Supplementary material for Dehnert K. et al. 2015. Total leisure noise exposure and its association with hearing loss among adolescents, International Journal of Audiology 54, 665–673.

Supplementary Figure 1. Hearing thresholds 20 dB or higher in the left ear. Raw numbers and percentages (N = 1837).

Supplementary Figure 2. Hearing thresholds 20 dB or higher in the right ear. Raw numbers and percentages (N = 1837).

Proportions of particular activities to total leisure noise

Supplementary Figure 3. Proportions of relevant activities to comprehensive leisure noise (calculated from proportions of mean values to the acceptable yearly exposure).

Supplementary Table 1. Published SPLs of leisure time activities associated with noise exposure.

<i>Activity</i>	Equivalent continuous SPLs in dB(A)	Lowest value (sensitivity analysis)	Highest value (sensitivity analysis)
Riding a moped	82 (Bistrup, 2001) (Estimation)	n.d.	n.d.
Listening to music (stationary stereos) via loudspeaker	83 (Clark, 1991, Axelsson et al, 1993)	< 80 (Clark, 1991)	85 (Clark, 1991)
Listening to music (stationary stereos) via headphones*	Median: 77	n.d.	n.d.
Listening to portable music players (PMPs) via headphones (charts, rock, pop)*	Median: 77	n.d.	n.d.
Listening to portable music players (PMPs) via headphones (oldies, jazz)*	Median: 71	n.d.	n.d.
Listening to portable music players (PMPs) via headphones (classic)*	Median: 65	n.d.	n.d.
Playing video games via headphones	84 (Plakke, 1983, Axelsson, 1996)	< 80 (Plakke, 1983)	92 (Mirbod et al., 1992)
Audio books, reports or sport programs via headphones	80**	n.d.	n.d.
Watching movies (e.g. DVDs) via headphones	80**	n.d.	n.d.
Playing an instrument	80–96, depending on type of instrument (Hohmann, 2000, Hohmann, 2010) (supplementary table 3)	n.d.	n.d.
Playing in a band or in an orchestra or singing, playing music together	95 (McIlvaine et al, 2012)	90 (Hohmann, 2000) (Orchestra)	100 (Hohmann, 2000) (Rock and jazz music)
Cinema visits	< 80 (Ferguson et al, 2000)	n.d.	80 (Warszawa and Sataloff, 2010)
Attendance at classic concerts or operas	80 (Lebo & Oliphant, 1968)**	n.d.	n.d.
Attendance at rock, pop or jazz concerts	98.5 (Derebery et al, 2012)	96 (Clark, 1991)	99 (Opperman et al., 2006)
Attendance at discotheques	100 (Twardella et al, 2008)	n.d.	n.d.
Attendance at sport events in a stadium (e.g. soccer game)	97 (Axelsson, 1996)	93 (Beach et al., 2012)	100 (Swanepoel and Hall, 2010)
Practicing ball sports in a sports hall	91 (Jiang, 1997)	80**	n.d.
Home handyman works, noisy home tools	85 (Bistrup, 2001)	80 (Bistrup, 2001)	n.d.

n.d.: No deviation from conventional value.

< 80: Values were not considered in further analysis.

*SPLs were allocated according to the participant data on their typical volume setting of PMPs. According to Hohmann (2010) 6dB were subtracted from the value listening to charts, rock, pop for the value listening to jazz/oldies and 12dB subtracted for listening to classic.

**SUVA assessment.

Supplementary Table 2. Time spent for noise-related activities classified by gender among the 2143 participants in Ohrkan.

<i>Activities</i>	Hours per week	Frequencies total			p-value*
		N (%)	Boys N (%)	Girls N (%)	
Listening to music (stationary stereos) via loudspeaker (median = 7.00)	0	248 (11.6%)	134 (13.6%)	114 (9.9%)	p < 0.01
	> 0 to ≤ 3.5	741 (34.6%)	349 (35.3%)	392 (33.9%)	
	> 3.5 to ≤ 10.5	549 (25.6%)	248 (25.1%)	301 (26.1%)	
	> 10.5	605 (28.2%)	257 (26.0%)	348 (30.1%)	
Listening to music with PMP via headphones (charts, rock, pop) (median = 7.00)	0	266 (12.4%)	163 (16.5%)	103 (8.9%)	p < 0.01
	> 0 to ≤ 3.17	593 (27.7%)	270 (27.3%)	323 (28.0%)	
	> 3.17 to ≤ 9.4	663 (30.9%)	291 (29.5%)	372 (32.2%)	
	> 9.4	621 (29.0%)	264 (26.7%)	357 (30.9%)	
Listening to music (stationary stereos) via headphones (median = 3.53)	0	1278 (59.6%)	577 (58.4%)	701 (60.7%)	p = 0.59
	> 0 to ≤ 2.0	278 (13.0%)	139 (14.1%)	139 (12.0%)	
	> 2.0 to ≤ 7	325 (15.2%)	151 (15.3%)	174 (15.1%)	
	> 7	262 (12.2%)	121 (12.2%)	141 (12.2%)	
Playing video games via headphones (median = 3.10)	0	1583 (73.9%)	589 (59.6%)	994 (86.1%)	p < 0.01
	> 0 to ≤ 1	186 (8.7%)	95 (9.6%)	91 (7.9%)	
	> 1 to ≤ 7	215 (10.0%)	165 (16.7%)	50 (4.3%)	
	> 7	159 (7.4%)	139 (14.1%)	20 (1.7%)	
Playing an instrument (median = 2.00)	0	1376 (64.2%)	658 (66.6%)	718 (62.2%)	p = 0.48
	> 0 to ≤ 1.5	276 (12.9%)	83 (8.4%)	193 (16.7%)	
	> 1.5 to ≤ 3.4	204 (9.5%)	94 (9.5%)	110 (9.5%)	
	> 3.4	287 (13.4%)	153 (15.5%)	134 (11.6%)	
Playing an additional instrument (median = 1.75)	0	1941 (90.6%)	902 (91.3%)	1039 (90.0%)	p = 0.89
	> 0 to ≤ 1	70 (3.3%)	24 (2.4%)	46 (4.0%)	
	> 1 to ≤ 2.34	67 (3.1%)	24 (2.4%)	43 (3.7%)	
	> 2.34	65 (3.0%)	38 (3.9%)	27 (2.3%)	
Practicing ball sports in a sports hall (median = 1.50)	0	859 (40.1%)	330 (33.4%)	529 (45.8%)	p < 0.01
	> 0 to ≤ 1.25	427 (19.9%)	166 (16.8%)	261 (22.6%)	
	> 1.25 to ≤ 1.9	348 (16.2%)	183 (18.5%)	165 (14.3%)	
	> 1.9	509 (23.8%)	309 (31.3%)	200 (17.3%)	
Playing in a band or in an orchestra or singing, playing music together (median = 1.50)	0	1686 (78.7%)	839 (84.9%)	847 (73.3%)	p < 0.01
	> 0 to ≤ 1	172 (8.0%)	54 (5.5%)	118 (10.2%)	
	> 1 to ≤ 2	169 (7.9%)	42 (4.2%)	127 (11.0%)	
	> 2	116 (5.4%)	53 (5.4%)	63 (5.5%)	
Attendance at discotheques (median = 1.25)	0	1722 (80.4%)	824 (83.4%)	898 (77.7%)	p < 0.01
	> 0 to ≤ 0.75	149 (6.9%)	61 (6.2%)	88 (7.6%)	
	> 0.75 to ≤ 2.25	130 (6.1%)	47 (4.7%)	83 (7.2%)	
	> 2.25	142 (6.6%)	56 (5.7%)	86 (7.5%)	
Riding a moped (median = 1.00)	0	1869 (87.2%)	848 (85.8%)	1021 (88.4%)	p < 0.01
	> 0 to ≤ 0.375	91 (4.2%)	28 (2.8%)	63 (5.4%)	
	> 0.375 to ≤ 2.25	85 (4.0%)	32 (3.3%)	53 (4.6%)	
	> 2.25	98 (4.6%)	80 (8.1%)	18 (1.6%)	
Watching movies (e.g. DVDs) via headphones (median = 1.00)	0	1634 (76.2%)	743 (75.2%)	891 (77.1%)	p = 0.08
	> 0 to ≤ 0.5	181 (8.5%)	77 (7.8%)	104 (9.0%)	
	> 0.5 to ≤ 1.96	137 (6.4%)	68 (6.9%)	69 (6.0%)	
	> 1.96	191 (8.9%)	100 (10.1%)	91 (7.9%)	
Audio books, reports or sport programs via headphones (median = 0.63)	0	1938 (90.4%)	886 (89.7%)	1052 (91.1%)	p = 0.06
	> 0 to ≤ 0.25	70 (3.3%)	29 (2.9%)	41 (3.6%)	
	> 0.25 to ≤ 1.17	67 (3.1%)	32 (3.2%)	35 (3.0%)	
	> 1.17	68 (3.2%)	41 (4.2%)	27 (2.3%)	
Listening to music with PMP via headphones (Oldies, Jazz) (median = 0.50)	0	1749 (81.6%)	822 (83.2%)	927 (80.2%)	p = 0.18
	> 0 to ≤ 0.25	140 (6.5%)	57 (5.8%)	83 (7.2%)	
	> 0.25 to ≤ 1.17	142 (6.6%)	59 (6.0%)	83 (7.2%)	
	> 1.17	112 (5.3%)	50 (5.0%)	62 (5.4%)	
Listening to music with PMP via headphones (Classical) (median = 0.50)	0	1881 (87.8%)	900 (91.1%)	981 (84.9%)	p < 0.01
	> 0 to ≤ 0.24	82 (3.8%)	29 (2.9%)	53 (4.6%)	
	> 0.24 to ≤ 1	97 (4.5%)	28 (2.8%)	69 (6.0%)	
	> 1	83 (3.9%)	31 (3.2%)	52 (4.5%)	

(Continued)

Supplementary Table 2. (Continued)

<i>Activities</i>	Hours per week	Frequencies total N (%)	Boys N (%)	Girls N (%)	p-value*
Attendance at sport events in a stadium (e.g. soccer game) (median = 0.50)	0	1644 (76.7%)	686 (69.5%)	958 (82.9%)	p < 0.01
	> 0 to ≤ 0.45	167 (7.8%)	99 (10.0%)	68 (5.9%)	
	> 0.45 to ≤ 0.75	171 (8.0%)	100 (10.1%)	71 (6.2%)	
	> 0.75	161 (7.5%)	103 (10.4%)	58 (5.0%)	
Home handyman works, noisy home tools (median = 0.50)	0	1352 (63.1%)	509 (51.5%)	843 (73.0%)	p < 0.01
	> 0 to ≤ 0.19	196 (9.2%)	99 (10.0%)	97 (8.4%)	
	> 0.19 to ≤ 0.7	303 (14.1%)	189 (19.2%)	114 (9.9%)	
	> 0.7	292 (13.6%)	191 (19.3%)	101 (8.7%)	
Cinema visits (median = 0.50)	0	241 (11.3%)	155 (15.7%)	86 (7.4%)	p < 0.01
	> 0 to ≤ 0.46	410 (19.1%)	199 (20.2%)	211 (18.3%)	
	> 0.46 to ≤ 0.71	845 (39.4%)	362 (36.6%)	483 (41.8%)	
	> 0.71	647 (30.2%)	272 (27.5%)	375 (32.5%)	
Attendance at rock, pop or jazz concerts (median = 0.48)	0	1854 (86.5%)	872 (88.3%)	982 (85.0%)	p = 0.09
	> 0 to ≤ 0.21	82 (3.8%)	31 (3.1%)	51 (4.4%)	
	> 0.21 to ≤ 0.625	107 (5.0%)	41 (4.2%)	66 (5.7%)	
	> 0.625	100 (4.7%)	44 (4.4%)	56 (4.9%)	
Attendance at classical concerts or operas (median = 0.25)	0	1969 (91.9%)	922 (93.3%)	1047 (90.6%)	p < 0.05
	> 0 to ≤ 0.17	55 (2.6%)	18 (1.8%)	37 (3.2%)	
	> 0.17 to ≤ 0.4	46 (2.1%)	22 (2.2%)	24 (2.1%)	
	> 0.4	73 (3.4%)	26 (2.7%)	47 (4.1%)	

*p-values derived from Mantel-Haenszel χ^2 - tests for gender differences (in categories). Significant p-values are bold.

Supplementary Table 3. Mean SPLs at the ear of the player.

Instrument	Source	SPL in dB(A)
Accordion		85 dB(A) (estimated)
Bass	Hohmann, 2010	81 dB(A)
Viola	Hohmann, 2010	90 dB(A) (like violin)
Cello	Hohmann, 2010	84 dB(A)
Electric bass	Hohmann, 2000	90 dB(A)
Electric guitar	Hohmann, 2000	90 dB(A)
Euphonium	Hohmann, 2010	93 dB(A) (like tuba/trumpet)
Bassoon	Hohmann, 2010	87 dB(A)
Recorder	Hohmann, 2000	86 dB(A)
Guitar	Suva, 2009	80 dB(A)
Dulcimer	Suva, 2009	80 dB(A) (like string instrument)
Bugle	Hohmann, 2010	93 dB(A)
Keyboard	Hohmann, 2000	90 dB(A)
Clarinet	Hohmann, 2010	92 dB(A)
Piano	Hohmann, 2000	80 dB(A)
Oboe	Hohmann, 2010	85 dB(A)
Trombone	Hohmann, 2010	96 dB(A)
Flute	Hohmann, 2010	91 dB(A)
Saxophone	Hohmann, 2000	95 dB(A)
Drums	Hohmann, 2010	93 dB(A)
Singing	Hohmann, 2010	85 dB(A)
Percussion	Hohmann, 2000	95 dB(A)
Trumpet	Hohmann, 2010	93 dB(A)
Tuba	Hohmann, 2010	93 dB(A)
Ukulele	Suva, 2009	80 dB(A) (like string instrument)
Violin	Hohmann, 2010	90 dB(A)
Xylophone	Hohmann, 2000	80 dB(A) (like piano)
Zither	Suva, 2009	80 dB(A) (like string instrument)
Banjo	Suva, 2009	80 dB(A) (like string instrument)
Didgeridoo		80 dB(A) (estimated)
Harmonica		85 dB(A) (estimated)
Orchestra	Hohmann, 2000	90 dB(A)
Organ	Hohmann, 2000	80 dB(A)
French horn	Hohmann, 2010	93 dB(A) (like horn)

Supplementary Table 4. Distribution of energy equivalent total leisure time noise exposure for a 40-hour week among participants in Ohrkan.

Noise exposure in dB(A)	Girls N (%)	Sensitivity analysis Lower V	Sensitivity analysis Upper V	Boys N (%)	Sensitivity analysis Lower V	Sensitivity analysis Upper V	Total N (%)	Sensitivity analysis Lower V	Sensitivity analysis Upper V
<80	283 (24.5%)	604 (52.3%)	209 (18.1%)	227 (23.0%)	498 (50.4%)	148 (15.0%)	510 (23.8%)	1102 (51.4%)	357 (16.7%)
80 ≤ 85	418 (36.2%)	219 (19.0%)	319 (27.6%)	318 (32.2%)	195 (19.7%)	264 (26.7%)	736 (34.3%)	414 (19.3%)	583 (27.2%)
> 85 to ≤ 90	243 (21.0%)	139 (12.0%)	364 (31.5%)	264 (26.7%)	135 (13.7%)	295 (29.9%)	507 (23.7%)	274 (12.8%)	659 (30.7%)
> 90	211 (18.3%)	193 (16.7%)	263 (22.8%)	179 (18.1%)	160 (16.2%)	281 (28.4%)	390 (18.2%)	353 (16.5%)	544 (25.4%)

Mantel-Haenszel χ^2 : $p = 0.12$ for gender difference (conventional value);

Mantel-Haenszel χ^2 : $p = 0.61$ for gender difference (sensitivity analysis: lower value);

Mantel-Haenszel χ^2 : $p = 0.01$ for gender difference (sensitivity analysis: upper value).