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Erdelyi, Kristina; Fuermaier, Anselm; Koerts, Janneke; Tucha, Lara; Tucha, Oliver

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# Low-Frequency Noise: Experiences from individuals reporting LFN complaints

Kristina Erdélyi<sup>1</sup>, Anselm Fuermaier<sup>1</sup>, Janneke Koerts<sup>1</sup>, Lara Tucha<sup>2</sup>, Oliver Tucha<sup>1,2,3</sup>

<sup>1</sup> Department of Clinical and Developmental Neuropsychology, University of Groningen, Groningen, The Netherlands, <sup>2</sup> Department of Psychiatry and Psychotherapy, University Medical Center Rostock, Rostock, Germany, <sup>3</sup> Department of Psychology, Maynooth University, National University of Ireland, Maynooth, Ireland

## Low-Frequency Noise (LFN)

Low-Frequency Noise (LFN) refers to sound waves around/below the hearing threshold (below 125 Hz).<sup>1</sup>

Sources of LFN can be natural (e.g.: sea waves, wind) but are mostly man-made (e.g.: traffic, turbines, pumps).<sup>1</sup>

Sources and complaints of LFN are rising. An estimated 2% of the Dutch population experience severe annoyance from LFN.<sup>1,2,3</sup>

## Self-reported complaints of individuals reporting LFN

Physical: Headache, dizziness, palpitation, neck/ back/ aural pain<sup>2,4,5</sup>

Psychological: Sleeping difficulties, fatigue, annoyance, stress, feelings of depression, frustration<sup>2,4,5</sup>

Cognition: Difficulties in concentration, cognitively demanding tasks, executive functions<sup>2,4,5,6</sup>

Well-being & daily functioning: Lower quality of life, job loss, incapacity to work, relationship or family problems, housing issues<sup>2,4</sup>

## LFN research is urgently needed

LFN is still a hardly recognized and investigated environmental stressor.

The source of reported sounds is often not found (e.g.: by inaccurate measurement methods or complaints originating from a possibly non-LFN related cause).<sup>2</sup>

Previous research often used small and specific groups, unstructured observations or subjective reports, short-term laboratory LFN-exposures, or applied different definitions of LFN. Research objectifying subjective complaints does not allow for conclusions yet.

## Individual factors and LFN

Knowledge on individual factors associated with noise reactions in this group is scarce.<sup>5</sup> Current research indicates:

- 1) Sociodemographic factors: LFN-perceptions are most commonly reported by individuals between 50-70 years and in 2/3 of cases by females.<sup>2,4,7</sup>
- 2) Personality factors: Introverts seem more sensitive to and more annoyed by LFN and perform worse on cognitive tasks during LFN exposure despite being faster compared to extraverts.<sup>8,9,10</sup> However, firm conclusions regarding this or other aspects of personality cannot be made so far.

## Type of LFN perception

There seems to be substantial heterogeneity regarding the reported type of LFN perceptions. Some general tendencies seem to be:<sup>2,4,7</sup>

- 1) Location: mainly indoors, especially at home.
- 2) Time: mostly all the time or at night only, rarely at daytime only.
- 3) Type: by hearing (often a humming, sometimes a buzzing, throbbing, or engine-like sound). But also feelings of pressure and vibrations are reported.

The considerable individual differences in LFN perceptions necessitate further investigation and the examination of possible subgroups.

## The current research of the University of Groningen

Within a systematic, large-scale research project, a present study investigates

- 1) the demographic and personal characteristics of individuals reporting LFN complaints
- 2) the specific LFN perceptions (including location, time, type, circumstances)
- 3) reported physical, psychological, and social health-related symptoms and restrictions in daily living

in comparison to individuals who are not perceiving LFN.



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