

Avatar Weight Illusion - The Impact of Embodying Muscular Avatars on Weight Perception of Lifted Objects

Thema:

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Hintergrund

Virtual Reality (VR) provides an immersive environment to investigate different aspects of human psychology. One phenomenon even investigated back at the mind and end of the 19th century evolves around the size-weight illusion. By giving different weights in various sizes to be judged by a human participant, it could be observed that the smaller the object is, the heavier it is estimated. This was reasoned as a mainly mental effect, given that with closed eyes this effect couldn't be reproduced in the same work [1].

With the ability to create immersive environments in VR it can be investigated how strong this effect is when manipulating different variables in regard to the visual stimuli as well as the combination of haptic and visual cues. Research shows, that a higher amount of perceived immersion strengthens this illusion, while also setting different factors like the size and weight into conflict with the help of VR [2].

Another effect which is highly researched is the body ownership illusion, which is induced by visual stimuli of the own avatar towards the player, which makes him feel that he is embodying the avatar [3]. The illusion is often hinted to induce an additional proteus effect, which reflects different effects to the player given the avatar he is embodying [4]. These can be improvements in their strength when

embodying muscular avatars as well as improvements in cognitive tasks when embodying famous intelligent people while doing those [5], [6].

Keeping the effects of the proteus effect in mind, those might not just be investigated around performance aspects but also around the actual estimation and perception of weights parallel to the size-weight illusion. This hypothesis might be supported by psychological studies outside of VR, which showed the effect of assimilated action in regard to estimations [7], [8].

Zielsetzung der Arbeit

The main objective of the work is to investigate different influential factors of the avatar in regard to the estimation of weight. Especially influences on an avatar weight-illusion in reference to the size-weight illusion should be investigated. The main research question Q should be examined: Q: How does the avatars' muscular appearance influence perceived estimation by adjusting visual stimuli via athletic and non athletic avatars?

Given the background around the proteus effect, the following hypothesis H can be formulated and investigated: H: Embodying a muscular avatar results in a lighter estimation of the weight of the presented visual objects.

Konkrete Aufgaben

- Create one or more sample weights (ranging between 20g to 150g)
- Create and conduct a study with different avatars and weights inducing the size weight illusion.
- Usage of questionnaires like IPQ and analyze data from objective measures such as perceived weight, grip force, etc.
- Set data into relation with related studies using the same setup.

Erwartete Vorkenntnisse

- Knowledge in Unity, VR and hardware
- Knowledge in performing studies

Weiterführende Quellen

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