The Adolescent Internet Adaptability Scale: Development and Psychometric Properties

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Abstract

This study presents the development and validation of the Adolescent Internet Adaptability Scale (AIAS), designed to assess adolescents' adaptive capacities in Internet use. The scale development encompassed multiple phases with diverse sample sizes: item pool generation through interviews (n = 15), scale structure analysis via Exploratory Factor Analysis (EFA, n = 553) and Confirmatory Factor Analysis (CFA, n = 4,637), along with reliability (n = 4,637) and validity (n = 4,637) analyses. The reliability phase included alpha, composite reliability, and retest reliability (n = 132), while the validity phase covered structural, convergent, discriminant, criterion-related validity, and measurement invariance tests. The AIAS, comprising eight dimensions—Internet curiosity, Internet self-efficacy, Internet learning ability, Internet socialization ability, Internet information search ability, Internet information protection ability, Internet self-control ability, and Internet positive coping ability—demonstrates strong reliability and validity. It shows positive correlations with Internet use—parental active help, well-being, and meaning in life, and negative correlations with Internet addiction and depression, with stronger associations observed with positive indicators. These findings highlight the Internet's potential as a platform for strength acquisition. The AIAS, with its comprehensive nature, is promising for tailoring adolescent support from a positive psychology perspective, enabling holistic assessment and targeted interventions. It also advances understanding of youth development in the digital era, proving valuable for clinical and research applications. Ongoing evaluation, cross-cultural validation, and longitudinal research are essential for realizing its full potential. This multidimensional scale significantly advances the assessment of adolescent Internet use, equipping stakeholders to effectively address adolescents' digital behaviors for enhancing well-being.

Keywords: adolescents; Internet adaptability; scale development; psychometric; digital well-being; media literacy

Introduction

In China, there are 183 million adolescent Internet users, representing 13.3% of the country's total online population (CNNIC, 2023). While the Internet provides vast opportunities for learning, communication, and access to information (Di Giuseppe et al., 2020; Szymkowiak et al., 2021; Vaterlaus et al., 2016), excessive use is associated with significant physical and psychological issues (Chung et al., 2019; Kokka et al., 2021; Zhang et al., 2021). In response to these challenges, this study introduces the Adolescent Internet Adaptability Scale (AIAS), a pioneering tool designed to assess adolescents' adaptability to the Internet environment. Notably, the AIAS is the first comprehensive measure to evaluate both positive Internet skills and related dimensions, addressing a critical gap in existing research. This scale not only assesses potential risks but also emphasizes the positive capabilities adolescents can develop through Internet use, thereby promoting their well-being in the digital age.

Existing Measures Limit Understanding of Adolescent Internet Use

As adolescents navigate increasingly complex online environments, it is essential to understand their adaptation to this evolving digital ecosystem. Existing measures—such as the Digital Flourishing Scale (Janicke-Bowles, 2024), Perceived Digital Well-Being in Adolescence Scale (Rosič et al., 2024), and Social Media Information Literacy Scale (Heiss et al., 2023)—offer valuable insights into positive online experiences, subjective well-being, and critical engagement with social media content. Despite these contributions, these tools are limited by their focus on specific domains, such as subjective experiences or technical skills, rather than providing a comprehensive view of adolescents' ability to adapt holistically to the digital environment. For instance, media literacy scales often adopt an instrumental perspective, emphasizing Internet navigation and appraisal while neglecting emotional and behavioral aspects like resilience and self-control. Similarly, digital flourishing and well-being scales may focus on self-development and positive interactions but fail to capture the adaptive processes necessary to balance risks and benefits in dynamic online contexts. These limitations highlight a critical gap in assessing how adolescents actively adapt to the Internet environment, underscoring the need for a multidimensional perspective that encompasses both challenges and opportunities in the digital world.

Building on the principles of positive psychology, which emphasize a strengths-based approach to understanding human potential and motivation (Sheldon & King, 2001), it is essential to adopt a balanced perspective on adolescents' online experiences. Rather than focusing solely on risks or benefits, a comprehensive approach can illuminate how adolescents navigate the complexities of the digital world, fostering both their well-being and development. However, the current lack of psychometrically robust tools hinders efforts to accurately assess their level of healthy online adjustment. This gap makes it challenging for parents, teachers, and adolescents themselves to identify and support adaptive behaviors. Thus, there is an urgent need for research and assessments that holistically capture both the challenges and opportunities of Internet use in the lives of today's adolescents.

Adolescent Internet Adaptability

The concept of Internet adaptability refers to adolescents' ability to navigate the opportunities and challenges of the digital world in a healthy and productive manner (W. Wang et al., 2021). In his theory of cognitive development, Piaget (1971) emphasized the importance of adaptation in adolescents' social relationships and environments. Extending this framework, the adaptation of adolescents to the Internet can be understood as an active process in which they strive to balance risks and benefits in their online interactions. This suggests that adolescents require a distinct cognitive structure to positively adapt to the abstract nature of the Internet. Building on this idea, W. Wang et al. (2021) introduced the concept of "Internet adaptability," which combines insights from social adaptation studies with the unique characteristics of the Internet environment. They identified eight key dimensions of Internet adaptability:

Internet attitude: The cognitive and emotional orientation toward the Internet, fostering acceptance and engagement with technology.

Internet knowledge and skills: The understanding and abilities necessary to use the Internet effectively.

Internet sense of control: The perception of one's ability to influence and manage online interactions.

Internet self-efficacy: The belief in one's ability to accomplish tasks on the Internet.

Internet adaptability: The ability to adjust behaviors and skills to suit various online environments.

Internet self-control: The capacity to regulate Internet use and prevent excessive or harmful behaviors.

Internet mental resilience: The ability to maintain mental health despite challenges encountered online.

Internet initiative: The proactive approach to engaging and improving online interactions.

While W. Wang et al. (2021) provided an important theoretical foundation, there is still a need for a psychometrically validated scale to empirically assess adolescents' Internet adaptability.

Criterion-Related Variables

Adolescent Internet adaptability, defined as the ability to positively adapt to the Internet environment, is a relatively new concept, and existing research on this topic remains limited. Therefore, we grounded the selection of validity criteria in theoretical frameworks and empirical evidence, choosing measures with strong conceptual and theoretical associations with adolescent Internet adaptability.

Subjective Well-Being and Meaning in Life

The definition of adolescent Internet adaptability implies a capacity to use the Internet environment constructively and harmoniously, which aligns with better psychological and emotional well-being. According to the broaden-and-build theory (Fredrickson, 2001), adaptive engagement with positive environments fosters the accumulation of resources that enhance well-being. Empirical studies have similarly found that individuals who effectively manage online environments report greater satisfaction with life and a sense of purpose (Chang et al., 2015; W. Wang et al., 2023). Therefore, subjective well-being and meaning in life were chosen as positive indicators of adolescent Internet adaptability.

Internet Addiction

Adolescents with lower Internet adaptability are more likely to struggle with self-regulation in online contexts, increasing their risk of internet addiction (Mao et al., 2024). This association is consistent with research suggesting that deficits in adaptability lead to maladaptive coping strategies, such as excessive or uncontrolled online behavior (Mei et al., 2016). Thus, Internet addiction serves as a negative criterion-related measure, reflecting potential risks stemming from inadequate adaptability.

Depression

Depression is a widely recognized indicator of poor psychological functioning, often associated with difficulties in managing challenges and negative emotions (Beck, 1967). Adolescents with higher Internet adaptability are expected to demonstrate greater resilience in the face of online stressors, reducing the likelihood of depressive symptoms. Prior studies have established that effective coping strategies and adaptive resource use are inversely related to depression levels (Eisenbeck et al., 2021; Thompson et al., 2010). Therefore, we included depression as a criterion-related measure, where lower depression scores signify higher Internet adaptability.

Internet Use—Parental Active Help

From the perspective of the conservation of resources theory (Hobfoll et al., 2018), positive psychological resources, such as family support, tend to cluster and reinforce one another. Internet use—parental active help, encompassing guidance, encouragement, and monitoring of online activities, provides adolescents with the skills and emotional support necessary to navigate the Internet effectively. Empirical studies have shown that such support not only fosters positive online behavior but also promotes a sense of security and adaptability in adolescents (Gür & Türel, 2022; Kurock et al., 2024; Livingstone et al., 2017). Therefore, we hypothesized that higher Internet use—parental active help would positively correlate with adolescent Internet adaptability.

In summary, we selected these criterion-related variables based on their theoretical relevance and empirical evidence of their relationship to Internet adaptability.

Current Study

Research shows that adolescents tend to use the Internet extensively; however, existing measurement tools fail to adequately assess their capacity for positive adaptation to this environment. While key dimensions of Internet adaptability have been identified (W. Wang et al., 2021), no validated scale currently exists to effectively measure adolescents' Internet adaptability. The present study aims to address this gap by developing a psychometrically sound scale to assess adolescent Internet adaptability and evaluate its reliability and validity. The development of this scale will enable researchers and practitioners to identify individuals who may struggle with effective online engagement and to target appropriate interventions. Additionally, it will provide a valuable tool for future research exploring the correlates and outcomes related to adolescents' ability to thrive in modern digital landscapes. This study follows established best practices for scale development (Hinkin, 1995). The research process involved four distinct samples and four critical stages: item pool generation, scale construction, reliability assessment, and validity assessment. A visual representation of the research process is provided in the diagram below:

Figure 1. *Study Process Diagram.*
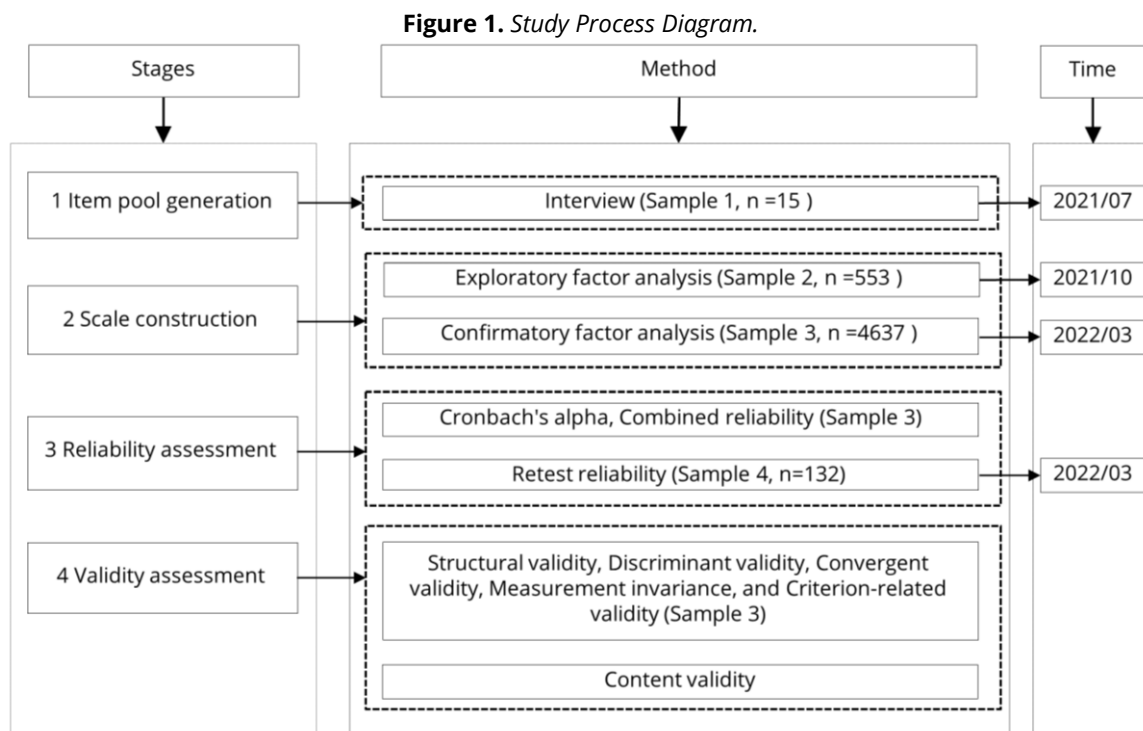
Methods

Participants and Procedures

Researchers have argued that the age range of adolescents should be extended somewhat with increasing years of education (Granic et al., 2020). Accordingly, our study includes not only adolescents aged 12–18 years but also a portion of the college student population.

The first stage involved generating an item pool with participants from Sample 1, which included 15 students from a middle school, a high school, and a university in a city in Hubei Province. Participants' ages ranged from 12 to 20 years, with 8 females and 7 males. Upon completion of the interviews, each participant received a gift worth 20 RMB.

The second stage focused on examining the factor structure of the scale, with participants from Samples 2 and 3. Sample 2 consisted of 553 participants (M_{age} = 17.33, SD_{age} = 2.60, 62.00% female), who were recruited using a cluster sampling strategy from middle schools, high schools, and universities in Hubei. Sample 3 included 4,637 participants (M_{age} = 17.19, SD_{age} = 2.61, 62.20% female), who were also recruited using cluster sampling from middle schools, high schools, and universities in Hubei, Hunan, and Jiangxi provinces.

The third stage involved assessing the reliability of the scale with participants from Samples 3 and 4. Sample 4 consisted of 132 participants (M_{age} = 16.06, SD_{age} = 0.27, 44.70% female), who were recruited through a survey from a high school in a city in Hubei.

The final stage focused on assessing the validity of the scale with participants from Sample 3.

This study was part of a National Natural Science Foundation of China project and received support from multiple schools across China. Participants were recruited directly by classroom teachers from their respective classes. All participants, except those interviewed (who received 20 RMB), were given a gift worth 2 RMB upon completion of the survey.

Ethics approval for this study was granted by the Academic Ethics Review Committee of the School of Psychology at Central China Normal University. Informed consent was obtained from both university students and adolescent participants, as well as from the legal guardians of adolescent participants. They were also informed that they could withdraw from the study at any time without facing any consequences. All data were fully anonymized; however, longitudinal data were used for analysis in accordance with ethical guidelines and with participant consent.

Item Pool Generation

The original model of Internet adaptability comprises eight dimensions: Internet attitude, Internet knowledge and skills, Internet sense of control, Internet self-efficacy, Internet adaptability, Internet self-control, Internet mental resilience, and Internet initiative (W. Wang et al., 2021). To better align these dimensions with the specific aspects of adolescents' Internet use in the current context, we interviewed 15 adolescents (Sample 1) to gather their perceptions of each dimension. Based on the interview results, we refined the adolescents' Internet adaptability model and generated an item pool. Our approach aimed to ground the scale in the lived experiences of adolescents, ensuring its relevance and applicability.

Scale Construction

Exploratory Factor Analysis (EFA)

To explore the factor structure of the item pool and remove irrelevant items, we conducted an Exploratory Factor Analysis (EFA) using Jamovi version 2.3. A total of 533 participants (Sample 2) took part in the EFA. The methods used for factor extraction and rotation were maximum likelihood estimation and oblimin rotation, respectively. To enhance the objectivity of factor extraction, we also employed a parallel analysis method (O'connor, 2000). To ensure scale simplicity, items with cross-loadings above 0.3 and factor loading values below 0.45 were deleted (Hinkin, 1995; Worthington & Whittaker, 2006).

Confirmatory Factor Analysis (CFA)

Following the EFA, we tested the validity of the factor structure by performing Confirmatory Factor Analysis (CFA) on the remaining items using Jamovi version 2.3. A total of 4,637 participants (Sample 3) participated in the CFA. In line with Bollen and Stine's (1992) guidelines, we used multiple global fit indices, including indices of absolute and relative fit (i.e., CFI, TLI, RMSEA, and SRMR). Acceptable fit was indicated by SRMR ≤ .10, RMSEA ≤ .08, CFI ≥ .90, and TLI ≥ .90. Items with factor loadings below 0.45 were removed.

Reliability Assessment

The reliability of the scale was assessed using Jamovi. The main reliability measures included Cronbach's alpha, combined reliability, and test-retest reliability, for both the entire scale and each individual dimension. Sample 3 was used for all reliability calculations, except for test-retest reliability, which was calculated based on data from 132 participants (Sample 4). The retest interval was two weeks.

Validity Assessment

The validity assessment of the scale included content validity, structural validity, criterion-related validity, discriminant validity, convergent validity, and measurement invariance.

Content Validity

After generating the item pool, each item was reviewed by a panel of experts to ensure it met content validity standards. The expert team consisted of two PhDs in psychology and three master's students in psychology. They assessed whether the items and the dimensions aligned with the theoretical structure of the scale.

Structural Validity

Structural validity was assessed using CFA. The structural validity of the scale is considered acceptable if the model fit indices from the CFA meet the established criteria (Hinkin, 1995).

Criterion-Related Validity

Criterion-related validity is a type of validity that assesses how well a measure or test is related to an external criterion or outcome that is expected to be associated with the construct being measured (DeVellis, 2017). In this study, we selected five criterion measures to investigate using data from Sample 3: depression, subjective well-being, meaning in life, Internet addiction, and parental active help with Internet use.

Depression was assessed using the Patient Health Questionnaire-2, developed by Löwe et al. (2005). This questionnaire consists of two items (e.g., *Feeling down, depressed*, or *hopeless*) and is scored on a four-point Likert scale (*never–always*). Higher scores indicate a higher level of depression. In the current study, the internal consistency reliability was .85.

Internet Use—Parental Active Help was assessed using a subscale of the Parental Mediation of Online Activities Questionnaire, developed by Livingstone and Helsper (2008) and adapted to the Chinese context by Wu et al. (2019). The subscale consists of eight items (e.g., *Your parents helped you when you had trouble on the Internet*) rated on a four-point Likert scale (*never–always*). Higher scores reflect greater parental involvement in Internet use. In this study, the internal consistency reliability was .90.

Internet Addiction was assessed using the Internet Addiction Questionnaire, developed by Young et al. (1998). This measure includes eight items (e.g., *I often spend more time online than I planned*), rated on a four-point Likert scale (*never-always*). Higher scores indicate a greater level of Internet addiction. In this study, the internal consistency reliability was .88.

Subjective Well-Being was assessed using a single-item measure: *In general, how would you rate your overall well-being?* This measure has demonstrated good reliability in previous studies (Andrews & Withey, 1976; Pavot & Diener, 1993). The present study used a four-point Likert scale (*poor–excellent*).

Meaning in Life was assessed using the Chinese version of the Meaning in Life Questionnaire (MILQ; W. Chen et al., 2015), adapted from the original scale by Steger et al. (2006). The MILQ consists of 10 items (e.g., *I know the meaning of my life well*), rated on a 7-point Likert scale (from 1 = *completely disagree* to 7 = *completely agree*). Higher total scores indicate a greater sense of meaning in life. In this study, the MILQ demonstrated strong reliability, with a Cronbach's alpha of .89.

Discriminant Validity

Discriminant validity is demonstrated when the correlations between different constructs are lower than those within the same construct (Bagozzi, 1981). To assess discriminant validity, we used the heterotrait–monotrait ratio (HTMT, Henseler et al., 2015). An HTMT value greater than 0.85 indicates unacceptable discriminant validity between two dimensions.

Convergent Validity

Convergent validity is supported by high intercorrelations among indicators of the same construct (Bagozzi, 1981). To evaluate convergent validity, we used the average variance extracted (AVE). A value below 0.36 suggests unacceptable convergent validity for a dimension (W. Chen et al., 2016).

Measurement Invariance

Establishing measurement invariance supports the validity of a scale by demonstrating that it measures the construct consistently across different demographic groups. Generally, achieving metric invariance is sufficient to establish measurement invariance for a given group. This is assessed by comparing models using indices such as CFI and RMSEA difference tests (F. F. Chen, 2007). If the change in CFI and RMSEA between the metric invariance model and the baseline model is less than .01 and .015, respectively, the model is considered to have established measurement invariance (F. F. Chen, 2007).

Results

Item Pool Generation and Content Validity

Based on the interview results (Sample 1), we developed a theoretical model of adolescents' Internet adaptability. The interviews revealed that most adolescents considered Internet curiosity to be the core attitude enabling positive adaptation to the Internet environment. As a result, we refined the dimension of Internet attitude to focus on Internet curiosity.

In the interviews, adolescents rarely mentioned terms related to Internet knowledge and skills. Further questioning revealed that they did not perceive this dimension as influencing their adaptability to the Internet environment. Consequently, we removed it from the model.

Both Internet sense of control in the adaptation process and self-control in the persistence stage were frequently mentioned in the interviews. Most adolescents viewed these concepts as similar, as they both reflected the ability to manage one's behavior online. Therefore, we combined them into a single dimension: Internet self-control capability.

According to the interview responses, the concept of Internet adaptability was perceived as too broad and could be divided into three major aspects: information, social, and learning. Therefore, we divided adaptability into three corresponding dimensions: Internet information ability, Internet socialization ability, and Internet learning ability.

Additionally, most interviewees believed that mental resilience and initiative were best expressed as the ability to proactively cope with challenges online. As a result, we combined these two dimensions into Internet positive coping ability.

Finally, Internet self-efficacy was seen by interviewees as an important factor in adapting to the Internet environment, so we retained this dimension.

In summary, we initially developed a theoretical model of adolescent Internet adaptability, consisting of seven dimensions. Based on the interview results, the theoretical model, and existing similar questionnaires, we created the initial items for the scale (see Appendix). The scale consists of 53 items, rated on a six-point Likert scale (Not like me at all ~ Exactly like me). The specific dimensional information of the scale is provided in Table 1.

To enhance the content validity of the scale, all original items were reviewed by a team of experts consisting of two PhDs and three master's degree students in psychology. The analysis confirmed that all items were consistent with the construct of adolescent Internet adaptability.

Table 1. *Dimensional Information From the Interviews.*

Dimension	Item source description	Examples of interview content	Number of items
Internet self-control ability	Interview results	I feel like the Internet is under my control. I play when I need to play, and I don't play when I don't need to play. (F1)	5
Internet socialization ability	Interview results	I've met a lot of interesting people, and it's been very rewarding for me. Some people's thoughts also make me think that there are people like this who have this kind of idea, so that I have a much broader vision. (M4)	10
Internet positive coping ability	Interview results and existing coping questionnaires (X. Wang, Ma, & Ma, 1993)	When I have a problem that I don't understand, I search the Internet for information about it. (F5)	8
Internet information ability	Interview results	When I see something unknown or a link to something, I will protect myself by not clicking on it. (F3) Even if the program encountered problems, I also Baidu (like google) why it will be so. (M2)	12
Internet learning ability	Interview results	For example, if I don't know something, I'll watch a video online and learn it, and then I'll be able to do it myself. I still mostly rely on the various resources on my computer to learn on my own. (F2)	5
Internet self-efficacy	Interview results	I should be able to learn things online faster than other people. (F6)	8
Internet curiosity	Interview results and existing curiosity questionnaires (Kashdan et al., 2009).	I would be curious about things online and then go on a serious quest to explore and learn about them. (M6)	5

Note. F1, M4, M2, F3, F5, F2, F6, and M6 were interview participants.

Scale Construction

Exploratory Factor Analysis

The 53 items across 7 dimensions, identified from the interview results, were analyzed using Exploratory Factor Analysis (EFA). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.933 (χ^2 = 22,922.341, df = 1,378, p < .001), indicating that the scale items were suitable for EFA. Items with factor loadings below 0.45 or cross-loadings above 0.3 were removed. The final factor loadings are presented in Table 2.

Table 2. *Factor Loadings From EFA (n = 553).*

Items/Dimensions	1	2	3	4	5	6	7	8	Uniqueness
1	.88								.17
2	.88								.19
3	.81								.20
4	.76								.24
5	.74								.35
6	.63								.27
7									**.72**
8		.64							.42
9		.63							.32
10		.62							.36
11		.60							.29
12		.56							.51
13		**.53**				**.31**			**.24**
14		**.50**				**.34**			**.23**
15			.67						.38
16			.62						.45
17			.60						.53
18			.58						.40
19			.56						.52
20			.53						.57
21			.52						.56
22				.80					.28
23				.78					.18
24				.71					.28
25				.64					.47
26									**.32**
27					.80				.28
28					.80				.33
29					.64				.50
30					.62				.50
31					.50				.58
32						.63			.20
33						.63			.18
34						.56			.29
35						.45			.34
36						.45			.30
37									**.19**
38							.84		.26
39							.68		.37
40							.55		.50
41									**.36**
42								.73	.35
43								.59	.36
44								.52	.58
45								.47	.40
46									**.29**
47									**.37**
48									**.56**
49									**.42**
50									**.44**
51									**.28**
52									**.37**
53									**.71**

Note. To maintain simplicity in the table, factor loading values below 0.45 are not shown.

Eight dimensions emerged from the parallel analysis (see Table 2). Six dimensions identified in the interview results were confirmed: Internet Positive Coping Ability, Internet Curiosity, Internet Socialization Ability, Internet Learning Ability, Internet Self-Control Ability, and Internet Self-Efficacy. However, the EFA results indicated that the "Internet Information Ability" dimension from the interview should be split into two distinct dimensions: "Internet Information Search Ability" and "Internet Information Protection Ability" ($r = .54$). As a result, a final set of eight dimensions, comprising 39 items, was confirmed and retained for the AIAS (see Table 3). Compared to the initial item pool, 14 items were removed due to poor quality.

Table 3. *Changes in Dimensions After EFA.*

Dimension	Definition	Item source	Items
Internet curiosity	The extent to which adolescents can remain curious about the Internet.	Interview + EFA	8–12
Internet self-efficacy	The extent to which adolescents are confident in their ability to use the Internet.	Interview + EFA	32–36
Internet self-control ability	The extent to which adolescents can control their Internet use.	Interview + EFA	27–31
Internet information search ability	On the Internet, adolescents can search for exactly the information they want.	EFA	38–40
Internet information protection ability	The extent to which adolescents can protect their personal information on the Internet.	EFA	42–45
Internet socialization ability	The extent to which adolescents can actively participate in Internet socialization and tolerance of others.	Interview + EFA	15–21
Internet learning ability	The extent to which adolescents can actively learn about the Internet.	Interview + EFA	22–25
Internet positive coping ability	The extent to which adolescents can respond positively to the frustrations they face online.	Interview + EFA	1–6

Confirmatory Factor Analysis

The CFA results indicated that the scale model fit met the acceptable criteria, with $\chi^2 = 10{,}751$, $df = 712$, $p < .001$, CFI = .92, TLI = .92, SRMR = .04, RMSEA = .05, 90% CI = [.05, .06]. The standardized factor loadings for all items ranged from .58 to .90, and the correlations between dimensions ranged from .32 to .73 (see Table 4).

Table 4. *Correlations Between Dimensions (n = 4,637).*

	1	2	3	4	5	6	7	8
1 Internet self-control ability	—							
2 Internet socialization ability	.44***	—						
3 Internet information search ability	.48***	.42***	—					
4 Internet information protection ability	.43***	.45***	.56***	—				
5 Internet positive coping ability	.37***	.56***	.50***	.48***	—			
6 Internet learning ability	.45***	.38***	.71***	.48***	.45***	—		
7 Internet self-efficacy	.39***	.47***	.53***	.73***	.52***	.45***	—	
8 Internet curiosity	.32***	.52***	.52***	.67***	.51***	.41***	.73***	—

Note. *$p < .05$, **$p < .01$, ***$p < .001$.

Reliability Assessment

In this study, we evaluated the Cronbach's alpha coefficient, composite reliability, and test-retest reliability of the scale. We also refined the operational definitions of each dimension based on the existing item content. Table 5 shows the scale's good reliability.

Table 5. *Reliability and Operability Definitions for Scale and Each Dimension (n = 4,637).*

	M	*SD*	α	Composite reliability	Retest reliability[a]
Adolescent Internet Adaptability	4.13	0.82	.96	.96	.75
Internet Self-control Ability	3.94	1.09	.84	.84	.83
Internet Socialization Ability	3.87	1.08	.86	.86	.74
Internet Information search Ability	4.08	1.16	.81	.82	.72
Internet Information Protection Ability	4.40	1.11	.79	.80	.81
Internet Positive Coping Ability	4.53	1.08	.95	.95	.77
Internet Learning Ability	4.06	1.07	.88	.89	.81
Internet Self-efficacy	3.98	1.13	.92	.92	.75
Internet Curiosity	4.11	1.05	.89	.89	.69

Note. M is mean, *SD* is standard deviation, α is Cronbach's alpha. [a] The sample size for retest reliability was 132.

Validity Assessment

Structural Validity

The CFA results demonstrated that the scale has good structural validity, with χ^2 = 10,751, *df* = 712, *p* < .001, CFI = .92, TLI = .92, SRMR = .04, RMSEA = .05, 90% CI = [.05, .06]. The factor loadings from the CFA are shown in Table 6.

Table 6. *The Factor Loadings of CFA.*

Factor	Items	SE	95% Confidence Interval		Z	p	Std-λ
			Lower	Upper			
	A1	0.02	0.80	0.87	44.08	<.001	.63
	A2	0.02	0.96	1.03	52.82	<.001	.72
Internet Self-control Ability	A3	0.02	1.08	1.16	58.34	<.001	.77
	A4	0.02	0.92	1.00	52.25	<.001	.71
	A5	0.02	1.07	1.15	59.35	<.001	.78
	A6	0.02	0.88	0.97	40.59	<.001	.58
	A7	0.02	0.91	1.00	42.66	<.001	.61
	A8	0.02	1.00	1.08	50.56	<.001	.69
Internet Socialization Ability	A9	0.02	1.10	1.17	59.19	<.001	.77
	A10	0.02	1.01	1.08	57.55	<.001	.76
	A11	0.02	0.95	1.03	49.14	<.001	.67
	A12	0.02	0.88	0.95	51.14	<.001	.70
	A13	0.02	0.89	0.97	45.58	<.001	.64
Internet Information Search Ability	A14	0.02	1.11	1.17	65.23	<.001	.83
	A15	0.02	1.06	1.13	68.16	<.001	.86
	A16	0.02	0.82	0.91	39.03	<.001	.56
Internet Information Protection Ability	A17	0.02	0.99	1.07	51.66	<.001	.71
	A18	0.02	1.02	1.09	58.72	<.001	.78
	A19	0.02	0.97	1.03	56.73	<.001	.76
	A20	0.01	1.03	1.08	74.31	<.001	.87
	A21	0.01	1.06	1.11	77.22	<.001	.89
Internet Positive Coping Ability	A22	0.01	1.05	1.10	75.65	<.001	.88
	A23	0.01	1.04	1.10	78.32	<.001	.90
	A24	0.01	1.03	1.08	77.02	<.001	.89
	A25	0.02	0.94	1.00	60.43	<.001	.76
	A26	0.02	0.84	0.91	49.46	<.001	.67
Internet Learning Ability	A27	0.02	1.00	1.06	65.93	<.001	.82
	A28	0.01	1.03	1.09	75.42	<.001	.89
	A29	0.01	0.99	1.05	70.89	<.001	.86
	A30	0.02	1.06	1.12	70.12	<.001	.84
	A31	0.02	1.10	1.16	74.69	<.001	.88
Internet Self-efficacy	A32	0.02	1.07	1.13	73.19	<.001	.87
	A33	0.02	1.04	1.11	65.83	<.001	.81
	A34	0.02	1.01	1.07	65.80	<.001	.81
	A35	0.02	0.95	1.01	63.18	<.001	.79
	A36	0.02	0.83	0.90	47.32	<.001	.64
Internet Curiosity	A37	0.02	0.92	0.98	62.59	<.001	.79
	A38	0.02	1.05	1.11	71.84	<.001	.86
	A39	0.02	1.03	1.09	71.21	<.001	.86

Discriminant Validity and Convergent Validity

As shown in Table 7, the AVE values for all dimensions were above 0.36, indicating that the AIAS achieved adequate convergent validity. Additionally, the HTMT ratios between dimensions were all below 0.85, demonstrating good discriminant validity of the scale.

Table 7. *HTMT Ratio and AVE for Scale (n = 4,637).*

	1	2	3	4	5	6	7	8
1 Internet Self-control Ability	*.52*							
2 Internet Socialization Ability	.52	*.46*						
3 Internet Information search Ability	.45	.68	*.60*					
4 Internet Information Protection Ability	.56	.46	.56	*.48*				
5 Internet Positive Coping Ability	.54	.47	.57	.83	*.74*			
6 Internet Learning Ability	.49	.52	.57	.56	.60	*.64*		
7 Internet Self-efficacy	.44	.54	.61	.53	.57	.80	*.70*	
8 Internet Curiosity	.36	.60	.60	.48	.56	.75	.80	*.61*

Note. The italicized values on the diagonal are the AVE values for the corresponding dimension.

Measurement Invariance

Compared to the baseline model, the metric invariance model had ΔCFI = .006 and ΔRMSEA = .002, demonstrating that the AIAS exhibits measurement invariance across gender (see Table 8).

Table 8. *Measurement Invariance Test for Gender (n = 4,637).*

	χ^2	df	p	CFI	TLI	RMSEA	SRMR
Baseline model	10750.65	712	—	.923	.915	.055	.04
Configural invariance	12228.84	1424	< .001	.918	.910	.057	.04
Metric invariance	12277.82	1456	< .001	.917	.912	.057	.04
Scalar invariance	12474.49	1488	< .001	.916	.912	.056	.04
Strict invariance	13919.58	1520	< .001	.905	.904	.059	.04

Similarly, when comparing the baseline model with the metric invariance model for educational stages, we found ΔCFI < .001 and ΔRMSEA = .002, indicating that the AIAS also exhibits measurement invariance across educational stages (see Table 9).

Table 9. *Measurement Invariance Test for Educational Stages (n = 4,637).*

	χ^2	df	p	CFI	TLI	RMSEA	SRMR
Baseline model	135153.35	2223	—	.923	.915	.055	.04
Configural invariance	12211.23	2022	< .001	.923	.916	.057	.04
Metric invariance	12353.91	2084	< .001	.923	.918	.056	.04
Scalar invariance	12913.99	2146	< .001	.919	.916	.057	.04
Strict invariance	23620.03	2224	< .001	.839	.839	.079	.05

Note. Educational stages include middle school, high school and college.

Criterion-Related Validity

In this section, we assessed the criterion-related validity of the scale. As shown in Table 10, adolescent Internet adaptability was significantly correlated with Internet use—parental active help, subjective well-being, meaning in life, depression, and Internet addiction. These results suggest that the scale demonstrates adequate criterion-related validity.

Table 10. *The Criterion-related Validity of Scale (n = 4,637).*

	1	2	3	4	5	6
1 Adolescent Internet Adaptability	—					
2 Internet use—parental active help	.33***	—				
3 Subjective well-being	.21***	.25***	—			
4 Meaning in life	.49***	.36***	.25***	—		
5 Internet addiction	−.16***	−.04**	−.10***	−.24***	—	
6 Depression	−.12***	−.09***	−.14***	−.19***	.42***	—
M	4.12	2.45	2.49	4.79	2.35	1.95
SD	0.82	0.83	0.96	1.10	0.85	0.88

Note. *M* is mean, *SD* is standard deviation, $^*p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Short Version of AIAS

To reduce participant burden, improve data quality, and enhance broader applicability, we retained the two items with the highest factor loadings from each dimension, resulting in a short version of the AIAS consisting of 16 items. Table 11 displays the reliability metrics for the short version of the AIAS and its correlation with the full AIAS version. The reliability coefficients for all eight dimensions of the short version exceed .70. Moreover, the correlations between the dimensions and total scores of the short version and the full version exceed .87, indicating a high degree of representativeness.

Table 11. *Reliability and Pearson's Correlation for the Short Version of AIAS (n = 4,637).*

	α	Composite reliability	Correlation coefficient with full version
1 Internet Self-control Ability	.79	.80	.90
2 Internet Socialization Ability	.74	.75	.87
3 Internet Information search Ability	.84	.85	.94
4 Internet Information Protection Ability	.73	.74	.89
5 Internet Positive Coping Ability	.90	.90	.95
6 Internet Learning Ability	.87	.87	.92
7 Internet Self-efficacy	.87	.87	.94
8 Internet Curiosity	.80	.80	.93
total	.91	.95	.99

Note. Confirmatory factor analysis (CFA) confirmed the construct validity of the short version of the AIAS, with the following results: $\chi^2 (76) = 501.97$, $p < .001$, CFI = .99, TLI = .98, SRMR = .02, RMSEA = .04, 90% CI [.03, .04].

Discussion

Understanding how adolescents adapt to the Internet environment is crucial, given its significant role in adolescent development today. However, many adolescents struggle with this adaptation, facing challenges such as Internet addiction (Chung et al., 2019), privacy and safety concerns (Zhang et al., 2021), and cyberbullying (Kokka et al., 2021)—all of which pose risks to their well-being. As a result, there is an urgent need for a comprehensive understanding of the attributes and factors that enable adolescents to adapt positively to Internet use. While previous studies have explored specific aspects of adolescent Internet behavior (Lopez-Fernandez et al., 2013; Tynes et al., 2010), a holistic measure of adaptive capacities across various Internet activities is still lacking. This study addresses this gap by developing and validating the AIAS, a comprehensive assessment of adolescents' ability to navigate the digital world effectively.

The Eight Dimensions of the AIAS

The AIAS encompasses eight dimensions: Internet curiosity, self-efficacy, self-control, information search and protection abilities, socialization, learning ability, and positive coping. These dimensions align with key themes in recent research on adolescents' digital engagement.

Curiosity and learning ability are foundational to digital fluency, driving adolescents to explore and acquire knowledge that enhances their adaptability in online environments (Ardito, 2022; Granic et al., 2020). Self-efficacy, closely linked to these aspects, empowers youth to confidently navigate and utilize digital tools, which is essential for success in the increasingly complex digital landscape (Stavropoulos et al., 2022).

The ability to search for accurate information and protect personal data reflects the broader concept of social media information literacy (SMIL), emphasizing the need for technical, informational, and privacy-related competencies. These skills are crucial for managing the vast and often unregulated content encountered online (Heiss et al., 2023; Purington Drake et al., 2023).

Socialization and self-control emphasize the importance of responsible digital citizenship and the management of online behaviors. Effective social interaction and self-regulation are essential for maintaining a balanced digital presence and mitigating risks such as overuse and exposure to harmful content (Gui & Büchi, 2021; Stavropoulos et al., 2022).

Finally, the dimension of positive coping ability addresses the need for resilience in the face of online challenges, aligning with the growing focus on digital well-being. This includes the capacity to manage negative experiences and maintain a healthy relationship with digital media (Vanden Abeele, 2021).

In summary, these eight dimensions provide a structured framework for understanding and enhancing Internet adaptability, which is crucial for supporting digital literacy, well-being, and safe online practices, particularly among adolescents. This framework can inform the development of educational interventions that are both interactive and experiential.

Psychometric Properties of the AIAS

Our analyses demonstrate strong reliability, validity, and theoretical support for the AIAS. The results revealed good internal consistency and cross-time consistency for both the overall scale and each individual factor. Construct validity was supported by a good fit in the Confirmatory Factor Analysis (CFA), along with evidence of discriminant and convergent validity. Furthermore, the AIAS exhibited measurement invariance across both gender and educational stages, indicating its robustness as a tool for assessing Internet adaptability in a diverse adolescent population, regardless of gender or educational level.

The pattern of correlations provides initial evidence for the criterion-related validity of the newly developed AIAS. As hypothesized, the scale showed statistically significant, small to moderate positive correlations with Internet use—parental active help, subjective well-being, and meaning in life. Additionally, small but significant negative correlations were found between the scale and Internet addiction and depression.

Notably, the scale's stronger associations with positive indicators, such as parental support and meaning in life, compared to negative factors, suggest that it may tap into a dimension of adolescent Internet adaptation that is underpinned by positive psychological functioning, such as social connection and purpose. This finding highlights the potential of the Internet not only as a context for risk behaviors but also as an environment where adolescents can acquire strengths and thrive (Strom & Strom, 2014). These positive psychology elements could inform strength-based interventions and programs aimed at promoting healthy adaptation and development in adolescents in the digital age.

Moreover, the theoretical framework of this study is rooted in Piaget's theory of cognitive development, which posits that individuals actively adapt to their environment as a fundamental aspect of cognitive growth (Piaget, 1971). Our research affirms and extends this theory to the online environment, demonstrating the adaptive capacities of adolescents in their engagement with the Internet. The AIAS developed in this study not only advances our understanding of how adolescents actively adapt to the complexities of the online environment, contributing to the ongoing discourse within the framework of cognitive developmental theories, but also serves as an effective tool for future studies aimed at assessing Internet adaptation among adolescents in various contexts.

Contribution

Theoretical Contribution

The AIAS makes a significant theoretical contribution to the understanding of adolescent internet behavior. Unlike traditional media literacy frameworks, which primarily focus on adolescents' ability to critically engage with online content, the AIAS adopts a psychological perspective grounded in Piaget's theory of cognitive development, specifically his concept of adaptation. Piaget (1971) proposed that adolescents actively adjust their cognitive structures to engage effectively with their environments. Building on this framework, the AIAS emphasizes not only adolescents' critical media skills but also their adaptive capacities—how they navigate the online environment in ways that foster personal growth, resilience, and positive coping.

Practical Contribution

From a practical perspective, the AIAS offers valuable benefits for various stakeholders, including educators, parents, and adolescents themselves. By assessing the positive capabilities adolescents develop through Internet use, the scale provides insights that go beyond identifying problematic behaviors. For educators, the AIAS can inform the design of targeted digital literacy programs that focus not only on mitigating risks such as cyberbullying and addiction but also on nurturing strengths like curiosity, resilience, and self-efficacy (Vanden Abeele, 2021).

For parents, the scale offers useful information to guide their support strategies, helping them understand their children's strengths and weaknesses in adapting to the digital environment. By identifying areas where adolescents may need additional support—such as self-control or positive coping skills—parents can tailor their guidance to foster healthier internet habits. Moreover, the scale can be used to track changes in internet adaptability over time, providing insights into the effectiveness of parental interventions.

For adolescents, taking the AIAS presents an opportunity for self-reflection. By identifying their strengths in areas like information protection and learning ability, they can gain confidence in their capacity to navigate the digital world safely and productively. The scale also encourages adolescents to reflect on their coping strategies and areas for improvement, promoting self-regulation and fostering a more balanced relationship with digital technology.

Limitations and Further Work

Although this study makes an important contribution, several limitations and areas for further development remain. First, while the dimensions identified by W. Wang et al. (2021) provided a valuable theoretical foundation, we recognized potential conceptual overlaps, particularly between Internet sense of control and Internet self-control. In developing the scale, we addressed these overlaps through rigorous item analysis and factor reduction, resulting in a refined set of distinct dimensions. However, this overlap should be considered when interpreting the findings, and future research may further explore these constructs to enhance their distinctiveness.

Second, as a newly developed scale, the AIAS requires ongoing evaluation and refinement to fully realize its potential. Additional validation across diverse cultural contexts and adolescent populations is needed. Discrepancies between self-reported and behavioral data may also arise, highlighting areas for further improvement. While some degree of self-report bias is inherent, the inclusion of Internet activity data could help address this limitation. Moreover, the long-term implications of AIAS scores, as well as the effects of scale-informed interventions on adolescents' adaptive abilities and well-being, remain to be determined. These issues should be explored through longitudinal studies.

Third, with its strong validity and reliability, the AIAS holds promise for future research aimed at fostering the positive development and well-being of adolescents in the digital age. We encourage researchers and practitioners to embrace and apply the AIAS in a collaborative effort that transcends disciplinary boundaries. The scale can serve as a catalyst for a collective understanding of how adolescents can not only adapt to but also thrive in the digital age. As we embark on this transformative journey, we anticipate that the AIAS will evolve from a diagnostic tool to a cornerstone for developing preventive and supportive strategies that highlight the positive dimensions of adolescent Internet use.

Conclusion

The AIAS holds promise as a tool for identifying adolescents' strengths and needs in adapting to Internet use, enabling tailored support from a positive psychology perspective. The scale's stronger associations with indicators of well-being and meaning in life, as opposed to problematic Internet use, suggest that it captures adaptive capacities grounded in positive functioning. This allows educators and parents to assess adolescents holistically across various online domains and develop targeted interventions that promote strengths such as healthy social connections and a sense of purpose in the digital world (Stavropoulos et al., 2022). Similarly, the scale provides researchers with a comprehensive measure of adolescents' Internet adaptability, specifically in relation to thriving and flourishing, thereby advancing our understanding of positive youth development in the digital age. The Adolescent Internet Adaptability Scale may also serve as both a clinical and research tool, offering a concise self-report index focused on fostering positive Internet use capacities and outcomes.

Conflict of Interest

The authors have no conflicts of interest to declare.

Authors' Contribution

Weijun Wang: Writing - Review & Editing, Project administration. **Jianmei Ye**: Writing - original draft. **Rouchun Dong**: Writing - Review & Editing. **Shihao Ma**: Writing - Review & Editing. **David Huang**: Conceptualization, Writing - Review & Editing. **Xin Zhao**: Conceptualization, Writing - Review & Editing.

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All data generated or used during the study are available from the corresponding author by request.

Use of AI Services

The authors declare that they have used AI services, for grammar correction and minor style refinements, specifically for text of the manuscript and English items of the AIAS. The authors carefully reviewed all suggestions from these services to ensure the original meaning and factual accuracy were preserved.

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Appendix

Adolescent Internet Adaptability Scale (Formal Version)

Instruction

Below is a list of potential behavioral characteristics that people may exhibit when using the Internet. There are no right or wrong answers. Please select the option that most closely aligns with your actual experience.

1. I effectively use the Internet to improve my daily life.

2. I have made meaningful connections with like-minded people online.

3. When my friends can't find the information they need online, they often turn to me for help.

4. I use different passwords for my various online accounts.

5. When I encounter difficulties online, I manage my emotions and adapt to the situation.

6. Online learning has become a regular part of my routine.

7. I believe I can quickly master new Internet technologies.

8. I get excited when I learn about new Internet technologies.

9. When I am online or using my phone, I usually have a clear purpose.

10. In the online communities I belong to, I actively participate in discussions and share my ideas.

11. I know how to find interesting content—whether it's articles, images, or videos—online.

12. I avoid connecting to unprotected public Wi-Fi networks.

13. When I face challenges online, I take a step back and reduce my stress.

14. I enjoy learning proactively on the Internet.

15. I am confident I can acquire Internet skills commonly mastered by people around me.

16. I am often curious about strangers and new experiences online.

17. My Internet usage is highly regulated.

18. Making friends online has broadened my perspective.

19. I can usually find the exact information I'm looking for on the Internet.

20. I avoid clicking on unfamiliar links without caution.

21. When I encounter online challenges, I try to look at the situation from a different perspective.

22. I use online resources to improve my skills and abilities.

23. I am confident in my ability to navigate basic Internet functions.

24. I am open to exploring new things on the Internet.

25. I view the Internet primarily as a tool to meet my needs.

26. I am open to discussing differing opinions online, as long as the conversation remains respectful.

27. When posting on platforms like Weibo, QQ Space, or Facebook, I take care to remove any personal details from photos or text.

28. When facing online challenges, I rely on past experiences—mine or others'—to find solutions.

29. I use the Internet to solve academic challenges I face.

30. I am confident in my ability to create my own content on the Internet.

31. I enjoy exploring new and unfamiliar features on the Internet.

32. I plan my Internet usage carefully and strategically.

33. I enjoy reading comments from other users and often learn something new from them.

34. When faced with challenges online, I actively work to improve the situation.

35. I am confident that I can help others solve problems they encounter on the Internet.

36. When encountering new online tools or platforms, I take the initiative to learn how to use them.

37. As long as it does not violate public morals, I wish there were more diverse ideas online.

38. When I face difficulties online, I make a plan to address them.

39. As long as it aligns with public morals, I believe there should be more diverse viewpoints on the Internet.

Scoring Range

1	2	3	4	5	6
Not like me at all	Mostly not like me	Somewhat not like me	Somewhat like me	Mostly like me	Exactly like me

Dimensions With Corresponding Items

Internet Self-control Ability: 1, 9, 17, 25, 32.

Internet Socialization Ability: 2, 10, 18, 26, 33, 37, 39.

Internet Information Search Ability: 3, 11, 19.

Internet Information Protection Ability: 4, 12, 20, 27.

Internet Positive Coping Ability: 5, 13, 21, 28, 34, 38.

Internet Learning Ability: 6, 14, 22, 29.

Internet Self-efficacy: 7, 15, 23, 30, 35

Internet Curiosity: 8, 16, 24, 31, 36.

Chinese Version

青少年网络适应性量表（正式版）

指导语： 以下是人们在使用互联网的时候可能出现的行为特征。没有正确或错误的答案，请选择最适合您实际情况的答案。

1. 我可以很好的利用网络来服务于我生活。

2. 我在网上认识了更多志同道合的朋友。

3. 身边的朋友在网上搜不到自己想要的信息时，会向我求助。

4. 我会使用不同的密码管理不同的账户。

5. 在网络中遇到困难时，我会调整好自己的情绪去接受它。

6. 在网上学习知识已经成为了我的习惯。

7. 我相信自己能在较短的时间内掌握最新的网络技术。

8. 学会一门新的网络技术常常使我感到兴奋。

9. 上网或者玩手机的时候，我通常都有明确的目的。

10. **在我喜**欢的群里面，我会很积极的参与交流，表达自己的想法。

11. **感兴趣**的文字，图片或者视频，我都有方法在网上搜到。

12. **我不会**轻易连接那种没有密码的公共WiFi。

13. **在网络**中遇到困难时，我会放松自己的心情，去排解它的压力。

14. **我喜**欢在网上主动学习。

15. **我身**边的大多数人能掌握的网络技能，我自信能很快掌握。

16. 网络中那些陌生的人和事常常让我感到很好奇。

17. **我的上网**时间非常有规律。

18. **网上交友拓**宽了我的视野。

19. **在网上，我通常可以准确地搜索到自己想要的信息。**

20. **我不会随意点开未知**链接。

21. **在网络**中遇到困难时，我会尝试换一个视角去看待。

22. **我会利用网上的学**习资源提升自己的能力。

23. **我有自信我可以非常熟**练使用网络上的基本功能。

24. **我不会排斥网络**上的新事物。

25. 网络对我来说就是一个工具。

26. **如果没有触及底**线，那我很乐意和观点不同的网友讨论问题。

27. **在发微博、玩QQ空**间或者Facebook的时候，我会注意抹去和个人信息有关的图片或者文字。

28. **在网络**中遇到困难时，我会吸取别人或自己先前的经验，以求解决问题。

29. **我会利用网络**解决自己在学习上遇到的问题。

30. **我有信心可以在网络**中创造属于自己的作品。

31. 对于网络中的事物，我喜欢去探索我不熟悉的功能。

32. **我会有**计划的安排自己的上网时间。

33. **我喜**欢读网友们的评论，觉得能学到很多。

34. **在网络**中遇到困难时，我会努力去改变现状，使情况向好的一面转化。

35. **当别**的同学上网遇到问题时，我有自信我能帮到他。

36. **面**对新的网络场景或者软件时，我会积极搜索更多的信息来使用它。

37. **只要没有危害**别人，网络中不同喜好的言论我都能接受。

38. **在网络**中遇到困难时，我会定一个解决方案。

39. **在不**违背公序良俗的前提下，我希望网络上可以多一些不同的想法。

计分方式：

1	2	3	4	5	6
完全不像我	大部分不像我	有点不像我	有点像我	大部分像我	完全就是我

维度与相应的项目：

网络**自我控制**能力：1, 9, 17, 25, 32。

网络**社交**能力：2, 10, 18, 26, 33, 37, 39。

网络**信息搜索**能力：3, 11, 19。

网络**信息保**护能力：4, 12, 20, 27。

网络积极应对能力: 5, 13, 21, 28, 34, 38。

网络**学习**能力: 6, 14, 22, 29。

网络**自我效能感**: 7, 15, 23, 30, 35。

网络**好奇心**: 8, 16, 24, 31, 36。

Adolescent Internet Adaptability Scale (Short Version)

Internet Self-control Ability

1. My internet usage is highly regulated.
2. I plan my internet usage carefully and strategically.

Internet Socialization Ability

3. As long as it does not violate public morals, I wish there were more diverse ideas online.
4. I enjoy reading comments from other users and often learn something new from them.

Internet Information Search Ability

5. I know how to find interesting content—whether it's articles, images, or videos—online.
6. I can usually find the exact information I'm looking for on the internet.

Internet Information Protection Ability

7. I avoid clicking on unfamiliar links without caution.
8. When posting on platforms like Weibo, QQ Space, or Facebook, I take care to remove any personal details from photos or text.

Internet Positive Coping Ability

9. When I face challenges online, I take a step back and reduce my stress.
10. When facing online challenges, I rely on past experiences—mine or others'—to find solutions.

Internet Learning Ability

11. I use online resources to improve my skills and abilities.
12. I use the internet to solve academic challenges I face.

Internet Self-efficacy

13. I am confident I can acquire internet skills commonly mastered by people around me.
14. I am confident in my ability to navigate basic internet functions.

Internet Curiosity

15. I enjoy exploring new and unfamiliar features on the internet.
16. When encountering new online tools or platforms, I take the initiative to learn how to use them.

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