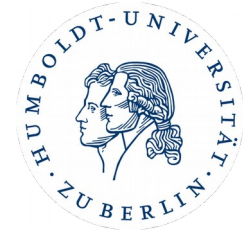




White Unicorn - Association for the Development of an Autistic-Friendly Environment e.V.
in Research Network with the Humboldt University Berlin



Institute for rehabilitation sciences

Winter semester 2018/2019

Noise as a barrier for autistic people

Developing an online questionnaire within the
framework of the master seminar “Measuring by means
of questionnaire”

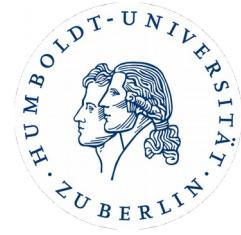
Lecturer:
Dr. Sabine Schwager

Students:
Svea Barba, Farina Friehold, Katja Ryl

Research Network:
White Unicorn e.V.
Stephanie Fuhrmann



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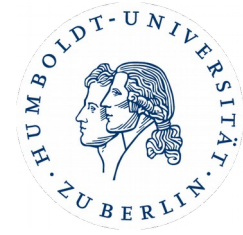


Introduction

- Due to the particularities concerning the processing of information, autistic persons experience a number of situations as unsurmountable barriers which prevent them from participating and developing. Non-autistic persons, on the contrary, will find these circumstances normal or, at the most, somewhat “difficult”.
- This kind of exclusion can be countered if for every autistic person it can be surveyed which barriers exist and what kind of adaptations in their environment are carried out.
- In a research alliance with the Humboldt University Berlin and supported by “Aktion Mensch”, “White Unicorn e.V.”, an advocacy group of autistic people, is surveying the nature of 27 barriers in everyday life, at school and in professional life, comparing autistic and non-autistic people.
- Each barrier is rated by each participant on a scale.



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The barrier “noise”

11. Noises from the human world



([Link: Larger Pop-Up](#))

Where people live you hear many different things. For example cars, machines, children scream, dogs bark, and many other things. It's all noise.

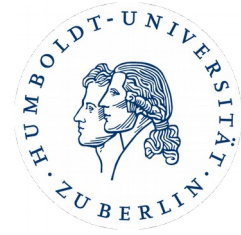
Most people get used to the sounds of their place. From their place of residence, for example. Or from their work place. Or their town. The noises are simply part of it. The people don't even listen to it anymore.

Some people don't like these sounds. Then they don't feel safe. Not like at home. They prefer it quiet at home. When they have all these noises around them, they don't feel well. It's like a mush of many noises. Or that loud noise next to a motorway. You don't understand anything anymore.

These people feel better when they are somewhere out in nature. Where it's very quiet. Or when they're alone in a room. Where they can't hear what's happening outside. Then they feel at home. The many different noises from the human world disturb them very much.



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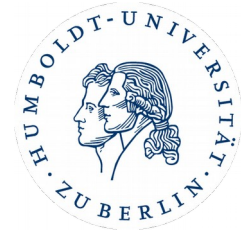


The barrier “noise”

- Each of the barriers has many different aspects and is not just experienced in only one area.
- For a precise surveying it is therefore good to have each barrier rated by means of a number of easy questions instead of by just one single rather complex rating.
- The individual evaluations are easier to understand and can be answered easier and more precise by the participants.
- The barrier “noises from the human world” was chosen as the first to be developed further.



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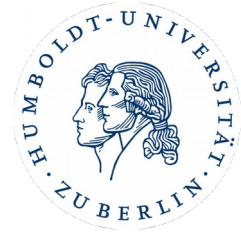


Definition of the attribute “noise as a barrier”

“There are environmental noises that disturb people. We want to find out to which degree environmental noises impair you. Impairment means that you cannot continue what you are doing. Or that you cannot stay right there where you are.”



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Definition of the attribute “noise as a barrier”

- What kind of noises can become a barrier?
- For the four most important kinds about the same number of aspects should be surveyed:

natural	man-made
noises by people	noises by machines
noises from nature	noises by objects



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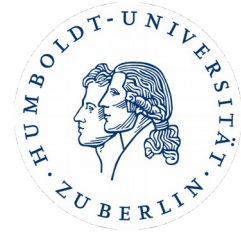


Research questions

- Substantive question:
 - Are noises a barrier for autistic people?
 - Is there a marked difference between autistic and non-autistic people in terms of rating the noises?
- Methodical question:
 - Do the rated environmental noises contribute to surveying the degree to which noises can act as a barrier?
 - Which of the rated noises do so the strongest? (Selecting the most relevant questions)



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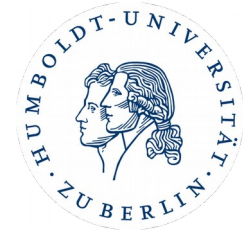


Methodology

- Working with a language that is as simple as possible (low-barrier questionnaire)
- Short and simple description of the noises in order to ask for a rather general evaluation of that noise (and not for a specific situation)
- Eight noises per category (people, nature, machines, objects)
- Four-scale answer as to how strong this noise is seen as a barrier; the respective answer categories are described:



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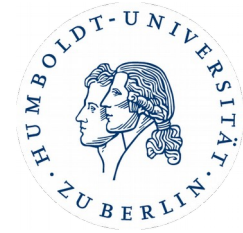


Methodology

- Online survey with “LimeSurvey” over the server of the Humboldt University
(<https://www.cms.hu-berlin.de/de/dl/netze/vpn/software/LimeSurvey/standardseite>)
- Details also surveyed: Age, sex, autistic or non-autistic person



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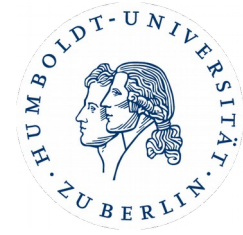
Questionnaire

Natural noises: People

	The situation does not disturb me	I find the situation uncomfortable	I want to change the situation	Situation absolutely must be changed
Babble of voices				
Two or more people quarrel with each other				
Screaming babies				
Children are playing, trampling and rattling with toys				
People are having a phone call				
Whispering people				
Echoing sounds of steps through ceilings and walls in buildings				
Whistling people				



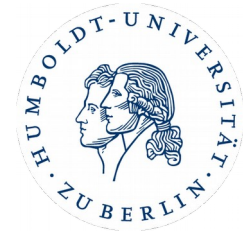
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Questionnaire

Natural noises: Nature

	The situation does not disturb me	I find the situation uncomfortable	I want to change the situation	Situation absolutely must be changed
Dogs barking				
Wind whistling				
Birds chirping				
Leaves rustling				
Fountain splashing				
Noises of a storm				
Thunderstorm				



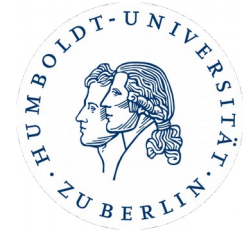
Questionnaire

Men-made noises: Machines

	The situation does not disturb me	I find the situation uncomfortable	I want to change the situation	Situation absolutely must be changed
Driving noise of cars and emergency vehicles				
Noises of airplanes near a Berlin airport				
Driving noises of public transport vehicles				
Humming of a refrigerator				
Construction work in the street				
Mobile phone noises				
Background noise by a TV set				
Noise by a cooling fan in a computer				



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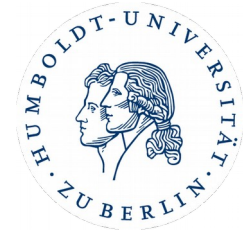
Questionnaire

Man-made noises: Objects

	The situation does not disturb me	I find the situation uncomfortable	I want to change the situation	Situation absolutely must be changed
Ticking of a clock				
Clanking of dishes				
Scratching of chairs				
Humming of lamps				
Noises from water running through pipes in buildings				
Objects toppling				
Rustling newspapers				
Slamming of doors				



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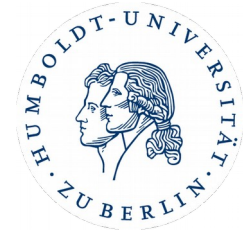


Analysis

- Determining the item difficulty = Probability that a certain noise is experienced as a barrier
- Determining the selectivity = Connection between the rating of a certain noise and the total rating from all rated noises = Contribution of this one noise to a general surveying of “noises as a barrier”
- Selection of the most relevant noises for the end version of the questionnaire = item selection
- Determining the measurement accuracy of the end version
- Comparison of the total values reached by autistic and by non-autistic persons



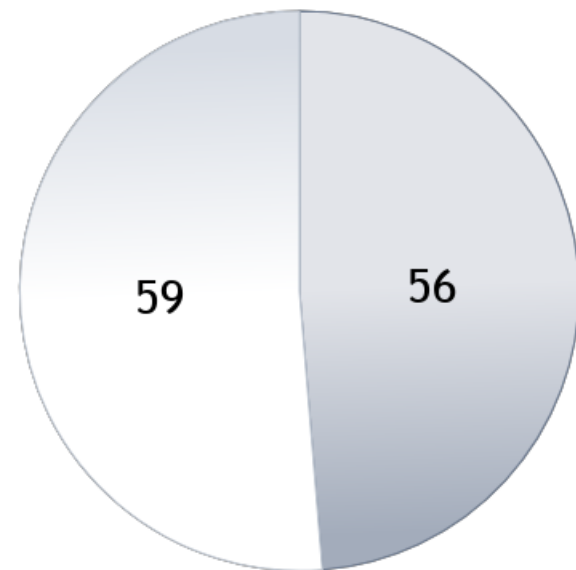
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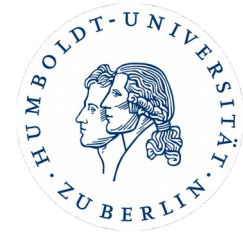
Analysis

- Participants: 115
- Age: 17 – 60
- 9 sheets with an incomplete set of answers were excluded

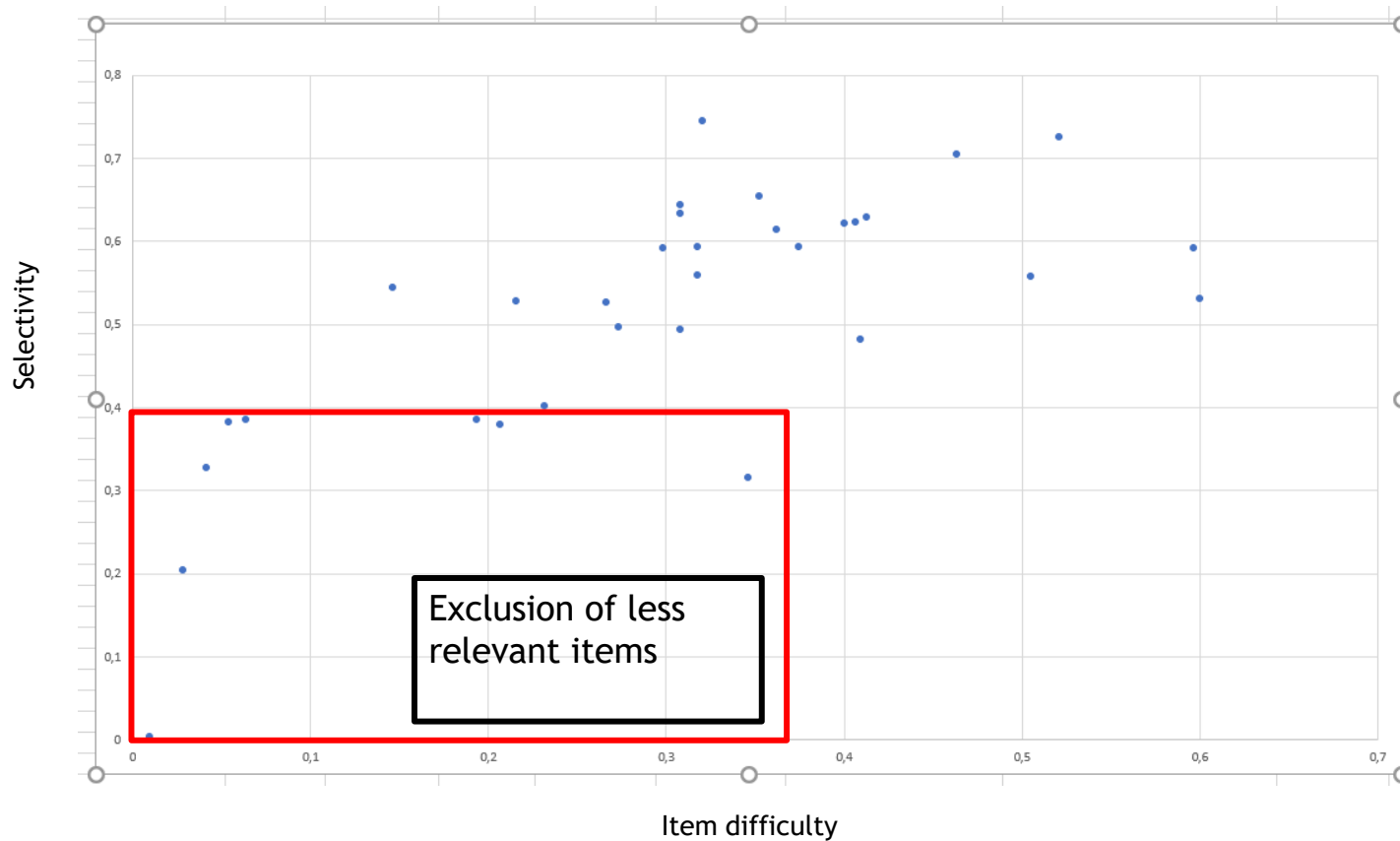
Participants



■ Autistic persons ■ Non-autistic persons

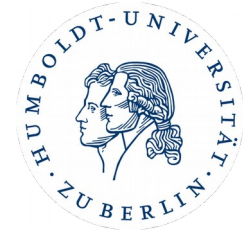


Results: Item selection



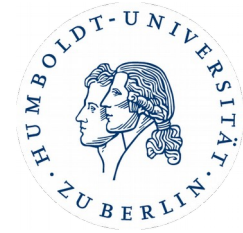


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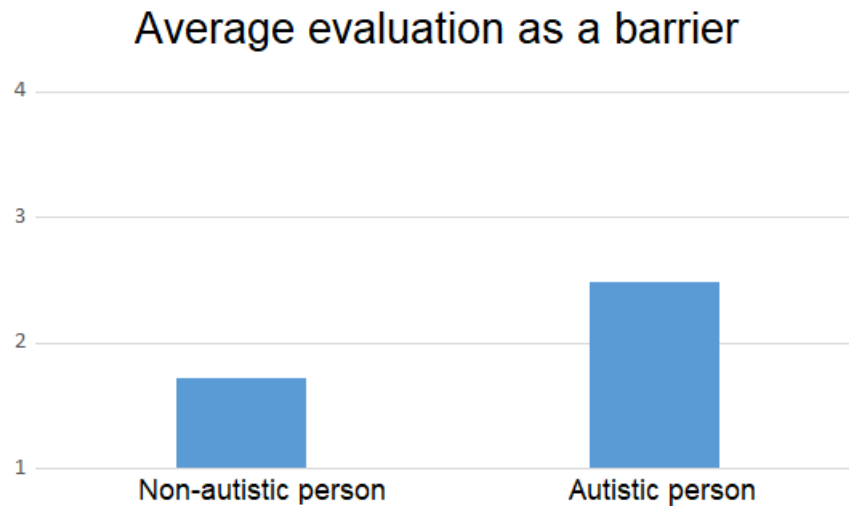


Results: Item selection

- Eight items contributed less to the total value (Selectivity < 0.4) and were excluded: Wind whistling, birds chirping, Raindrops, splashing water, leaves rustling, noises by storm, ticking clocks, water in pipes in buildings
- In the case of noises from nature this was due to the very low probability (0.01 to 0.19) that these noises would be experienced as a barrier at all
- Items that contributed more to surveying “noises as a barrier” were e.g. noises by vehicles, airplanes and construction works but also from mobile phones, clanking dishes, babbling voices and echoing steps through ceilings.
- The measurement accuracy (reliability) of the end version of the questionnaire is high (Cronbach $\alpha = 0.93$)



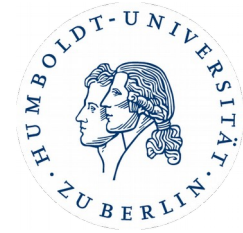
Results: Comparison



- Autistic persons rate noises to a markedly higher degree as a barrier than non-autistic persons do; this is evidenced by a statistical comparison of the two groups (with a 99% probability that the difference is not due to chance)



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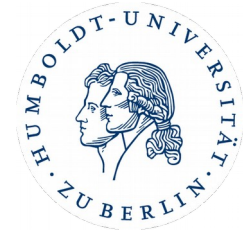


Discussion and outlook

- It was possible to develop a reliable instrument to survey how strong noises are experienced as a barrier
- The difference between autistic and non-autistic persons is evidence for the validity
- Considerations:
 - Before items can definitely be excluded, it should be tested whether they might not be selective nonetheless within the group of autistic participants and it should be considered whether the wording of the question may have been less than perfect
 - The area “nature” may be dropped as natural noises very rarely become barriers



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Discussion and outlook

- A relevant research area for society and politics
- Further development of the total questionnaire (all barriers, if possible) to get reliable and valid measurements
- The aim would be a questionnaire fit for everyday use that can be used to reduce barriers that hinder the participation of autistic people
- Validation for adolescents to ascertain suitability for schools
- Further projects and qualification works within the research alliance with White Unicorn e.V. would be desirable.