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Gorini A, Gaggioli A, Riva G.  
Virtual Worlds, Real Healing.  
Science. 2007 Dec 7;318(5856):1549. No abstract available.

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## LETTERS

edited by Jennifer Sills

### Virtual Worlds, Real Healing

IN THE SOCIAL COGNITION SPECIAL SECTION, G. MILLER EXPLAINED how virtual worlds such as Second Life have become a fertile ground for psychologists exploring human behavior ("The promise of parallel universes," 7 September, p. 1341). In addition to the important social applications mentioned in Miller's article, online communities are playing an emerging role in health services.

Compared with the traditional telehealth systems (i.e., chat, e-mail, and videoconference), online virtual worlds provide the remote user, or patient, with a feeling of embodiment that has the potential to facilitate the clinical communication process and to positively influence group cohesiveness in group-based therapies. It may also create higher levels of interpersonal trust (7), which is a fundamental requirement for establishing a successful therapeutic alliance.

Recent evidence has shown that virtual reality-based treatments effectively combat anxiety disorders (2) and allow subjects to develop real-world skills starting from virtual experiences (3). These successes raise the possibility of creating online immersive therapeutic environments for specific disorders. Imagine, for example, a patient with a social phobia who avoids any interaction with other people. After a number of face-to-face sessions with a therapist, the patient can use his personal avatar to explore a virtual environment, such as a virtual pub in which he can ask the barman for a drink. In the following sessions, other people progressively enter the same virtual pub (they can be other patients, for example) and interact with the patient until he can develop efficient social contacts. The therapist can remotely monitor



Virtual therapy. An example of a group support therapy scenario in Second Life.

the patient's psychological, physiological, and emotional responses with the use of biomonitors systems and can modify the intervention on the basis of the therapeutic needs. This is just one example of the promise of virtual worlds in clinical settings.

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#### References

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### The Age-Old Question of Researcher Innovation

UNFORTUNATELY, BOTH Y. BHATTACHARJEE ("The young and the innovative," *ScienceScope*, 21 September, p. 1663) and Jeremy Berg, director of the National Institute of General Medical Sciences, perpetuate the myth that "[e]arly-career types are historically the ones who come up with the most innovative ideas." Though this myth remains popular, the available empirical evidence suggests that middle-aged scientists are (i) more apt than young scientists to make revolutionary discoveries (1, 2) and (ii) more productive than young scientists (3). In fact,

young scientists are not even especially prone to accept a new theory before older scientists (4, 5). It is distressing that funding agencies are making important decisions on the basis of a popular myth that has been examined empirically.

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#### Response

IN HIS LETTER, WRAY POINTS OUT THAT EMPIRICAL data suggests that many revolutionary discoveries are made by "middle-aged scientists." He cites studies that reveal that 24 scientists discussed in Thomas Kuhn's "The Structure of Scientific Revolutions" had a mean age of 37.4 when they made their revolutionary contributions (7) and that a large collection of Nobel laureates had a mean age of 38.7 at the time of their prize-winning discoveries (2). The mean age of the NIH Director's New Innovator Awardees who have just received their first substantial independent research funding from the NIH is approximately 37, somewhat younger than the mean age for new NIH R01 grantees of 41. One of the

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