], 2001) is based, an individual's level of functioning is the outcome of a complex interaction between health condition, body functions, body structures, activities, participation, environmental factors, and personal factors. Thus, it is important to measure functioning and disability on a broad level that takes into account performances at the body, individual, and societal levels in different life domains, as experienced by an individual in interaction with contextual factors (Leonardi, Bickenbach, Üstün, Kostanjsek, & Chatterji, 2006).

The recently published revision of the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5) recommends the WHO Disability Assessment Schedule 2.0 (WHODAS 2.0; Üstün, Kostanjsek, Chatterji, & Rehm, 2010a) as the best current measure of functioning and disability in daily routines (APA, 2013). Nevertheless, to date, there has been no peer-reviewed study using WHODAS 2.0 in ASD populations.

In recent years, the subjective perspective of an individual has been regarded as increasingly crucial for health outcome assessments (Kulnik & Nikolettou, 2014). Results of a study by Kamp-Becker and colleagues (2010) suggest that individuals with high-functioning ASD not only are disadvantaged regarding objective measures of outcome but also subjectively experience impairments. The authors examined 26 high-functioning adults on the autism spectrum and found that they reported lower levels of health-related quality of life in physical, psychological, and social domains compared with healthy individuals, and lower levels in the social domain compared with individuals with schizophrenia. However, studies on self-reported health outcomes are still limited in individuals with ASD. To extend the existing knowledge about objective measures of functioning and its association with psychosocial outcomes, self-report measures should be applied in ASD.

Regarding the development of relevant interventions, it is crucial to ascertain those areas of functioning that are of particular interest and importance to individuals with ASD. Studying the associations among the levels of psychosocial functioning and life satisfaction could provide insights into needs that are of special importance to individuals with ASD. Farley and colleagues (2009) found that adaptive functioning in adults with ASD (average or near average levels of IQ) was positively associated with a social functioning composite score (based on work status, residential situation, and number and quality of friendships). However, it remains unknown how different levels of functioning are related to the subjective perception of well-being in ASD populations.

The aim of this study was twofold: First, we sought to assess psychosocial functioning and subjective well-being in adults with ASD without intellectual impairments and nonclinical participants by measuring levels of disability and life satisfaction. Second, we aimed at exploring

which areas of functioning best predict life satisfaction in ASD populations with the goal of identifying areas of life that are of particular interest and importance to individuals with ASD.

Method

Participants

A total of 43 individuals diagnosed with ASD and 44 nonclinical participants participated in the study. Participants with ASD were recruited from the autism outpatient clinic of the Department of Psychiatry, Charité – Universitätsmedizin Berlin. Nonclinical participants were recruited via media advertisements.

Procedure

Trained psychiatrists and psychologists conducted diagnostic interviews at the Charité – Universitätsmedizin Berlin; participants completed the self-report questionnaires at home. The Human Subjects and Ethics Committee of Charité – Universitätsmedizin Berlin; approved this study. We obtained written informed consent from each participant after the nature of the experimental procedures was explained.

Measures

Sociodemographic assessment. We used a self-report form to assess age, gender, years of education, and current job and family situation. We used a vocabulary test (Wortschatztest; Schmidt & Metzler, 1992) to assess verbal IQ.

Assessment of ASD diagnoses. We administered the Autism Diagnostic Observation Schedule (Lord et al., 1989) and a semistructured clinical interview based on the DSM-IV (APA, 2000) to establish ASD diagnoses. If a parent was available, we conducted (in 65% of cases) the Autism Diagnostic Interview-Revised (Lord, Rutter, & Le Couteur, 1994). We established final diagnosis based on expert consensus of two clinicians familiar with ASD diagnosis in adulthood, taking into account clinical interviews and scale assessments.

Assessment of comorbidity. In the ASD group, we used the Diagnostic Interview for Mental Disorders-Short Version (Mini-DIPS; Margraf, 1994) to assess current major depression and anxiety disorder. In the nonclinical group, we administered a questionnaire to assess lifetime and current psychiatric diagnosis.

Assessment of psychosocial functioning. We used the German self-administered 36-item version of the WHODAS 2.0 (Üstün et al., 2010a) to measure the levels of psychological functioning. The WHODAS 2.0 is grounded in the conceptual framework of the ICF; it captures an individual's level of functioning in six major life domains: understanding and communicating (cognition); getting around (mobility); self-care (ability to attend to personal hygiene, dressing, and eating, and to live alone); getting along with people (social and interpersonal functioning); life activities (household and work or school activities); and participation in society (participation in family, social, and community activities).

Respondents were asked how much difficulty they experienced in specific areas of functioning during the past 30 days. Responses were rated on a 5-point Likert scale ranging from 2 (*none*) to 5 (*extreme/cannot do*). Overall and domain specific scores are provided. Scores in the domain of life activities can be divided into a score for household and a score for work/school functioning. Participants who are not currently working or studying answer 32 items, while those who are working or studying respond to the entire group of items. We used the 32-item total score.

We administered the item response theory scoring method (Üstün et al., 2010a), transforming initial codings into scores between 0 and 100, based on the multiple levels of difficulty of each item, with higher scores reflecting greater disability. The WHODAS 2.0 has high internal

consistency (Cronbach's alpha for different domains of $\alpha = .79$ to $\alpha = .98$), a stable factor structure, high test-retest reliability (intraclass correlation coefficient of .93 to .96), good concurrent validity, and good responsiveness (i.e., sensitivity to change; Ustün et al., 2010b).

Assessment of life satisfaction. We used the German Quality of Life questionnaire "Fragebogen zur Lebenszufriedenheit" (FLZ; Fahrenberg, Myrtek, Schumacher, & Brähler, 2000) to evaluate life satisfaction. The FLZ assesses satisfaction in 10 domains of life: health, job, income, leisure time, partnership, relationship with the own children, self, sexuality, friends and relatives, and housing. Each domain comprises seven items, which can be scored on a 7-point Likert scale ranging from 1 (*very unsatisfied*) to 7 (*very satisfied*).

In addition to measuring domain-specific life satisfaction, the FLZ makes possible the assessment of general life satisfaction, which is calculated as the sum value of 7 of the 10 scales, not taking into account the scales for job, partnership, and relationship with their own children (Fahrenberg et al., 2000). We excluded the scale for sexuality from the total score because many participants (ASD: 30%; nonclinical participants: 9%) did not provide information about satisfaction with their sexual life, probably partly because of the lack of current relationships (ASD: 72%; nonclinical participants: 50%). The FLZ has high internal consistency (Cronbach's alpha for the different domains of $\alpha = .82$ to $\alpha = .95$). Validity has been ensured by factor analysis and correlations to different socioeconomic variables as well as personality traits (Fahrenberg et al., 2000).

Data Analysis

To determine sociodemographic characteristics and test for group differences in sociodemographic variables, we conducted descriptive analyses, analyses of variance (ANOVAs), and Fisher's exact test. We conducted analyses of covariance (ANCOVAs) to determine differences in levels of psychosocial functioning and satisfaction between groups; central sociodemographic variables that differed between groups were included as covariates. Because of multiple testing, we administered corrected levels of significance using the false discovery rate procedure by Benjamini and Hochberg (1995). To examine the effect of domains of functioning on overall life satisfaction, we performed stepwise multiple regressions in each group. We conducted all statistical analyses with IBM SPSS Statistics (version 18.0.0) using two-sided tests of significance at the 0.05 alpha level, unless otherwise specified.

Results

We report the sociodemographic characteristics of both nonclinical and ASD samples in Table 1. Groups did not differ concerning age, $F(1,85) = 0.86$, $p = .358$, $\eta^2 = .010$, years of education, $F(1,84) = 0.02$, $p = .881$, $\eta^2 = .000$, and gender ($p = .663$, two-tailed Fisher's exact test). There was a difference in IQ between groups, $F(1,83) = 4.57$, $p = .036$, $\eta^2 = .052$, with ASD participants (mean [M] = 108) showing slightly higher IQ than the nonclinical group ($M = 103$). Of the individuals with ASD, 17% had a current diagnosis of a major depression and 19% had a diagnosis of an anxiety disorder; comparisons with the nonclinical group were significant in both cases ($p = .005$ and $p = .002$, two-tailed Fisher's exact test, respectively).

Levels of psychosocial functioning

Cronbach's alpha of WHODAS 2.0 was $\alpha = .934$ in the ASD group and $\alpha = .954$ in the nonclinical group. To examine group differences in functioning levels, one-way ANCOVAs with group as an independent variable, IQ, current major depression and current anxiety disorder as covariates, and WHODAS 2.0 scores as dependent variables were run. ASD participants reported more difficulties in overall functioning and on the subscales understanding and communication, getting along with others, school or work and participation in society compared with nonclinical participants. More detailed results are reported in Table 2.

Table 1
Sociodemographic Characteristics of ASD and Nonclinical Sample

	ASD		Nonclinical		Test statistic	p
	N	Mean (SD)/percent	N	Mean (SD)/percent		
Age	43	31 (10)	44	30 (5)	$F(1,85) = 0.855$.358
IQ	42	108 (13)	43	103 (11)	$F(1,83) = 4.566$.036
Years of education	42	11 (2)	44	11 (2)	$F(1,84) = 0.023$.881
Gender					Fisher's exact test	.663
Female	27	63%	25	57%		
Male	16	37%	19	43%		
Employment					Fisher's exact test	.011
Yes	14	33%	27	61%		
No	28	67%	17	39%		
Partnership					Fisher's exact test	.048
Yes	12	28%	22	50%		
No	31	72%	22	50%		
Major depression					Fisher's exact test	.005
Yes	7	17%	0	0%		
No	35	83%	44	100%		
Anxiety disorder					Fisher's exact test	.002
Yes	8	19%	0	0%		
No	34	81%	44	100%		

Note. ASD = autism spectrum disorder; SD = standard deviation. Bolded values indicate statistical significance.

Table 2
Mean WHODAS 2.0 Total and Subscale Scores for ASD and Nonclinical Sample

	ASD		Nonclinical		F	p ^a	η ²
	N	M (SD)	N	M (SD)			
WHODAS 2.0							
Total	40	38.9 (18.9)	41	14.7 (14.8)	22.95 (1,76)	< .001	.232
Understanding and communication	42	41.3 (22.4)	43	16.1 (17.7)	18.58 (1,80)	< .001	.189
Getting around	42	20.2 (23.8)	43	8.4 (14.1)	2.89 (1,80)	.093	.035
Self-care	42	11.7 (21.4)	43	4.0 (9.0)	3.18 (1,80)	.078	.038
Getting along with others	42	62.1 (25.0)	43	19.4 (21.6)	44.45 (1,80)	< .001	.357
Household	42	40.5 (33.6)	42	22.4 (22.6)	3.33 (1,79)	.072	.040
School or work	30	39.1 (27.6)	33	14.9 (17.5)	8.11 (1,58)	.006	.123
Participation in society	40	46.6 (26.9)	41	15.7 (19.7)	19.48 (1,76)	< .001	.204

Note. WHODAS = World Health Organization Disability Assessment Schedule; ASD = autism spectrum disorder; M = mean; SD = standard deviation. Bolded values indicate statistical significance.

^aAn adjusted level of significance according to Benjamin and Hochberg (1995) at $q = .031$ was considered as significant.

Levels of life satisfaction

Cronbach's alpha of FLZ (taking into account items included in the overall FLZ score) was $\alpha = .949$ in the ASD group and $\alpha = .935$ in the nonclinical group. To examine group differences in life satisfaction across different areas of life, we conducted one-way ANCOVAs with group as an independent variable, IQ, current major depression and current anxiety disorder as covariates, and the FLZ scores as dependent variables. Individuals with ASD reported significantly lower

Table 3
Mean FLZ Total and Subscale Scores for ASD and Nonclinical Sample

	ASD		Nonclinical		<i>F</i>	<i>p</i> ^a	η^2
	<i>N</i>	<i>M</i> (<i>SD</i>)	<i>N</i>	<i>M</i> (<i>SD</i>)			
FLZ							
Total	35	172.8 (39.4)	41	212.9 (32.0)	9.30 (1,71)	.003	.116
Health	42	30.3 (9.0)	42	37.4 (7.2)	6.93 (1,79)	.010	.081
Job	38	27.2 (9.7)	40	32.5 (9.5)	0.78 (1,73)	.379	.011
Income	39	26.8 (9.5)	43	30.4 (9.8)	0.40 (1,77)	.528	.005
Leisure time	39	26.9 (9.1)	42	33.4 (8.2)	3.67 (1,76)	.059	.046
Partnership	13	33.2 (9.3)	28	40.8 (8.4)	n/a	n/a	n/a
Relationship own children	6	32.5 (5.3)	9	44.6 (2.8)	n/a	n/a	n/a
Self	42	26.3 (8.5)	43	37.1 (6.5)	23.41 (1,80)	< .001	.226
Sexuality	29	28.0 (7.9)	39	38.2 (6.4)	23.11 (1,63)	< .001	.268
Friends & relatives	39	28.7 (5.8)	43	36.3 (6.5)	17.51 (1,77)	< .001	.185
Housing	40	34.3 (7.5)	43	37.8 (5.9)	0.92 (1,78)	.341	.012

Note. FLZ = German Quality of Life Questionnaire; ASD = autism spectrum disorder; M = mean; SD = standard deviation. n/a = not applicable because of small cell sizes. Bolded values indicate statistical significance.

^aAn adjusted level of significance according to Benjamin and Hochberg (1995) at $q = .023$ was considered as significant.

levels of overall life satisfaction than nonclinical participants. Also in the subscales health, self, sexuality, and friends and relatives, individuals with ASD reported lower levels of satisfaction. More detailed information is reported in Table 3.

Prediction of life satisfaction by levels of psychosocial functioning

To identify areas of functioning that are of particular importance in each group, stepwise multiple regressions with the FLZ total score as a dependent variable and the WHODAS 2.0 subscale scores as independent variables were conducted in both groups. For participants with ASD, participation in society was the only significant predictor explaining 49% of the variance of overall life satisfaction, $F(1,21) = 20.26, p < .001$. The less difficulties ASD participants experienced participating in society, the more they were satisfied with their life. In the nonclinical group, understanding and communication was a significant predictor in a first step and participation in society in a second step. Results indicated that understanding and communication explained 53% of the variance in satisfaction, $F(1,31) = 34.46, p < .001$. Furthermore, participation in society explained an incremental 6% of the variance, $F(1,30) = 21.67, p < .001$. Results suggest that nonclinical participants are more likely to be satisfied with their life if they have good abilities to understand and communicate and participate in societal activities.

Discussion

The aim of the study was to (a) assess perceived levels of functioning and satisfaction across different areas of life in high-functioning adults with ASD and (b) identify areas of life in which levels of functioning are most relevant for subjective general well-being.

Despite average levels of IQ, we found that adults with ASD exhibited more self-reported impairments than nonclinical participants in the areas of understanding and communication, getting along with others, school or work, and participation in society. However, in the areas of mobility, household, and self-care, individuals with ASD did not differ from the nonclinical group. Hence, individuals with ASD exhibit higher levels of perceived disability in those areas of functioning that involve a great extent of social interaction (understanding and communication, getting along with others, and participation in society), which is in line with the diagnostic picture

of the disorder and other studies and suggests weaknesses in social rather than other domains of functioning (Bölte & Poustka, 2002; Carter et al., 1998). This might also be the case for the domains school or work, in which many individuals with ASD report social interaction problems. For example, Kirchner and Dziobek (2014) found problems in interacting with colleagues, superiors, and clients as one of the main factors interfering with work performance.

On the other hand, differences in self-report between autistic and nonclinical participants regarding the more practical domains (mobility, household, self-care) were not significant, which is in line with the typical pattern of adaptive behavior in autism, marked by significant deficits in the social domains but a relative strength in daily living skills (Bölte & Poustka, 2002; Carter et al., 1998).

In line with the experience of higher levels of overall disability, individuals with ASD were generally less satisfied with their life than were nonclinical participants. With respect to the different subscales of the FLZ, this trend of less satisfaction was also found in the areas of health, self, sexuality, and friends and relatives. Hence, satisfaction with life in high-functioning individuals with ASD seems to be specifically low regarding social aspects of life. This is in line with other studies, which found satisfaction with social relationships and health to be low in individuals with ASD (Barneveld et al., 2014; Kamp-Becker et al., 2010).

However, there were no differences between groups regarding job, income, leisure time, and housing, which is surprising because individuals with ASD are often disadvantaged regarding outcome measures related to this areas of life, e.g., higher unemployment rates or underemployment, low rates of independent living, and few daily activities (Howlin & Moss, 2012). However, the fact that we found no group differences despite descriptively lower scores in ASD could be partly because of our small sample size, which does not allow for the detection of small and medium effects.

To develop appropriate interventions, it is essential to identify functional areas that are relevant for the subjective well-being of an individual. We aimed to address this issue by examining the relationship between levels of functioning and life satisfaction in each group. We found that the ability to participate in society, such as joining community activities, such as festivities or religious activities, did significantly predict life satisfaction in individuals with ASD and nonclinical participants. Interestingly, in individuals with ASD, the ability to participate in society was the only significant predictor, explaining 49% of the variance in overall life satisfaction, whereas functional areas, such as getting along with others, did not explain incremental variance. However, participation in society can take various forms, such as being a member of a community group or a sports club, which can be relatively independent of face-to-face social interaction skills. This shows that social inclusion is an important aim for individuals with ASD, which can be driven by, for example, joint interest in matters rather than communicative exchanges.

A recently published study on a cohort of 41 adults with ASD, of which 38 (93%) were members of the Church of the Latter Day Saints in Utah (Farley et al., 2009), demonstrated how positive outcomes might be associated with community support. Participants in this study showed relatively good outcomes compared with similar cohorts with ASD, with none of them exhibiting very poor outcomes and only 17% exhibiting poor outcomes. Farley and colleagues (2009) suggested that these findings were probably because of the fact that participants grew up in and continued to live in a society in which social inclusion and cohesion are strong cultural values.

The finding that societal inclusion was the best predictor for life satisfaction in the ASD group is preliminary but would have implications for intervention planning. Although many interventions for adults with ASD predominately focus on social cognition training (Bishop-Fitzpatrick, Minshew, & Eack, 2013), it could be desirable to also focus on practicable skills that facilitate integration in society. For instance, García-Villamisar and Dattilo (2010) found that a 1-year leisure intervention that, among other goals, aimed at facilitating the ability to attend events and participate in other recreation activities, was effective in significantly decreasing overall scores of stress levels and increasing quality of life in adults with ASD.

We believe that to enhance the feeling of being included in society, it is also important to create a respectful and welcoming atmosphere that facilitates participation in society. Extant self-help groups, which organize events, group vacations, and workshops for employment

preparation, show that there is a clear need for social participation, alliance, and interdependent support among individuals with ASD. There are successful projects that promote the inclusion of individuals with ASD, such as the Academic Autistic Spectrum Partnership in Research and Education (<http://www.aaspire.org>) or the Autism Research Cooperation (<http://www.autismusforschungs-kooperation.de>). These projects bring together the academic and autistic communities to develop and undertake research projects deemed relevant by individuals on the autism spectrum.

An increasing number of individuals with ASD seek to change society's perception of autism. To foster the social inclusion of diagnosed individuals, it is important to face individuals with ASD with not just a deficient-oriented attitude, but an appreciative one.

Limitations and Strengths of the Study

Several limitations of the study should be mentioned. First, all data were based on self-report measures. There is evidence that individuals with ASD have difficulty reflecting on their own psychological selves (Frith & Happe, 1999; Williams, 2010), and, thus, our findings could be biased. That said, self-reports provide access to a subjective perspective, which is important and cannot be captured by parental or caregiver information.

Second, we used a cross-sectional research design, which makes it possible to determine the associations, but not the causation, between levels of functioning and life satisfaction. Results regarding the predictors of life satisfaction in adults with ASD are of exploratory nature only and have to be interpreted with caution. Longitudinal studies, using cross-validation methods or theory-driven a priori analysis approaches are warranted for future studies on predictors of life satisfaction in adults with ASD.

Despite these limitations, however, the study was the first study to use the WHODAS 2.0 in an ASD population, describing levels of functioning on a broad level in adult individuals with ASD from a subjective perspective.

Conclusion

This study showed that adults on the autism spectrum without intellectual impairment experience significant functional impairments in social domains compared with nonclinical participants, but they are relatively competent in daily living skills. Further research should examine how the propensity for repetitive and routine behavior, which probably underlies the relative strengths in some daily living skills, can also serve as a resource in other areas of functioning.

Participation in society was identified as the most important factor for predicting well-being in individuals with ASD. Consequently, more support should be provided to individuals with ASD regarding societal inclusion, including programs fostering appropriate skill development in individuals with ASD. In addition, typically developed members of society should make an effort to respectfully and appreciatively interact with ASD individuals.

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