



International Noise
Awareness Day

International Noise Awareness Day in Europe 2017

Brigitte Schulte-Fortkamp, Vice President EAA

EAA INAD in Europe 2017 Steering Committee
Sergio Luzzi, Antonio Perez Lopes, Michael Taroudakis, Brigitte Schulte-Fortkamp

The INAD in Europe is an Initiative of the EAA

- This presentation focus on the aims of the International Noise Awareness Day
- Informs about the background of this INAD
- Gives an overview on noise effects
- Provides insights in practice and theory regarding noise management



**International Noise
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Noise Awareness Day

- ▶ In 1996 the International Noise Awareness Day (INAD) was suggested by the Center for Hearing and Communication (<http://chchearing.org/noise/day/>).
- ▶ Since 1997 the INAD was celebrated every year by some of the European Acoustics Association (EAA) as Germany, Spain, Italy, Austria, Greece, Portugal, and Switzerland.
- ▶ A series of events was and is addressed to the society very often with special emphasis to young people who are among the most sensitive parts of our society.
- ▶ These events are organized typically by the individual Member Societies.
- ▶ This year for the first time we celebrate the European INAD <https://euracoustics.org/INAD2017/>



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INAD by EAA

- ▶ EAA will collaborate with the [European Commission](#) (in particular the DG-Environment) and the European Environment Agency for promoting and coordinating specialized activities during this year
- ▶ among the EAA members Societies,
- ▶ and the European and national authorities,
- ▶ the noise associations,
- ▶ the schools, museums, etc.
- ▶ in order that a wider public will receive the most accurate and scientifically correct information on noise effects.



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INAD 2017: Wednesday, April 26, 2017

- ▶ All over the world, people, organizations, and governments will commemorate the 22nd Annual International Noise Awareness Day (INAD) on Wednesday, April 26, 2017.
- ▶ The Center for Hearing and Communication (CHC) founded this yearly event in 1996 to encourage people to *do something* about bothersome noise where they work, live, and play.
- ▶ <http://chchearing.org/noise/day/>



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The INAD in USA

<http://chchearing.org/noise/day/organizers>

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- ▶ To address the widespread, insidious impact of noise on hearing, health and the quality of life, the Center for Hearing and Communication sponsors **International Noise Awareness Day** every April, in conjunction with professional organizations, community activists and individuals around the world.
- ▶ Each year, professional organizations and community groups from around the country play an important role in this campaign by providing free hearing screenings, disseminating information and hearing protection, and helping to promote the importance of reducing noise in our lives. The response has been overwhelming from participants and the media.



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Why do we need internationally noise awareness?

- ▶ **Why do we care so much about unwanted noise?**
<http://chchearing.org/noise/day/>
- ▶ In the short term, noise causes stress, and as most of us understand, stress is terrible for your health. In the long term, noise causes hearing loss—and hearing loss is also detrimental to your health.
- ▶ Individuals and communities no longer accept that noise is a natural by-product of an industrial society. Grassroots activist groups address the issue of noise in their own communities. New Yorkers gave noise as the leading complaint to quality to the city's life quality hotline.
- ▶ Adults may be the ones to have the greatest concerns about and problems dealing with noise, but children can suffer just as much, and there may be no indication as such to their parents.



Getting connected around the world by **A Minute's Peace and Quiet**

- ▶ **Ask for A Minute's Peace and Quiet (part of The Quiet Diet)**
- ▶ Ask for *60 Seconds of No Noise* from 2:15 – 2:16 pm (regardless of time zone). Just one minute highlights what “quiet” really sounds like, and how little thought most people give to everyday noise.



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Noise Effects

- Because of the omnipresence of sound in our perceptual world, this sensory element influences the quality of life.
- Very often sound will become NOISE and therefore hurting people through annoyance and impacts on health.
- The complex interplay between the diverse dimensions of sound leads to classifications like annoying, pleasant, loud, quiet, disturbing, comfortable.
- The perception of sound can only be retraced with the help of a multidimensional approach, which covers the different dimensions.



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Noise Effects - cont

- Measurements of SPL grasps only the physical dimension.
- Measurements of A-weighted level considers partly the human processing of sound.
- “Fast” time integration of SPL meter is too long, human hearing has an integration time around 2 ms.
- Altogether, the quantification of the sound intensity does not capture the particularities of sound events.
- By means of these measurements statements about annoyance or pleasantness caused by sound cannot be provided.



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END 2002/49/EC

After consensus had been reached about harmonized indicators of noise exposure and a standard annoyance question format it seemed we had forgotten that the size of variance explanation of the standard dose-response curve is limited and varies from location to location.



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New Insights in the Existing Annoyance through

- Multi-sectoral environmental health impact assessment
- Perspective on sustainable development
- Environmental zoning
- Citizen involvement
- Preservation of quiet areas
- Consideration of “sensitive areas“
- Design of “supportive environments“



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END 2002/49/EC

- Reducing noise level has been the focus in the END, but this is not always feasible and cost-effective, and more importantly, will not necessarily lead to improved quality of life and people's satisfaction.
- Enormous resources are being used on environmental noise reduction, but there is an urgent need to provide an approach which involves diverse fields of practice and diverse interdisciplinary interests related to people's expertise.



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Sonic environment as a mediator

- ▶ The “Sonic Environment” is a mediator between humans, their activities and the physical world.
- ▶ It has to be considered that sound sources attribute "meanings" to the exposed and block or enable human activities, thoughts, feelings.
- ▶ Moreover, it depends on the "acoustic coloration" of the larger environment like geography, climate, wind, water, people, buildings, animals etc how people react to or deal with sounds.

Hiramatsu et al, Internoise 2009



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New: Soundscape Concept

- ▶ The Soundscape concept was introduced as a scope to rethink the evaluation of “noise” and its effects and to focus on a diverse field of experts and expertise in order to fulfill the requirements for a „good environment“ or a „sensitive environment” with respect to quality of life.



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Soundscape Standard

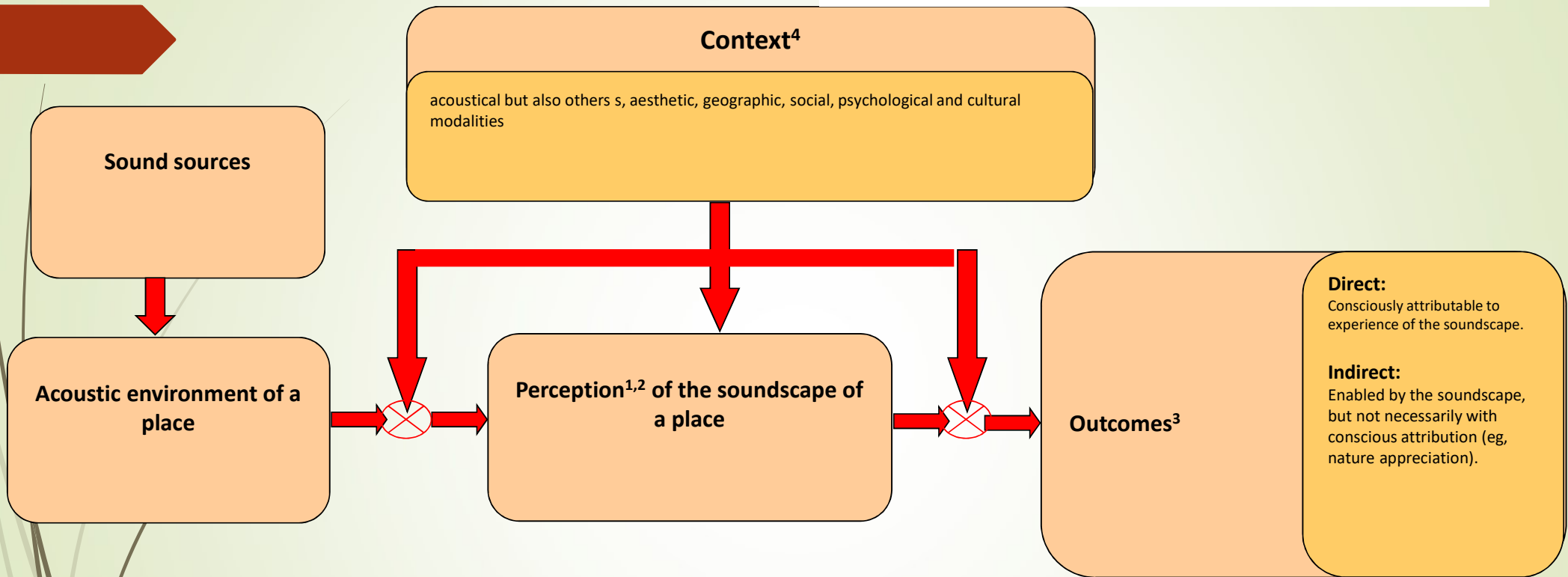
An acoustic environment as perceived and or experienced and/or understood by people, in context.

ISO/TC 43/SC 1/WG 54-ISO/DIS 12913-1 Perceptual assessment of soundscape quality

This definition implies that management and design of Soundscape concerns intervention that have relevance to human perception and experience and understanding of the acoustic environment.



Soundscape: an acoustic environment as perceived in context



¹Appropriately aggregated, individual perceptions can constitute a societal judgment of soundscape

²Soundscape may be as currently experienced, or in memory (eg soundscapes of one's childhood)

³A large number of diverse outcomes can be associated with human experience of soundscapes. Example direct outcomes are tranquillity, excitement, place-attachment, well-being, comfort, etc

⁴These are examples, not an exhaustive list, of mediating contexts

Different outcomes variously measurable as attitudes, cognitive responses, emotional responses, overt and covert behaviours (including feedback that may change the context)

Schomer at al 2009

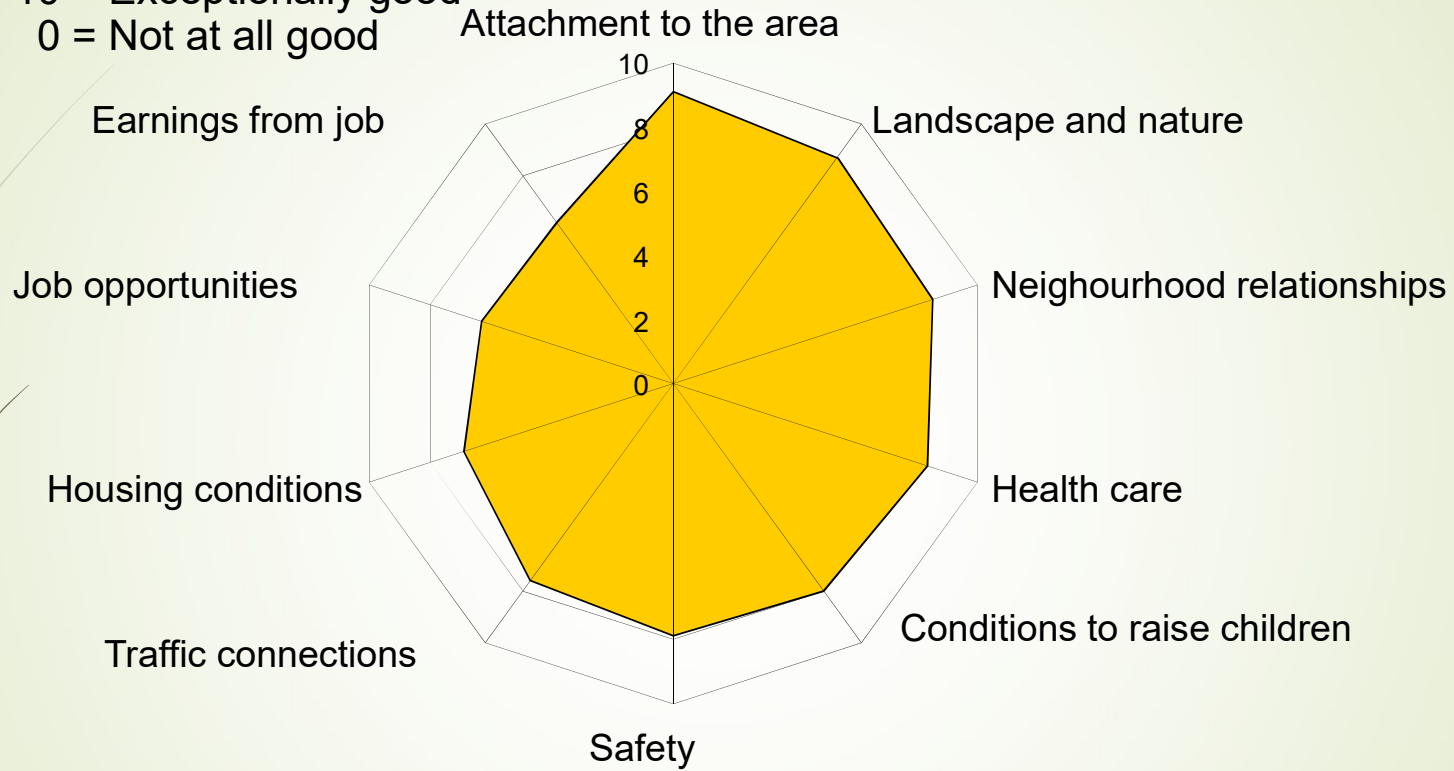
How to Consider an Acoustic Environment and its Effects

- ▶ The next slides will provide insight how an impact on annoyance and health will happen with regard to different sources.



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10 = Exceptionally good
0 = Not at all good



General judgement of environmental living conditions
by category: means

MUI-Social Medicine

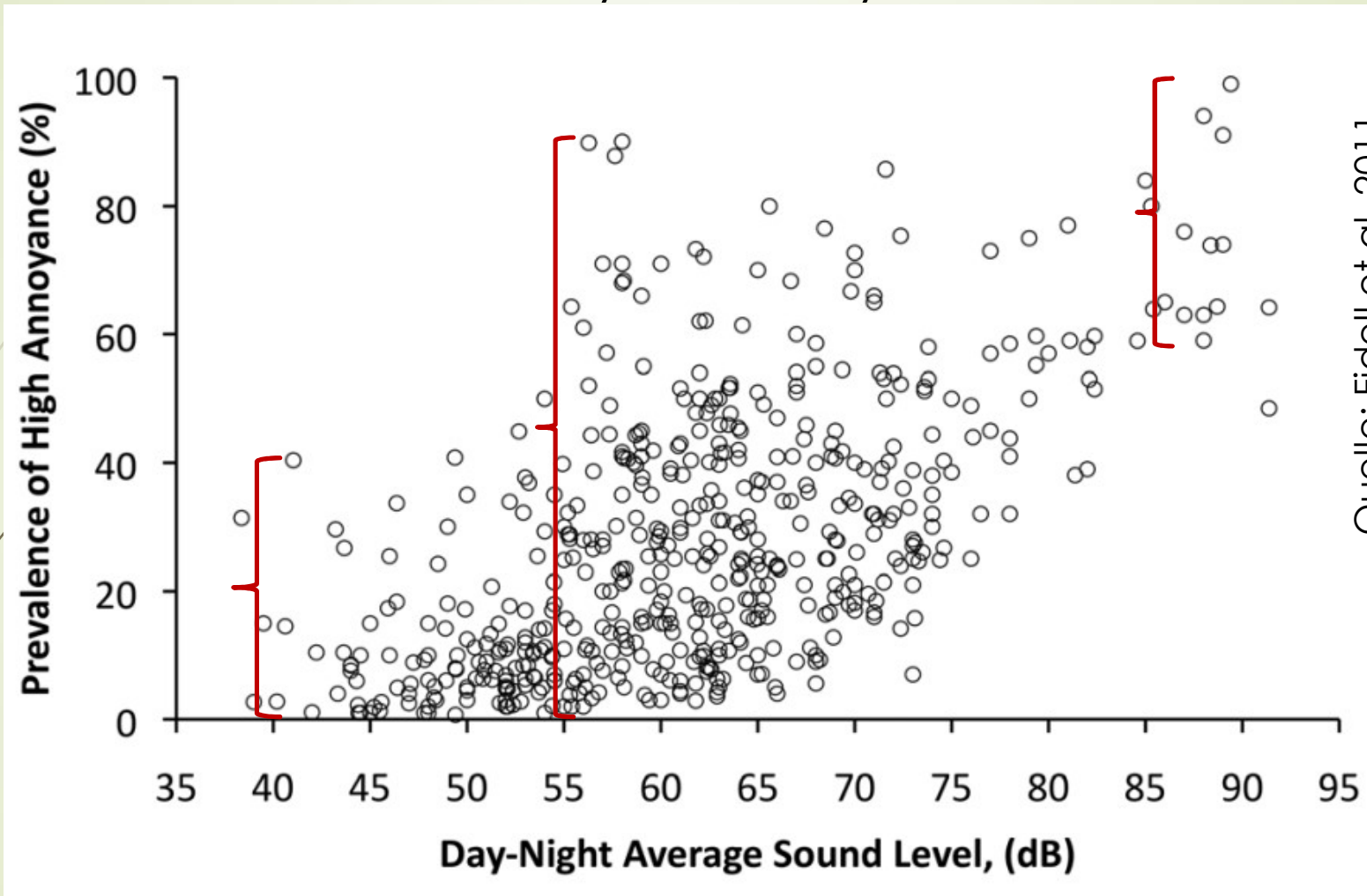
Lercher, 2006 BBT-study, unpublished



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Variability in Annoyance

Air-traffic



Quelle: Fidell et al. 2011

Illustration of variability in aircraft annoyance prevalence rates as a function of cumulative noise exposure. Each point represents an estimate of the prevalence of high annoyance at a single interviewing site.



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Environmental health risk assessment	Sound level	Prevention
Established increase of health risks	>65 dBA	Protection against adverse effects
Health risks cannot be ruled out with certainty Percentage of highly annoyed >25%	55-64 dBA	
Percentage of highly annoyed increases	45-54 dBA	Protection of life quality
Quiet residential areas	35-44 dBA	Permits and promotes restoration
Quietness	<35 dBA	
Silence	<25 dBA	
		Promotion

— 55 dBA: Quiet area in urban agglomerations

— 40 dBA: Quiet area in rural settlements

Example: EHIA for aircraft noise: state of the art- MUI Peter Lercher



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Scientific rationale to use quality of life related health endpoints in environmental assessments

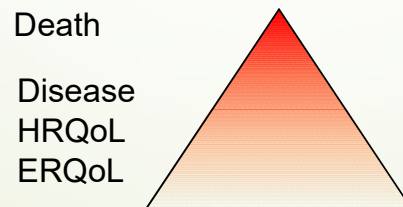
After the **epidemiological transition** the (good or bad) experience of health while alive requires more attention

The **demographic shift** to „older societies“ requires supportive and restorative environments to stay healthy

Latency time: The longer people live with suboptimal exposure conditions (even such of „low toxicity“) the more likely an impact will show up later in life and increase morbidity and decrease functional health

We need to know more about how **positive health** is created by quiet areas or optimised soundscapes (health promotion)

More people are affected at **the lower end of the morbidity pyramid**



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Involved theoretical concepts

	Stress Perspective	Coping Perspective	Restoration Perspective
Theoretical Premise	Heavy demands can undermine adaptation.	Readily available resources support adaptation.	Adaptation requires periodic restoration.
Practical Premise	Interventions can eliminate or mitigate demands.	Interventions can ensure the availability of resources.	Interventions can enhance opportunities for restoration.

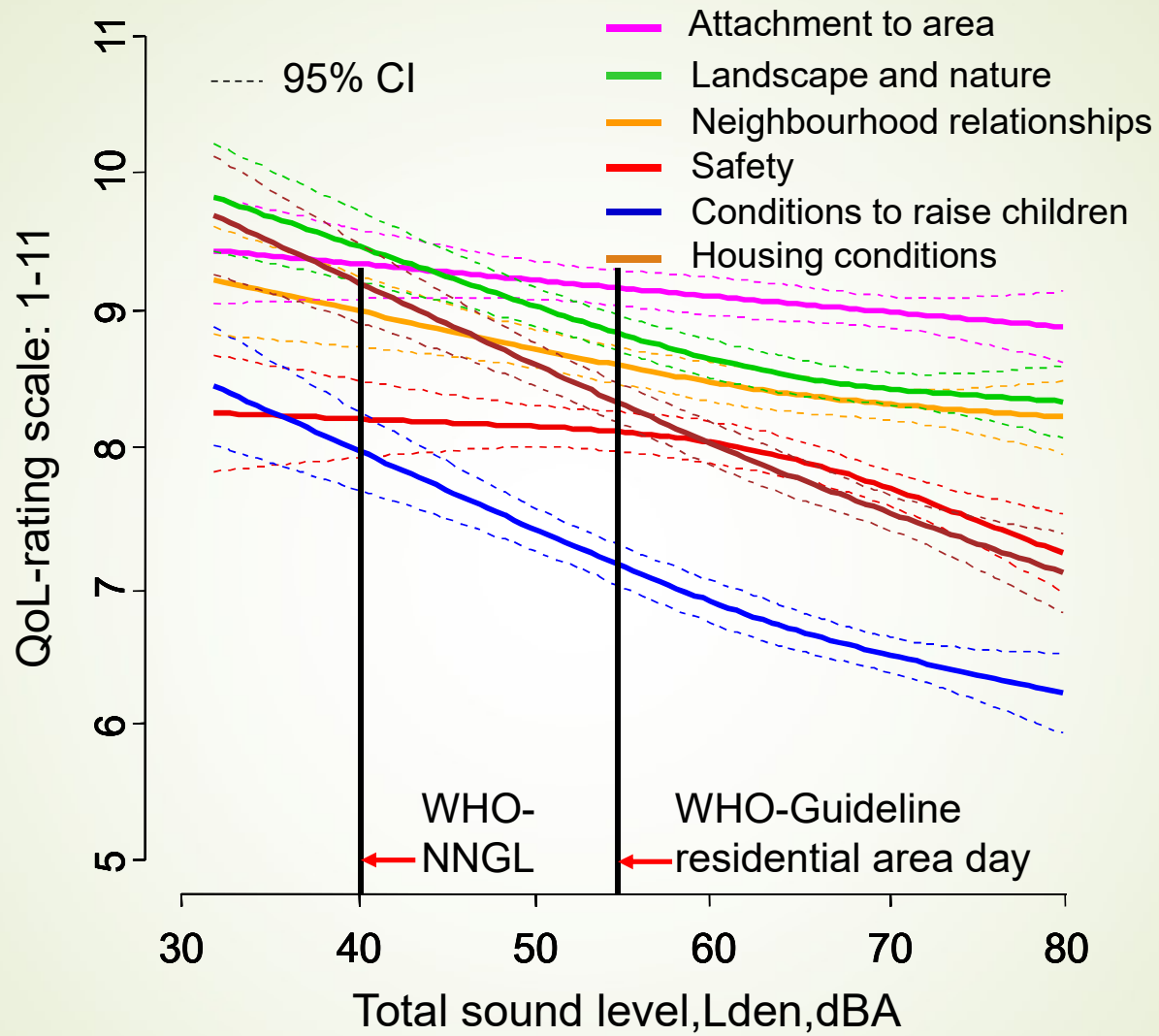
From Hartig, Bringslimark & Patil (2008); Hartig (2008)



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MUI-Social Medicine

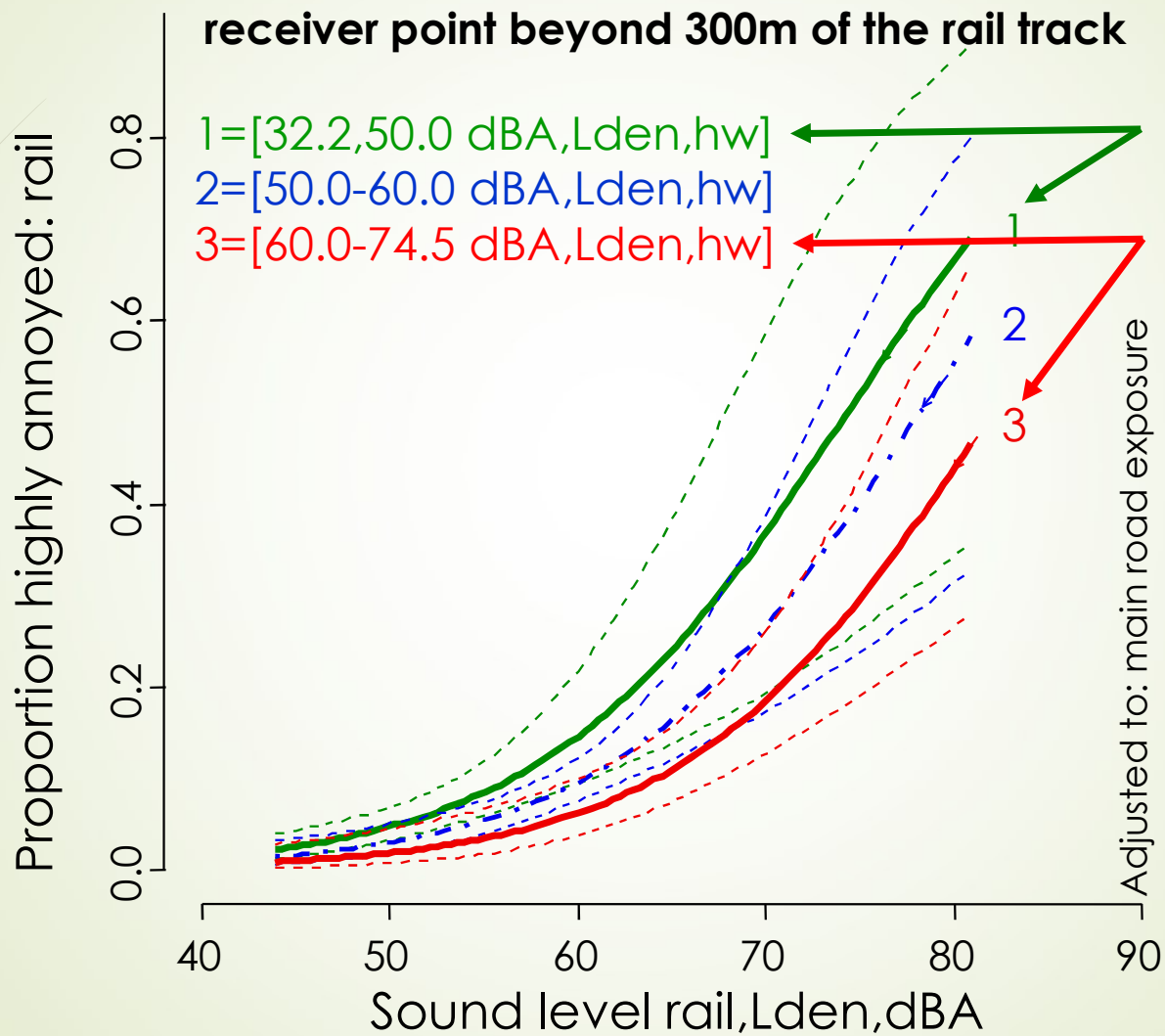


Lercher, 2006 BBT-study, unpublished

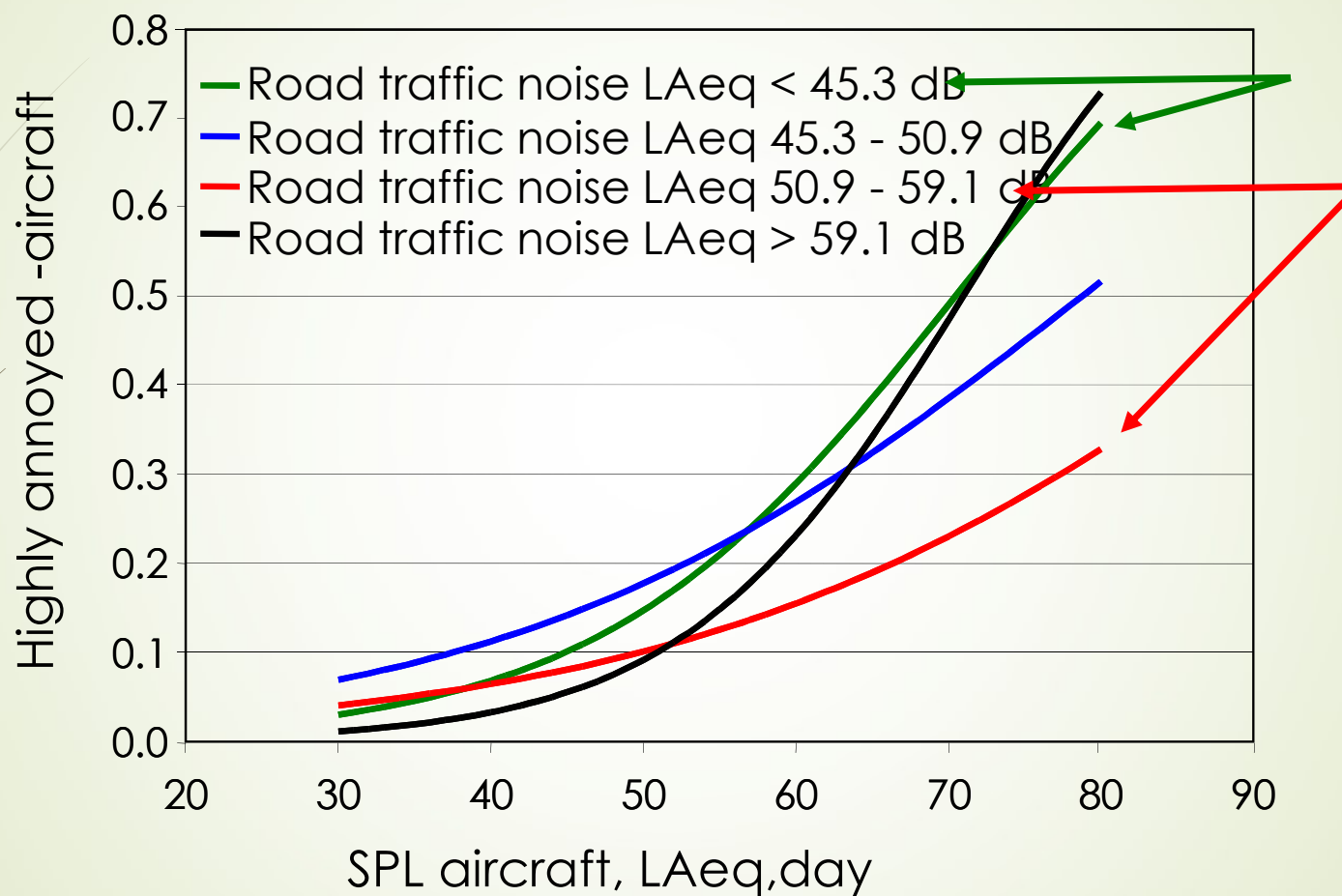


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Rail noise - highly annoyed by highway exposure (hw)



Combined Analysis

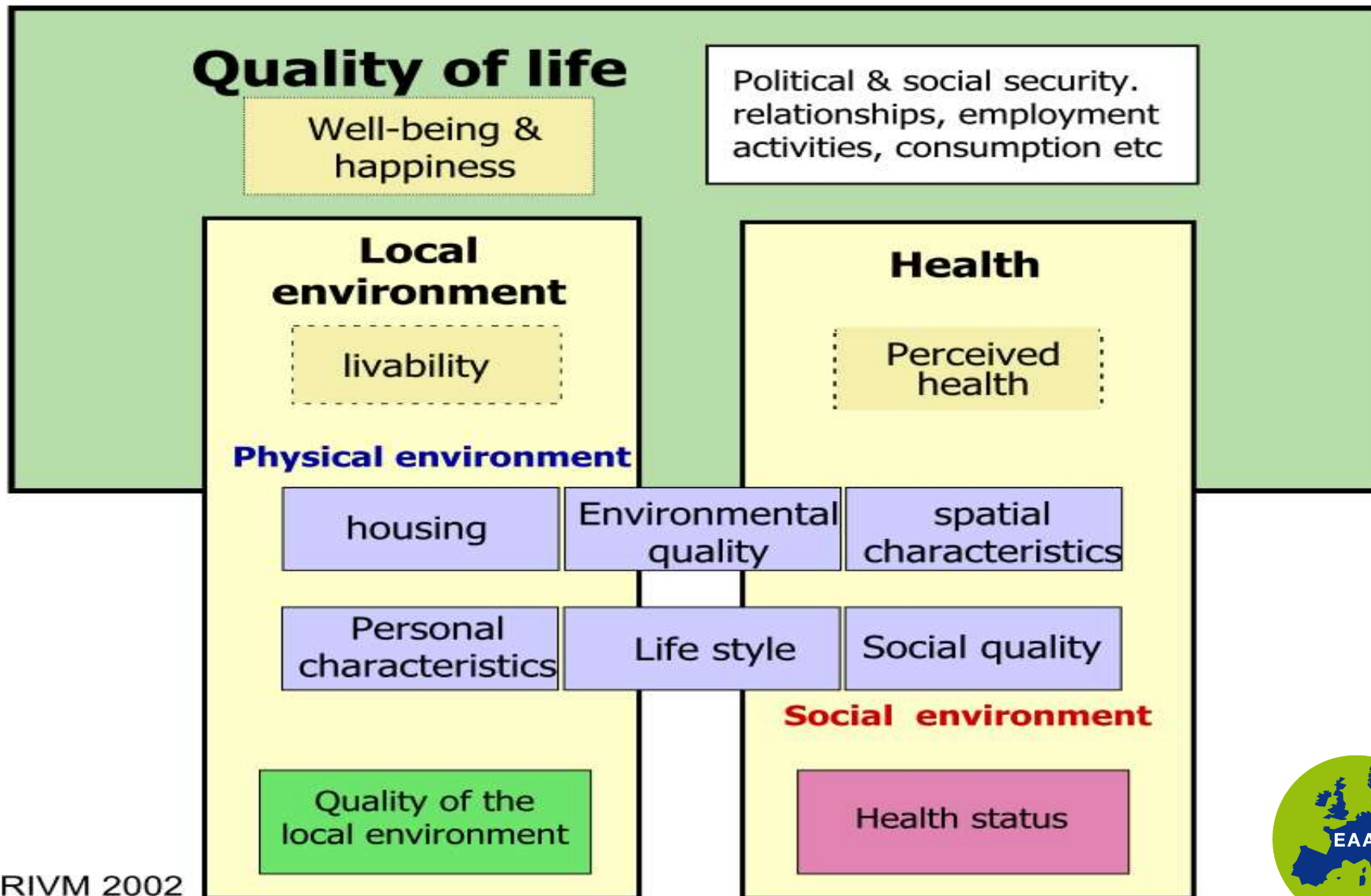


Adjusted to: main road exposure

Daten Basis: Swiss noise study 2000: N=1563



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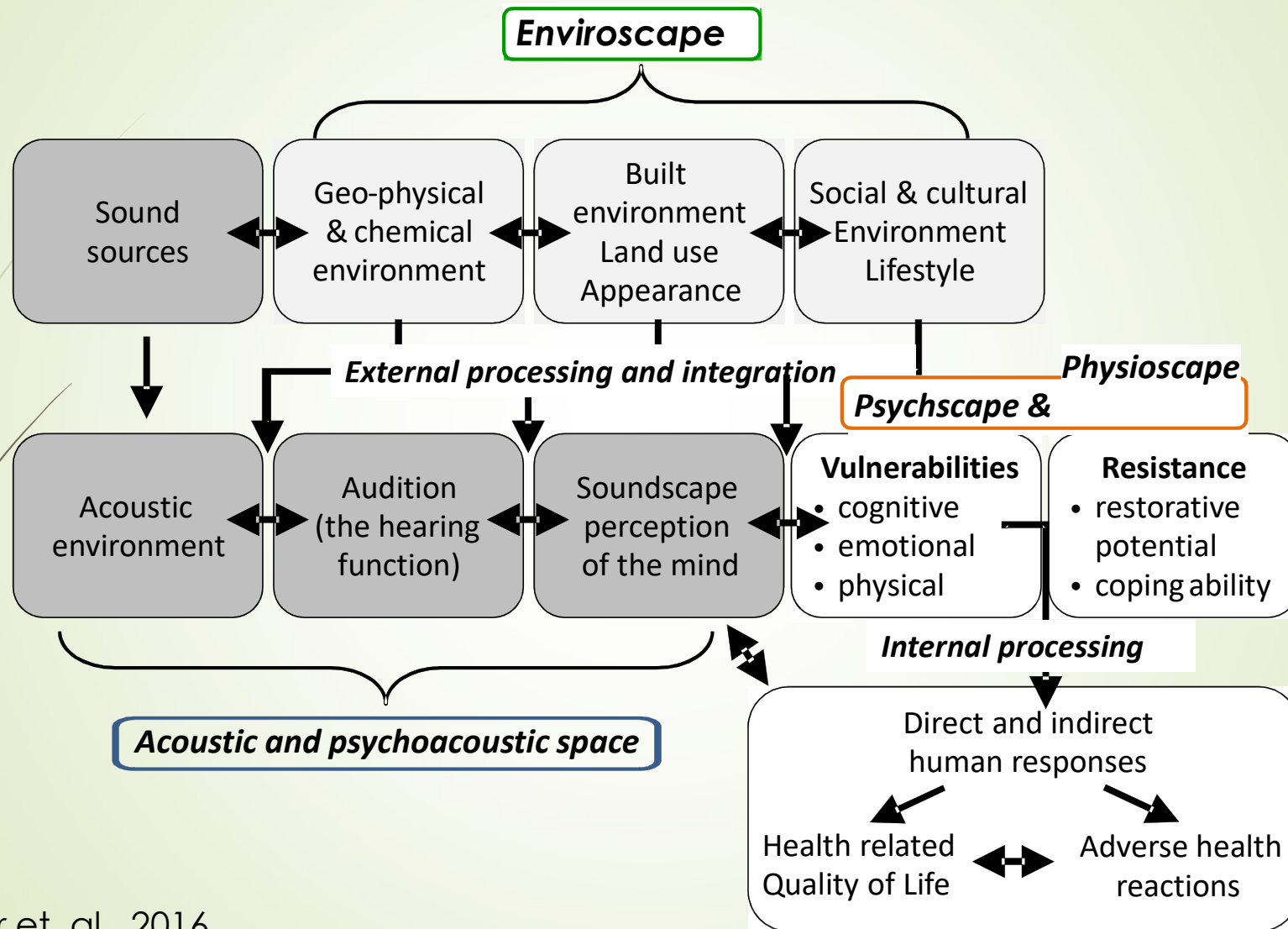


Source: RIVM 2002



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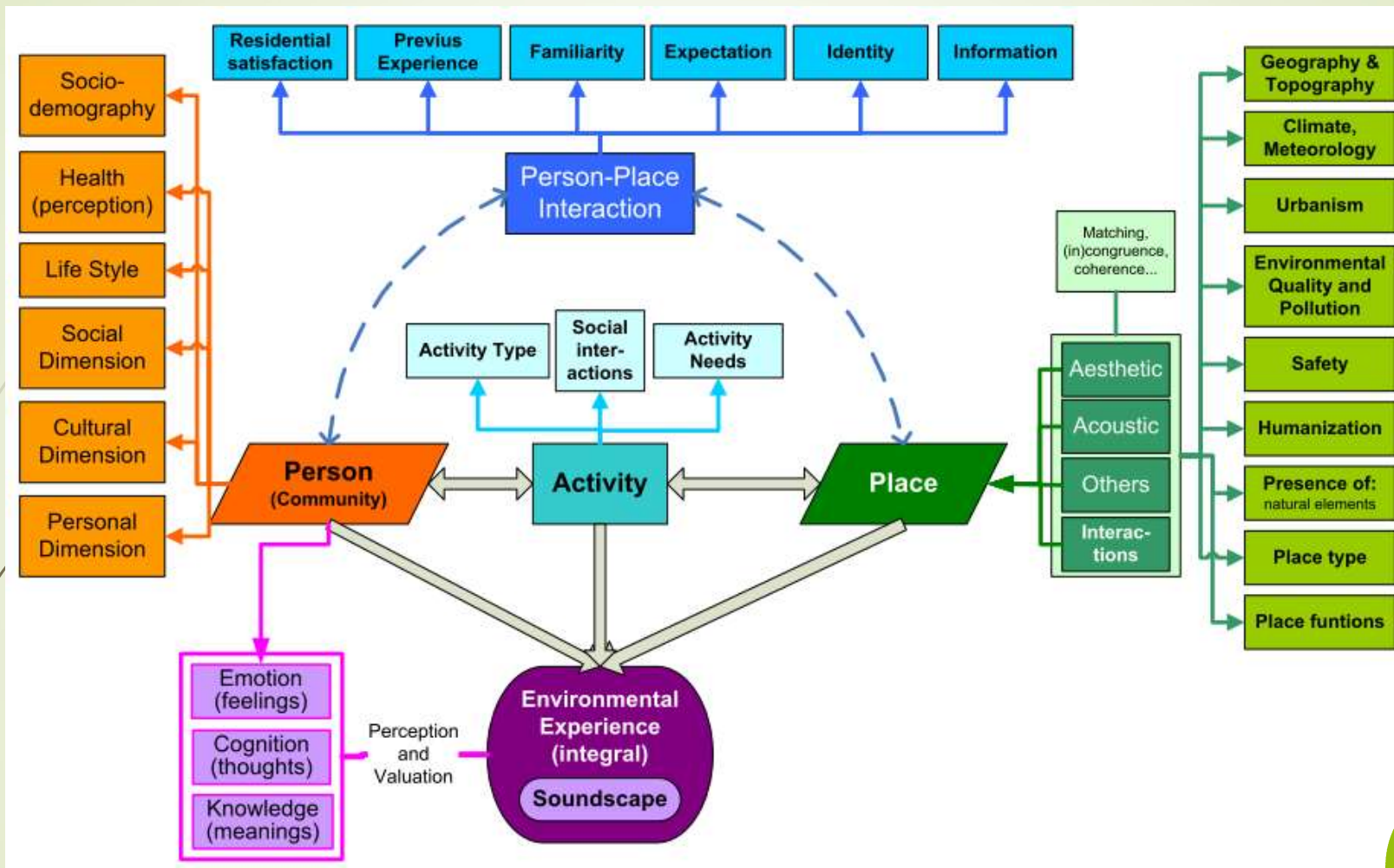
How to Consider an Acoustic Environment and its effects



Source: Lercher et. al., 2016



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Proposal of a Conceptual Model about Environmental Experience
 Source: Herranz-Pascual et al. 2010

The International Noise Awareness Day

should not only focus

- on identifying a problem
- what may be „unwanted“

but also

- on identifying a solution
- what may be „wanted“

and should be seen as a positive contribution to the community and to the environment.



Summary

- An effective and sustainable reduction of highly annoyed people caused by noise is only possible with further scientific endeavors in the area of methods development and research of noise effects.
- Noise maps providing further information can help to obtain a deeper understanding of noise reactions and can help to reliably identify perception-related hot spots.
- Psychoacoustic maps are particularly interesting in areas where the noise levels are marginal below the noise level limits and offer an additional interpretation help with respect to the identification of required noise abatement measures.
- But: people should be involved – the INAD is one platform



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Combining the knowledge in collaboration is the solution

In the Community Noise field, noise level maps can start to provide an understanding of noise reactions and reliably identify perception-related hot spots.

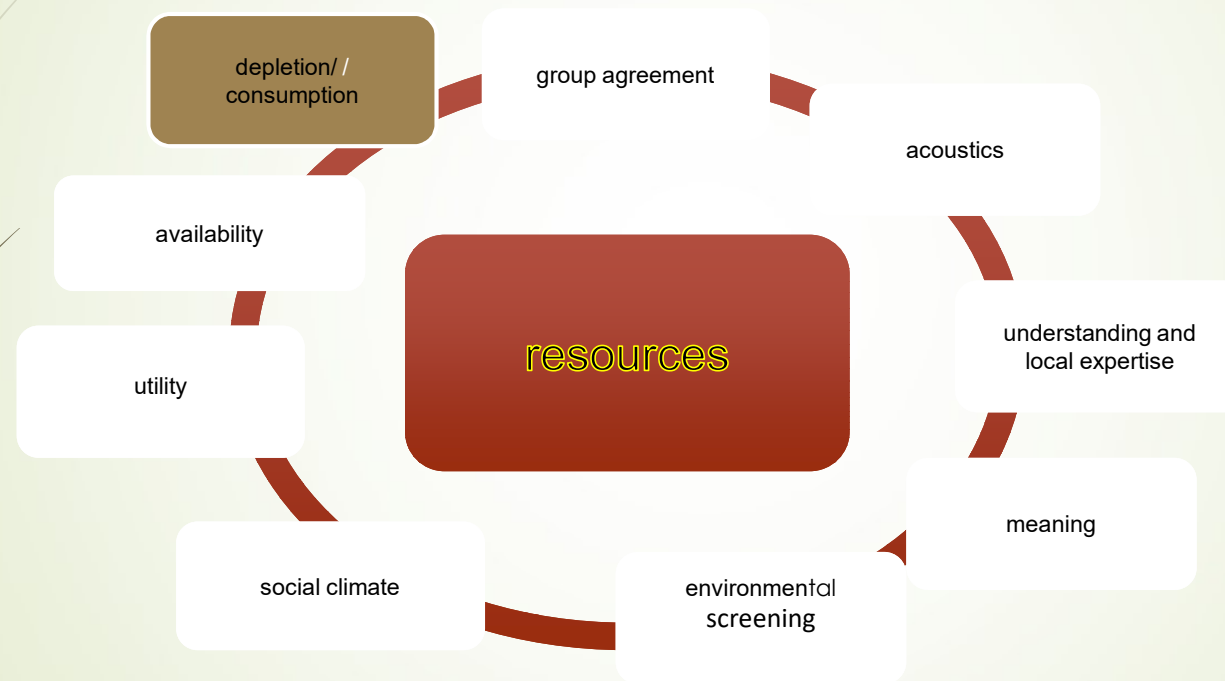
Psychoacoustic parameter maps are particularly interesting in areas where the noise levels are marginal below the mandated noise level limits and offer an additional interpretation to identify the respective noise sources.

To bring peoples' mind into the game and to rely on their perception will be the best start up!



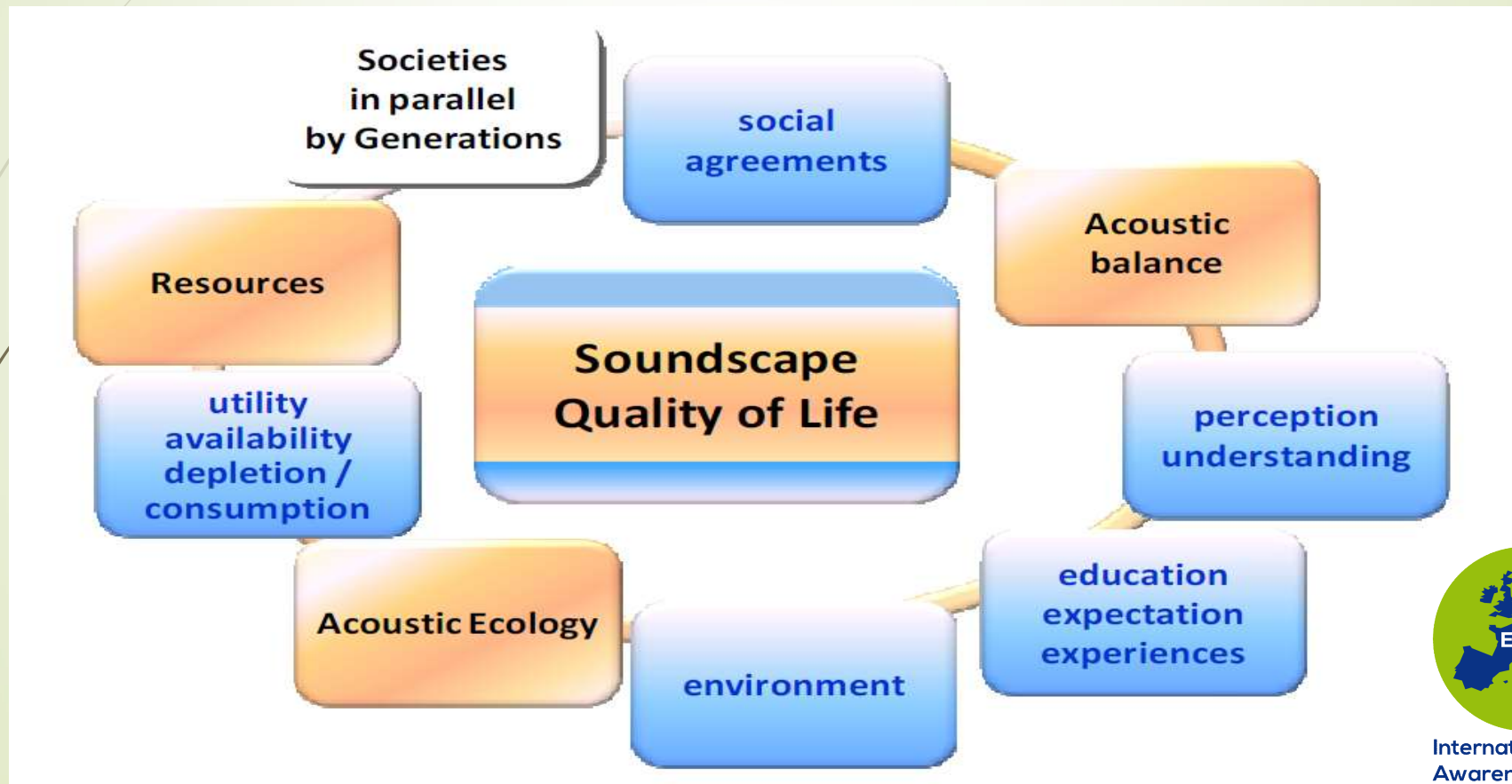
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Using the Resources to live with Noise



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Communication and Collaboration



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Conclusions



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- ▶ The International Noise Awareness Day will support the involvement of different promoters to identify how to use the resources.
- ▶ The International Noise Awareness Day will provide a platform for further development in economic and ecologic as well as in noise policy-standards concerning the enhancement of quality of life.