



## Making Sense of Brain Games: A Scientific Analysis of Game Design in the Brain Fitness Market

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### Our Backgrounds

- » Carrie and Brian
  - » professors at Michigan State University
  - » teach serious game design in the SGD MA program at MSU
  - » developed Brain Powered Games, a suite of 5 brain games, and explored starting a brain game company in 2007
- » Apar
  - » has worked as a game designer
  - » a MA student in our SGD program
  - » this research relates to his in-progress thesis

### Brain Games are Ubiquitous!

- » Since the launch of Nintendo's BrainAge, there have been an explosion of "brain games"
- » Google search for "brain games" yields 21M hits.
- » Sharp Brains 2008 market report studied 20 companies in the brain game market.
- » Brain games span platforms
- » Many are free; some require a subscription or purchase
- » Some are single games, some are integrated suites of games

### Our analysis

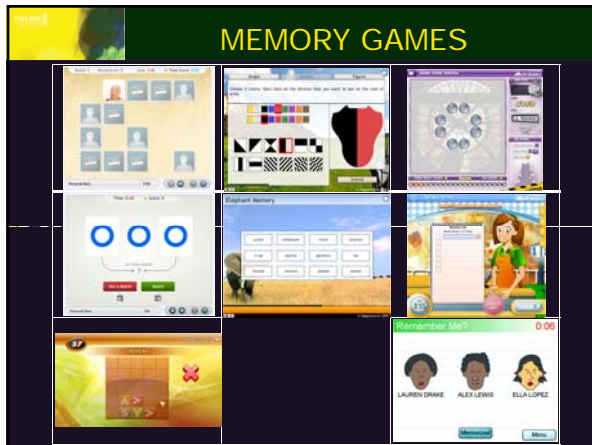
- » Most people ask, do brain games have positive impacts on brain health?
- » This is increasingly supported by research.
- » We ask a quite different question...
- » **How good are brain games, as games?**
- » Disclaimer

### Methods

- » We looked at "best of breed" –
- » Commercial brain game companies offering integrated suites of games
- » Available via the internet (web-based or downloadable). Not console or handheld.
- » Four specialized brain domains (memory, visual spatial, attention, language)
  - ⊗ we used our neurologist's definitions, which usually agreed with company's self classification.
  - ⊗ Excluded executive functioning – too diverse and complex

**The Sample**

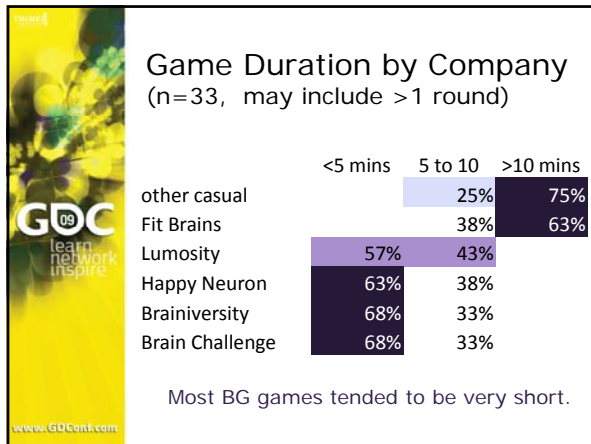
WEB	memory	visual-spatial	language	attention	total
Fit Brains	2	2	2	2	8
Happy Neuron	2	2	2	2	8
Lumosity	2	2	1	2	7
<b>DOWNLOADABLE</b>					
Brain Challenge (#5)	1	1	0	1	3
Brainiversity (#22)	1	0	1	1	3
Big Fish Brain Teasers (#4, #8, #10, #29)	0	2	2	0	4
total	8	9	8	8	33



**Brain Games are Short!**  
(n=29)

	Round
1 minute or less	48%
2 to 4 minutes	48%
5 to 10 minutes	3%
> 10 minutes	

Half had rounds lasting less than 1 minute.




- ### Story in Brain Games (n=29)
- » 1 of 29 brain games had a backstory
  - » (3 of 4 casuals games did)
  - » SCENARIO
    - » 48% none, 38% slight, 14% rich
  - » PLAYER ROLE
    - » 31% had an imaginary player role
    - » 17% an actual player story
  - » 2 of 29 (7%) had a player avatar.
  - » 14% had one or more NPCs.

### Scenario and NPC by Company

	Scenario	NPCs
Fit Brains	87%	25%
other casual	75%	50%
Lumosity	71%	14%
Brainiversity	33%	(trainer)
Happy Neuron	25%	13%
Brain Challenge	0%	(trainer)

2 of 5 BG companies usually used scenarios. NPCs were rare.

### Trainers (n=33)



Brainiversity by Red Sprite Studio

Brain Challenge by Gameloft

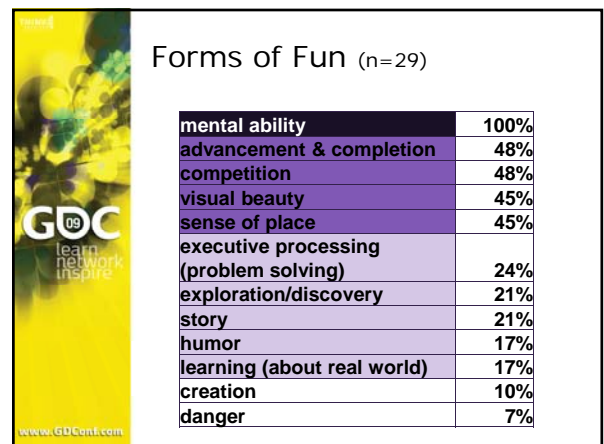
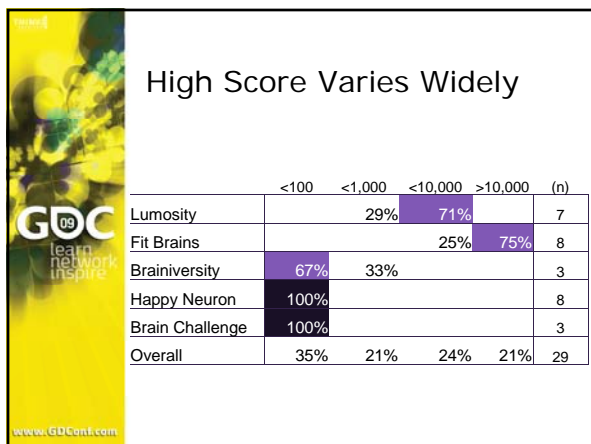
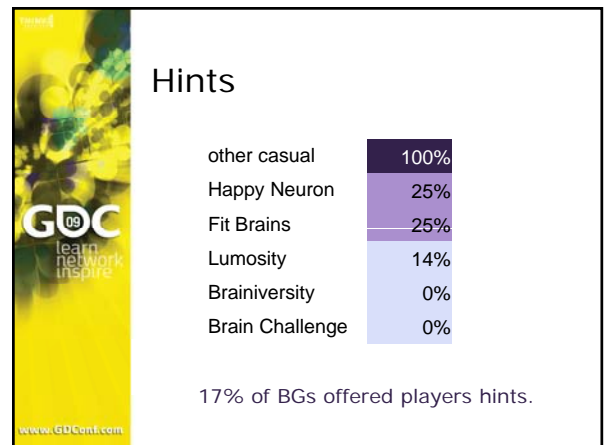
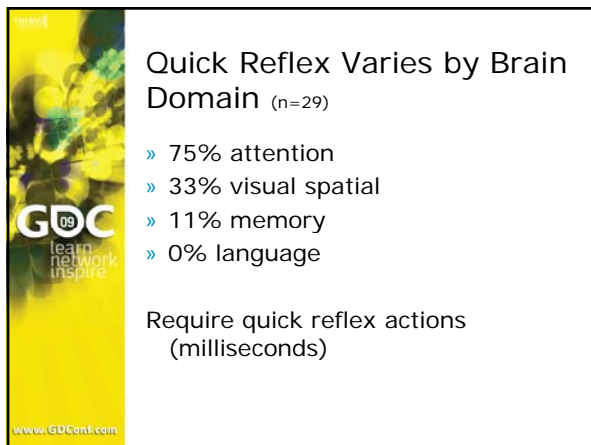
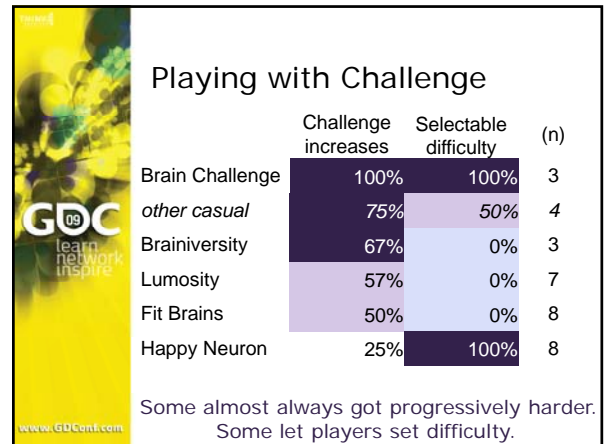
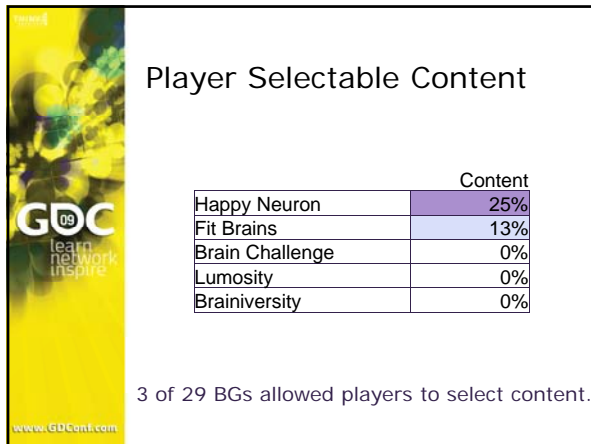
- » Neither downloadable suite used NPCs, but both featured a trainer.
- » Brainiversity's "Edison," is a talking light bulb who made a strange gurgly sound while he "talked".
- » Brain Challenge gave players a choice of M or F brain docs. They were animated, beautifully rendered and spoke in real human voices between games and during game play.
- » No other BGs used a trainer.

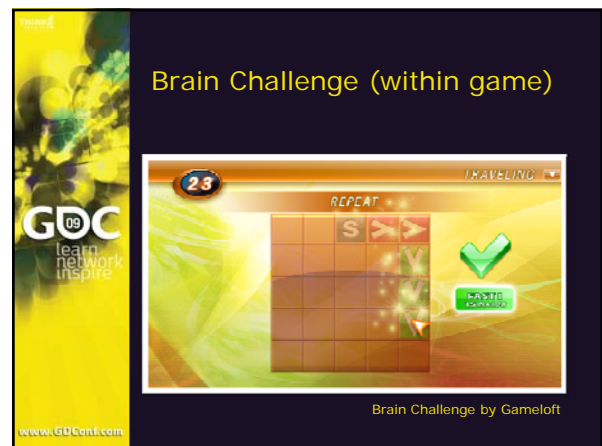
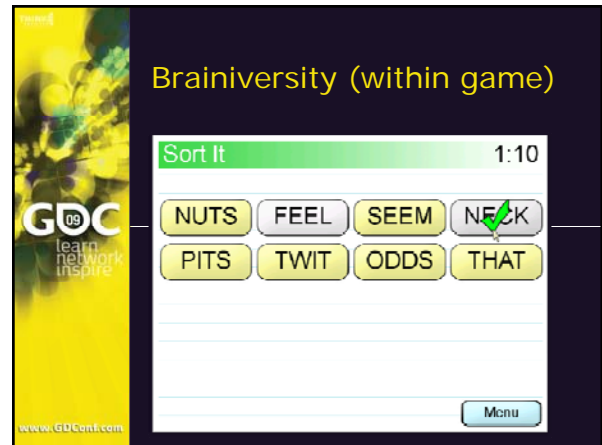
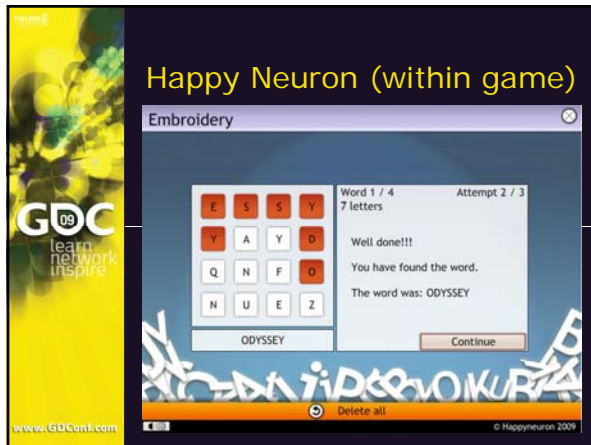
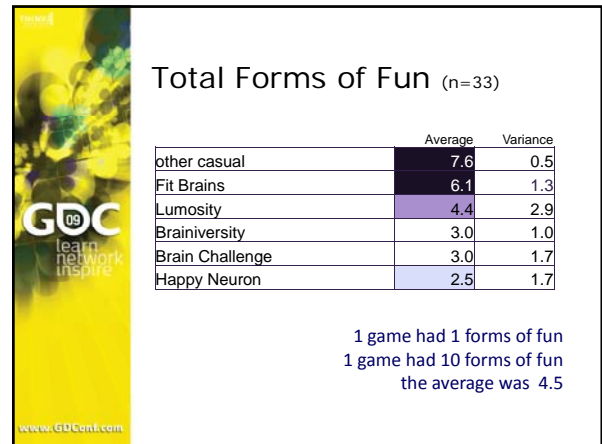
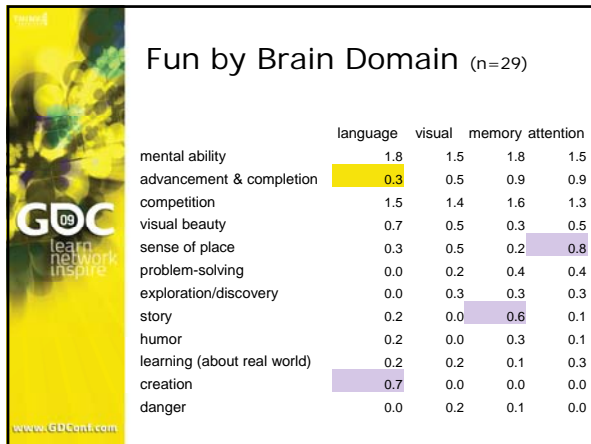
### Soundscapes

	continuous music	sound feedback	plain or pleasing	mood sound effects
other casual	100%	100%	100%	75%
Brain Challenge	100%	100%	67%	33%
Brainiversity	100%	100%	33%	0%
Fit Brains	0%	100%	63%	75%
Lumosity	0%	100%	14%	14%
Happy Neuron	0%	100%	0%	0%

Downloadables used continuous music. 3 of 5 BG companies used plain sounds.

- ### Visual Style (n=29)
- » GRAPHICS
    - » 83% 2D art, 17% 2.5D
    - » 17% realistic, 31% stylized, 52% cartoony
  - » BACKGROUND
    - » 21% solid color or gradient
    - » 21% a photograph
    - » 41% integrated scene
    - » 17% abstract design







**Look and Feel (n=33)**

	Visual Style	Interactivity
casual	3.0	3.0
Fit Brains	2.9	2.6
Brain Challenge	2.7	2.3
Lumosity	2.1	2.3
Happy Neuron	1.5	1.3
Brainiversity	1.0	1.3

**CONSISTENT FEEDBACK**

My own experience with *Headline Clues* illustrates the tension between fitting in to a suite of brain games and making as fun a game as possible.

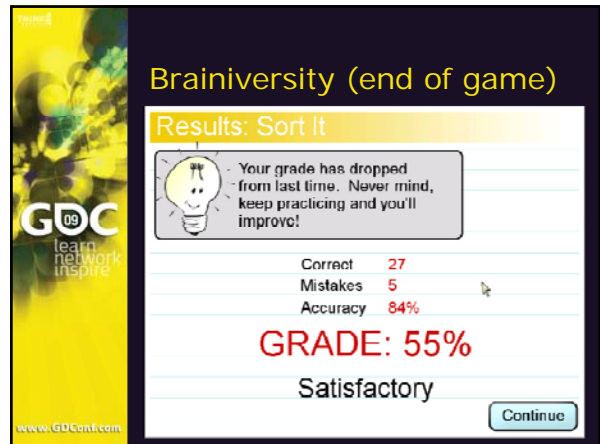
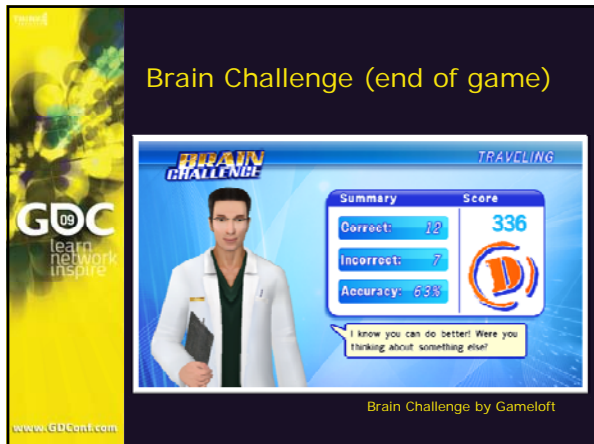
Eventually we abandoned the shared scoring system to customize performance rewards within that one game. Brain game suites can't do that...

**Lumosity (end of game)**

**Fit Brain (end of game)**

**Happy Neuron (end of game)**

Embroidery



We only looked *within* individual games.

- Looking at the many across-game and out-of-game features would be a different study.
- We missed much of the innovation.

Fit Brain example

### Conclusions

- » Casual games are more fun, but maybe not as good for you.
- » The genre is young, it will improve.
- » Companies vary in approach – some are more gamey, some more trainy
- » Scoring in an integrated suite of brain games is restricted by the need for common metrics.
- » More game-like attributes could be easily added – backstory, better sound, more use of hints, more player story.

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