Differences in Younger and Older Escape Room Participant Experiences: Implications for Stroke Survivors

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Introduction

- Stroke is a common global health problem that primarily effects those above the age of 65 [1] and, although therapies are available, coverage varies based on geographical, ethnic, and socioeconomic groups [2].
- Group-based therapies have been shown to expand coverage through increased patient to therapist ratios and reduced costs while showing similar [3] to greater [4] effectiveness than individual therapy.
- Game-based therapies, specifically exergaming, gaming requiring physical activity, have shown positive motor, cognitive, and social health benefits [5].
- Escape rooms, live action, narrative driven, team-based, time constrained puzzle games, have seen use in educational settings [6] but no literature has explored its rehabilitative potential.
- **Objective: To determine any age related differences in escape room experiences that suggest changes required for stroke survivors and formulate a set of design recommendations for this purpose.**

Methods

- A survey was created through RedCap assessing escape room participants on time pressure, team oriented work, cognitive and motor challenge, and motivation aspects.
- Responses were collected in-person @ the Franklin Institute and through email.
- Questions consisted of Likert-Like Scale, Self Assessment Manikins and Binary questions
- Respondents aged 18-45 → Younger Group (YG)
- >45 → Older Group (OG)

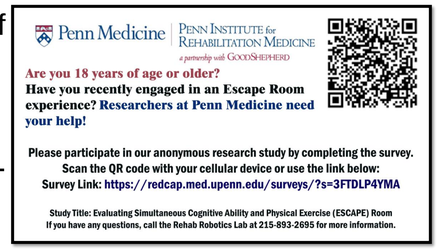

Fig 1: Recruitment flyer containing link and QR code to online survey. All participants were ≥18 years of age.

Results and Design Implications

Subjects
YG (n = 93)
OG (n = 20)
High levels of tech competency and education.

Time
No sig diff in main measure of **rush**. Moderate-high degree of rush.

Teamwork
No sig diff in main measure of **teamwork**. High level of teamwork.

Cognitive
No sig diff in main measure of **cog demand**. Moderate-high degree of demand.

Motor
Sig diff in main measure of **phys demand (↑YG)**. Low degree of phys demand.

Motivation
No sig diffs. Moderate-low frustration. High engagement and pleasure.

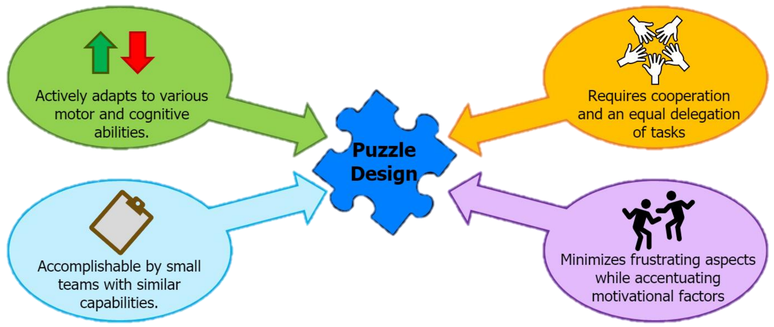

Fig 2. Design recommendations when creating a rehabilitative escape room for post-stroke individuals.

- Lack of many significant differences suggest that there are not many age related differences possibly due to younger age of older adult group (Mean±SD: 53.5 ± 5.9)
- From our results a set of design recommendations (Fig 2, Above) were created to help escape rooms be more inclusive:

***Recommendation 1*: Implement Adaptive Systems**

- Escape rooms incur much more mental rather than physical demand
- Utilize performance-based difficulty adjustment systems that adjust both virtual and physical aspects of robotic-assisted rehabilitation

Design Implications (Cont.)

***Recommendation 2*: Encourage Collaboration and Division of Tasks**

- Escape rooms do not moderate dosage of tasks and respondents cited disorganization and miscommunication as a source of frustration.
- Separate tasks based on narrative roles while encouraging collaboration rather then competition to progress

***Recommendation 3*: Screen Participants into Groups**

- Participants cited “Too many players” as a main source of frustration
- Reduce group size to 3-4 individuals with similar abilities

***Recommendation 4*: Maximize Motivational Aspects**

- Motivation plays a key role in participation and progress in rehabilitation
- Adopt systems (e.g. linearity, clue giving, immersive narratives) to min frustration and max motivation

Conclusions and Next Steps

- Few age related differences in escape room experiences indicate that escape room accommodations should be based on the cognitive and motor challenges typically faced by stroke patients.
- In the future, these design recommendations may be tested through robotic/mechatronic based puzzles before incorporated into a full fledged escape room.

Acknowledgements

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