How does visual impairment affect scene perception and object recognition?

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People with visual impairment may experience difficulties in daily activities. Studies have shown an improvement in visual functions after a short period of visual deprivation. However, little is known on scene perception and its relationship with object recognition in low vision. In this study, we examined the performances of object recognition and scene categorization using photographs of real-world scenes in twenty four young adults with normal vision before, immediately after and 2-hour after simulated low vision. Participants were randomly assigned to either mild or moderate simulated low vision groups. For each viewing condition, participants were required to 1) annotate the objects of interests in the photos; 2) label the annotated objects; and 3) report the theme of the scenes. Results showed that with simulated visual impairment, overall performances in object recognition, object annotation and scene perception significantly deteriorated although the levels of deterioration among tasks were different. After 2-hour adaptation, only the accuracy of object annotation improved significantly. Our study suggests some forms of compensatory perceptual changes in visual pathway after short-term visually-deprived adaption. However, this adaptation effect might be more specific to localized object recognition rather than global perception of the scene.