

Assessing sleep problems and daytime functioning: a translation, adaption, and validation of the Athens Insomnia Scale for non-clinical application (AIS-NCA)

Sebastian Sattler, Daniel Seddig, Giulia Zerbini

Angaben zur Veröffentlichung / Publication details:

Sattler, Sebastian, Daniel Seddig, and Giulia Zerbini. 2023. "Assessing sleep problems and daytime functioning: a translation, adaption, and validation of the Athens Insomnia Scale for non-clinical application (AIS-NCA)." *Psychology & Health* 38 (8): 1006–31.
<https://doi.org/10.1080/08870446.2021.1998498>.

Supplementary Information for

“Assessing Sleep Problems and Daytime Functioning: A Translation, Adaption, and Validation of the Athens Insomnia Scale for Non-Clinical Application (AIS-NCA)”

Sebastian Sattler^{a,b,c,*}, Daniel Seddig^a, Giulia Zerbini^{d,*}

Affiliations

^a Institute of Sociology and Social Psychology, University of Cologne, Cologne, Germany

^b Pragmatic Health Ethics Research Unit, Institut de recherches cliniques de Montréal, Montréal, Canada

^c Faculty of Sociology, Bielefeld University, Bielefeld, Germany

^d Department of Medical Psychology and Sociology, Medical Faculty, Augsburg University, Augsburg, Germany

** Corresponding authors*

Contacts

sebastian.sattler@uni-bielefeld.de, giulia.zerbini@med.uni-augsburg.de

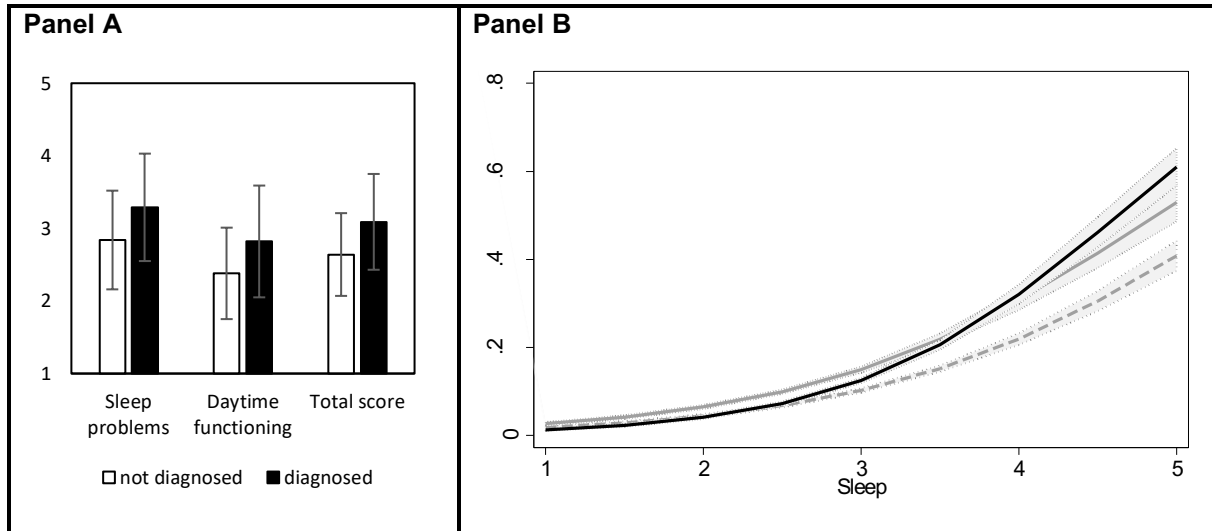
Figure S1. The AIS-NCA in German (Panel A) and English (Panel B).

Panel A					
Wie bewerten Sie die folgenden Dinge, die mit Ihrem Schlaf zusammenhängen? Beziehen Sie sich bitte auf die letzten [12 Monate/4 Wochen].^a					
1) Einschlafen konnte ich meist (nach dem Ausschalten des Lichts)...	<i>sofort</i>	<i>nach sehr kurzer Zeit</i>	<i>nach kurzer Zeit</i>	<i>nach längerer Zeit</i>	<i>nach sehr langer Zeit</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Dass ich während des Schlafens aufwache, passiert...	<i>nie</i>	<i>fast nie</i>	<i>manchmal</i>	<i>ziemlich oft</i>	<i>sehr oft</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Endgültig früher aufgewacht als gewünscht bin ich...	<i>nie</i>	<i>fast nie</i>	<i>manchmal</i>	<i>ziemlich oft</i>	<i>sehr oft</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Meine Schlafqualität war insgesamt meist...	<i>sehr gut</i>	<i>gut</i>	<i>teils gut/teils schlecht</i>	<i>schlecht</i>	<i>sehr schlecht</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Mein Wohlbefinden war tagsüber meist...	<i>sehr gut</i>	<i>gut</i>	<i>teils gut/teils schlecht</i>	<i>schlecht</i>	<i>sehr schlecht</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) Meine Leistungsfähigkeit (physisch und psychisch) war tagsüber meist...	<i>sehr gut</i>	<i>gut</i>	<i>teils gut/teils schlecht</i>	<i>schlecht</i>	<i>sehr schlecht</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) Meine Müdigkeit war tagsüber meist...	<i>nicht spürbar</i>	<i>kaum spürbar</i>	<i>mäßig spürbar</i>	<i>stark spürbar</i>	<i>sehr stark spürbar</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Panel B					
How do you rate the following aspects relating to your sleep? Please base your answers on the [12 months/past four weeks].^a					
1) I could usually get to sleep (after turning off the lights)...	<i>immediately</i>	<i>after a very short time</i>	<i>after a short time</i>	<i>after a longer time</i>	<i>after a very long time</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Waking up during my sleep happened...	<i>never</i>	<i>almost never</i>	<i>sometimes</i>	<i>quite often</i>	<i>very often</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Waking up prematurely happened...	<i>never</i>	<i>almost never</i>	<i>sometimes</i>	<i>quite often</i>	<i>very often</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) The overall quality of my sleep was usually...	<i>very good</i>	<i>good</i>	<i>sometimes good/ sometimes bad</i>	<i>bad</i>	<i>very bad</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Throughout the day, my level of well-being was usually...	<i>very good</i>	<i>good</i>	<i>sometimes good/ sometimes bad</i>	<i>bad</i>	<i>very bad</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) Throughout the day, my level of (physical and mental) performance was usually...	<i>very good</i>	<i>good</i>	<i>sometimes good/ sometimes bad</i>	<i>bad</i>	<i>very bad</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) Throughout the day, my level of tiredness was usually...	<i>not perceptible</i>	<i>hardly perceptible</i>	<i>moderately perceptible</i>	<i>very perceptible</i>	<i>very strongly perceptible</i>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Notes: ^aDifferent reference periods might be entered.

Figure S2. Panel A shows the mean scores (with standard deviations) of the subscales for sleep problems and daytime function as well as the total score by sleep disorder diagnosis (at t_2), while Panel B shows the predicted values (with 95% confidence intervals) for new sleep disorder diagnosis between t_1 and t_2 ($N=14,797$).



Notes: In Panel A, white bars (\square) represent that respondents indicated being not diagnosed with a sleep disorder while black bars (\blacksquare) represent that respondents indicated being diagnosed with a sleep disorder. In Panel B, grey dashed lines (---) refer to sleep problems, grey solid lines (—) daytime functioning, and black solid lines (—) the total score.

Table S1. Items and descriptives of the AIS-NCA assessed in Study 2 ($N_{Study\ 2}=14,797$).^a

#	Item and response options	Descriptives					
		M	SD	Min	Max	Skew	Kurt
1	I could usually get to sleep (after turning off the lights)... <i>immediately; after a very short time; after a short time; after a long time; after a very long time</i>	2.66	0.97	1.00	5.00	0.23	-0.50
2	Waking up during my sleep happened... <i>never; almost never; sometimes; quite often; very often</i>	3.36	0.96	1.00	5.00	0.01	-0.57
3	Waking up prematurely happened... <i>never; almost never; sometimes; quite often; very often</i>	2.91	0.98	1.00	5.00	0.28	-0.36
4	The overall quality of my sleep was usually... <i>very good; good; sometimes good/sometimes bad; bad; very bad</i>	2.59	0.87	1.00	5.00	0.50	0.13
5	Throughout the day, my level of well-being was usually... <i>very good; good; sometimes good/sometimes bad; bad; very bad</i>	2.37	0.70	1.00	5.00	0.60	0.69
6	Throughout the day, my level of (physical and mental) performance was usually... <i>very good; good; sometimes good/sometimes bad; bad; very bad</i>	2.34	0.71	1.00	5.00	0.73	1.06
7	Throughout the day, my level of tiredness was usually... <i>not perceptible; hardly perceptible; moderately perceptible; very perceptible; very strongly perceptible</i>	2.59	0.83	1.00	5.00	0.19	0.00
	AIS-NCA: Sleep problems	2.88	0.71	1.00	5.00	0.29	-0.16
	AIS-NCA: Daytime functioning	2.43	0.66	1.00	5.00	0.58	0.70
	AIS-NCA: Total score	2.69	0.60	1.00	5.00	0.41	0.14

Notes: ^aPlease find the German version used in Study 2 in Panel A in Figure S1. The question was, “How do you rate the following aspects related to your sleep? Please base your answers on the past twelve months.” [„Wie bewerten Sie die folgenden Dinge, die mit Ihrem Schlaf zusammenhängen? Beziehen Sie sich bitte auf die letzten 12 Monate.“]. M=Mean, SD=Standard deviation, Min=Minimum, Max=Maximum, Skew=Skewness, Kurt=Excess kurtosis.

Table S2. Items and descriptives of the AIS-NCA assessed in Study 3 ($N_{Study\ 3}=78$).^a

#	Item and response options	Time (t)	Descriptives					
			M	SD	Min	Max	Skew	Kurt
1	I could usually get to sleep (after turning off the lights)... <i>immediately; after a very short time; after a short time; after a long time; after a very long time</i>	t_1	2.74	1.23	2.94	1.01	-0.02	-0.52
		t_2	2.63	1.11	2.85	0.99	-0.01	-0.49
2	Waking up during my sleep happened... <i>never; almost never; sometimes; quite often; very often</i>	t_1	2.74	0.90	2.74	1.00	0.37	-0.04
		t_2	2.85	0.99	2.71	1.02	0.47	-0.17
3	Waking up prematurely happened... <i>never; almost never; sometimes; quite often; very often</i>	t_1	2.52	0.94	2.68	1.01	0.30	-0.50
		t_2	2.30	0.91	2.64	0.95	0.68	0.14
4	The overall quality of my sleep was usually... <i>very good; good; sometimes good/sometimes bad; bad; very bad</i>	t_1	1.93	0.83	2.45	0.89	0.54	0.38
		t_2	2.07	0.73	2.31	0.87	0.78	0.98
5	Throughout the day, my level of well-being was usually... <i>very good; good; sometimes good/sometimes bad; bad; very bad</i>	t_1	2.00	0.73	2.41	0.86	0.47	0.12
		t_2	2.33	0.88	2.42	0.76	0.52	0.76
6	Throughout the day, my level of (physical and mental) performance was usually... <i>very good; good; sometimes good/sometimes bad; bad; very bad</i>	t_1	2.22	0.93	2.64	0.76	0.15	-0.50
		t_2	2.33	0.83	2.65	0.75	0.29	0.35
7	Throughout the day, my level of tiredness was usually... <i>not perceptible; hardly perceptible; moderately perceptible; very perceptible; very strongly perceptible</i>	t_1	2.41	0.80	2.79	0.71	-0.13	1.02
		t_2	2.44	0.89	2.68	0.76	-0.09	-0.36
	AIS-NCA: Sleep problems	t_1	2.48	0.71	2.70	0.75	0.48	0.41
		t_2	2.46	0.69	2.63	0.70	0.60	0.41
	AIS-NCA: Daytime functioning	t_1	2.21	0.70	2.62	0.65	-0.09	0.00
		t_2	2.37	0.81	2.59	0.67	0.23	0.44
	AIS-NCA: Total score	t_1	2.37	0.62	2.66	0.62	0.38	0.54
		t_2	2.42	0.66	2.61	0.61	0.56	1.11

Notes: ^a Please find the German version used in Study 3 in Panel A in Figure S1. The question was, “How do you rate the following aspects related to your sleep? Please base your answers on the past four weeks.” [„Wie bewerten Sie die folgenden Dinge, die mit Ihrem Schlaf zusammenhängen? Beziehen Sie sich bitte auf die letzten 4 Wochen.“]. M=Mean, SD=Standard deviation, Min=Minimum, Max=Maximum, Skew=Skewness, Kurt=Excess kurtosis.

Table S3. Items and descriptives of the AIS-NCA assessed in Study 4 ($N_{Study\ 4}=338$).^a

#	Item and response options	Descriptives					
		M	SD	Min	Max	Skew	Kurt
1	I could usually get to sleep (after turning off the lights)... <i>immediately; after a very short time; after a short time; after a long time; after a very long time</i>	2.84	1.03	1.00	5.00	0.15	-0,59
2	Waking up during my sleep happened... <i>never; almost never; sometimes; quite often; very often</i>	3.27	0.95	1.00	5.00	0.21	-0,47
3	Waking up prematurely happened... <i>never; almost never; sometimes; quite often; very often</i>	3.05	0.97	1.00	5.00	0.19	-0,39
4	The overall quality of my sleep was usually... <i>very good; good; sometimes good/sometimes bad; bad; very bad</i>	2.55	0.86	1.00	5.00	0.67	0,13
5	Throughout the day, my level of well-being was usually... <i>very good; good; sometimes good/sometimes bad; bad; very bad</i>	2.44	0.79	1.00	5.00	0.48	0,23
6	Throughout the day, my level of (physical and mental) performance was usually... <i>very good; good; sometimes good/sometimes bad; bad; very bad</i>	2.42	0.78	1.00	5.00	0.56	0,60
7	Throughout the day, my level of tiredness was usually... <i>not perceptible; hardly perceptible; moderately perceptible; very perceptible; very strongly perceptible</i>	2.73	0.91	1.00	5.00	0.35	0,02
	AIS-NCA: Sleep problems	2.93	0.72	1.25	5.00	0.35	-0,21
	AIS-NCA: Daytime functioning	2.53	0.72	1.00	5.00	0.51	0,18
	AIS-NCA: Total score	2.76	0.65	1.14	4.71	0.43	0,06

Notes: ^a Please find the German version used in Study 4 in Panel A in Figure S1. The question was, “How do you rate the following aspects related to your sleep? Please base your answers on the past four weeks.” [„Wie bewerten Sie die folgenden Dinge, die mit Ihrem Schlaf zusammenhängen? Beziehen Sie sich bitte auf die letzten 4 Wochen.“]. M=Mean, SD=Standard deviation, Min=Minimum, Max=Maximum, Skew=Skewness, Kurt=Excess kurtosis.

Detailed Ethics Statement

This research was guided by the principles formulated in the WMA Declaration of Helsinki. In Germany, no further ethics approval for social science research is required if the research issues are not regulated by law (e.g., the German Medicine Act, the Medical Devices Act, the Stem Cell Research Act, or the Medical Association's Professional Code of Conduct). The study had no such objectives, and thus no approval was required. Still, all invited students were informed on the first page of the survey about the topic of the study, the voluntariness and anonymity of their participation, and the confidentiality of their answers (e.g., that the researchers never had access to their personal data). Based on this information, respondents provided informed consent before being able to proceed.