

# **Human Response to Sound and Vibrations**

## **Lab 2b - Listening test**

Erik Backman  
Viktor Gunnarsson  
Yagiz Mungan

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## Introduction

Our group created sounds of a “sad ball”, a “ball that makes you sad” and a “rolling ball”. To test how well we succeeded in creating these sounds with the right perceptive attributes, a listening test was set up with four test subjects.

## Method

The listening test was a free association test where the listeners were asked to write down words they think of or emotions they feel when they hear the sounds, see listening test paper in appendix. These words can then be compared to the words that were the source of inspiration when creating the sounds and this should be a good measure of the quality of the produced sounds. The test was single-blind, the subjects didn't know which sound they were listening to and the procedure of playing the sounds was operated from a computer. The subjects could hear each sound as many times they liked.

All sounds of all groups except the group participating in the listening test were played to the subjects, twelve sounds in total.

The subjects were provided with a list of the words used to create the sounds and they could choose both from this list or any other word or phrase they liked. The list is recited below.

- Happy ball / Makes you happy
- Angry ball / Makes you angry
- Fearful ball / Makes you frightened
- Sad ball / Makes you feel sad
- Calm ball / Makes you feel calm
- Rolling ball

A paired comparison test or perhaps an A-B-C-D comparison to save time was considered as an option but since there were quite many sounds to be compared it seemed most straightforward to use a free association test.

## Results

We have put together all the associated words and sentences below. We have also added an explanation of each sound.

### **Sound 1 – Ball that makes you happy**

Heavy, bouncing, rolling away, sad/fearful, makes me angry, strong ball, strong ball, determined ball, a bit angry, bouncing, big, rough surface, longing

### **Sound 2 – Rolling ball from group 2**

Fast, light, happy, in a hurry, sad ball, light ball, happy and untroubled ball, hard surface, angst

### **Sound 3 – Happy ball**

Mad clown bouncing a child ball, frightening, strange, maybe happy, makes me happy, crazy rhythmic ball, Tim Burton ball, surrealistic feeling

### **Sound 4 – Ball that makes you angry**

Tiger roaring, makes me a bit frightened, but just a bit, play backwards, annoying, insecure, afraid, angry ball, impression of that the ball was breathing

### **Sound 5 – Rolling ball from group 1**

Ball that makes me fear, it sounded like a storm, jet plane, ordinary ball, hard ball, thunder, powerful, in charge, unstoppable, maybe a threat, sounds determined

**Sound 6 - Sad rolling ball**

Scary, makes me afraid, fearful ball, sounds like a big round plate rolling on the ground, troubled ball, trapped, I feel stressed, metal, unsafe environment, can be harmful, teenage ball, a bit unsafe

**Sound 7 – Rolling ball from group 5**

Happy ball, happy ball, a sad feeling, basket ball, bouncing ball on plastic surface, high energy/happy

**Sound 8 – Angry ball**

Tempting, fearing, makes me fear, stressed ball, feeling to be in a rush, frightened ball, artificial in the sound, not realistic in the sound

**Sound 9 – Rolling ball that makes you sad**

Dentist drill, calm ball, annoying, fearful ball, calm ball, air seem to go out of the ball

**Sound 10 – Rolling ball from group 4**

Calm, controlled feeling, smooth, sea breeze, calm, calm rolling ball, fast and far away ball, sounds like a plane

**Sound 11 – Ball that makes you calm**

Sounds like a fart, makes me a bit sick, pig fart, unpleasant, makes me wanna trough up, disgusting rolling ball, makes me disgusted, makes me laugh, sound like a fart followed by pee

**Sound 12 – Calm ball**

Rolling ball that makes me calm, mixed feeling of calm and frightened, calming, powerful, might want to harm me, an unreliable ball, makes me insecure

## Discussion

Initially we will investigate how the words and sentences are linked to our own words and sentences, which we used as a base when we designed the three sounds.

For the design of the “sad rolling ball”, we used the words “moving away”, “becoming slower”, “monotonous”, “slow”, “heavy” and “chirp/squeak” as a base during the sound design. As we can see from the result, the test doesn’t show any strong connection between our used words in the design process and the words/sentences which the listener associated to. Actually nobody mentioned anything about a sad rolling ball.

The only similarity between our “base” words and the associations are the word metal, which in a limited extent can be translated to our “chirp/squeak”.

For the design of the “rolling ball that make you sad”, we used the words “low”, “slow/slowly”, “low frequency” and “away from the listener” as a base in the sound design process. Neither for this sound, the “base” words matched the associations received from the listeners. Actually, nobody mentioned anything about sadness. The only thing that fits to or approach the words used during the sound design process is the sentence “air seems to go out of the ball” that one subject wrote down, an impression that we wanted to create since we thought that this could make the listener feel sadness.

We can instead see that associations to a sad ball is experienced for other played sounds, such as for the sounds; “Ball that makes you happy” and “Rolling ball” from group 2. Further on, feelings of sadness due to the rolling ball is experienced for the sound; “Rolling ball” from group 5.

If we evaluate the associations from our design “rolling ball” sound, we found that no one mentioned anything about a rolling ball. Actually, this is the situation for all “rolling ball” sounds. This might be explained with that the association “rolling ball” was too obvious; the

listeners might instead have focused on other associations to the sound. The only word from the associations that is similar to the “base” words is “fast”, i.e. the similarity is poor. The associations in themselves are actually very different to each other, which shows that people associates really differently to this kind of sound, as an example we got both associations of sadness and angst, at the same time as happiness. The observed phenomenon with a wide spectrum of associations is in fact valid for almost all sounds. We think that this might be explained by the fact that the aimed character of all sounds are too abstract, people has difficulties to associate in a similar way since they have probably never met any sad or angry ball before. Anyhow, one has to remember that the result from the listening test is not reliable since the test was done in a very limited scale. The result from our test, with only four participants is therefore extremely poor and unreliable. If such a test should be done in a proper way, one has to have much more participants so the validity of the results gets higher.

As a conclusion from this listening test and the sound design part, we can establish that the design task was really complicated. We did not manage to create sounds which were associated by test subjects to our three different sound characters.

# Appendix

## Listening test

You will now hear 12 different sounds. For each sound, try to write down your spontaneous associations. You will be given a list with a number of possible words/sentences. Feel free to use any word you want! Note that there are no right or wrong answers.

Sound 1

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Sound 2

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Sound 3

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Sound 4

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Sound 5

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Sound 6

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Sound 7

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Sound 8

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Sound 9

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Sound 10

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Sound 11

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Sound 12

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**List of possible words/sentences for associations:**

- Happy ball / Makes you happy
- Angry ball / Makes you angry
- Fearful ball / Makes you frightened
- Sad ball / Makes you feel sad
- Calm ball / Makes you feel calm
- Rolling ball