ドローンを用いた高所恐怖症を軽減するためのVRシステムの有効性の検証
Effectiveness of a Drone-based VR System to Relieve Acrophobia.

2010227 LI LINBAI

In recent years, the development of the world economy has made people's lives better and better. With this improved standard of life, our needs are increasing day by day. This is especially true for leisure and entertainment for young people, and their consumption of amusement parks, mountain scenic spots, and urban landmarks is growing. However, they all have one thing in common: the possiblity for exposure to heights is very high. The same is true in people's daily lives. Rapid urbanization has led to an increase in the number of high-rise and skyscraper buildings, which has led to an increase in the number of people working in high-rise and skyscraper buildings. Therefore, in today's society, there are many opportunities for people to be exposed to heights not only for leisure and entertainment, but also in their daily lives. However, not everyone is used to being exposed to heights. People with an acrophobia want to enjoy visiting amusement parks, scenic mountain views, and landmarks in the city center, but they are psychologically unable to do so due to their acrophobia. Furthermore, if they work in an office in a high-rise building, they may experience emotional and physiological reactions such as a strong sense of fear, panic, or increased heart rate in certain situations, which may make it difficult for them to concentrate on their work, resulting in stressful feelings. Therefore, treatment of acrophobia is important to improve the quality of life of those who suffer from acrophobia.

Acrophobia is a common problem, and there are variations of its treatments. Conventional treatments for acrophobias include Direct (in vivo) Exposure Therapy, psychotherapy, and pharmacotherapy. Among these, Direct (in vivo) Exposure Therapy and Virtual Reality (VR) Exposure Therapy are the most widely used. However, VR Exposure Therapy, which is as effective as Direct (in vivo) Exposure Therapy, has become the mainstream therapy, because of its safety and other factors into consideration. The most important thing in VR Exposure Therapy is to maximize the sense of presence and immersion, so that it appears to be a real environment. Therefore, in this study, we proposed an exposure program using a drone to watch live-action videos from the drone's viewpoint with a VR headset, instead of the conventional Computer Graphics (CG) VR Exposure Therapy, and tested its effectiveness in reducing the degree of acrophobia. Specifically, the three experiments were conducted (Replicated Experiment: 5 people, Experiment 1: 10 people, Experiment 2: 16 people), the results of the questionnaire were recorded, and the therapeutic effect of the Aerial VR Exposure Therapy with

drone-shooting videos used in each experiment was evaluated by the changes in the scores of the questionnaire before and after the exposure program.

The results of the experiment showed that the treatment effect was statistically significantly higher for the drone-shooting video than for the CG or live Photos. In addition, it was found that the drone-shooting videos with 360 ° view angle had more effects of the exposure than the drone-shooting videos with 180 ° view angle. Furthermore, it was found that exposure by active viewing, in which the use can control the view angle, showed less likelihood of simulation sickness significantly than exposure by passive viewing.Taken together, these analyses conclude that Omni-Directional Aerial VR Exposure Therapy, which uses a drone and a VR headset to view live like video from the drone's viewpoint, is more effective than the conventional CG VR Exposure Therapy in relaxing acrophobia.

Keywords: Acrophobia, Exposure Therapy, Virtual Reality (VR), Drone.