

# Experimental psychology used to investigate spatial perception in the presence of different color tones

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The experimental virtual rooms with their different relative color tone schemes were displayed in 3D to a total of 32 volunteers who were then asked to estimate room height. © Daniel Oberfeld-Twistel

A room will appear to be higher or lower depending on the lightness of the color tones used on ceiling and walls. However, it would seem there is no scientific basis for the old do-it-yourself rule to paint the ceiling in a hue slightly paler than the color used on the walls if you want to create the impression that a room is higher than it actually is. This is the conclusion reached following a study conducted by the Institute of Psychology of Johannes Gutenberg University Mainz (JGU) to investigate the effect of relative brightness of coloration of ceiling, walls and floor on the perceived height of interior spaces.

Dr Daniel Oberfeld-Twistel explains: "In short, although we were able to confirm the popular belief that a pale-colored [ceiling](#) makes a [room](#) appear to be higher, we were surprised to discover that the effect has nothing to do with the contrast in tone between [walls](#) and ceiling. The ceiling does not have to be lighter in color than the walls to make a room seem to be higher." Instead, the [psychologists](#) found that if walls are light-colored this has an additional effect on the apparent height of a room.

Very few studies of the effects of color and tone on spatial perception have been conducted to date. Despite this, many architects and handymen share the view that the way to make a ceiling appear to be higher is to paint it in a lighter color than the walls. Dr. Oberfeld-Twistel and his colleagues examined this phenomenon by generating a [virtual environment](#), in which a room with a floor space of 6 meters by 4.5 meters was furnished with various floors, ceilings and walls. The resultant virtual rooms, with their different relative color tone schemes, were displayed in 3D to a total of 32 volunteers who were then asked to estimate room height.

The lightness of tone of the floor had next to no influence on how volunteers saw room height while the overall lightness of room color had no effect on whether a room was perceived as being higher or lower. "The main factors are the ceiling and the walls", states Dr Oberfeld-Twistel. Further research is to be conducted in order to shed light on the actual psychological mechanism responsible.

In view of their findings, the study authors recommend revision of the widely popular assumptions with regard to the use of color on ceilings and walls. They suggest an alternative guideline that would correspond with the study findings: "In order to make a room appear to be higher, use light color tones on walls as well as ceiling. The color of the floor has no effect on the way that room height is perceived."

**More information:** Surface lightness influences perceived room height, The Quarterly Journal of Experimental Psychology, 16 April 2010, [DOI:10.1080/17470211003646161](https://doi.org/10.1080/17470211003646161)

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