Participant Instructions

Welcome to "Perceptions of Effort and Risk Assessment." My name is [your name], and I will be your administrator today.

Housekeeping

Before we begin, I'd like to give you a moment to silence and put away your cell phones. Please, let me know when you are ready to hear the directions.

> *Note: <u>Wait</u> for nods or verbal agreement before proceeding. If you know a participant did not silence their cell phone, do not be afraid to confront them about it.*

Game Instructions

Today's study will take place in two parts, which we will complete together. That is, we will not move on to the next section until everyone has finished the first part of the study.

The first part of today's study is a 40-minute video game. In this videogame, you will play a young boy who is experiencing a nightmare in which his stuffed animals have turned into zombies. To progress through the game, you must guide your character through each level and eliminate enemies before they cause you harm. This is accomplished using a laser cap gun that you may fire at will. As you hit enemies, they will lose stuffing and make a sound to indicate they've been hit.

Use the arrow keys to navigate through the level, and the mouse to aim and fire the cap gun. Clicking the mouse is the only way to fire your weapon; you cannot hold down the mouse button to fire rapidly. Before we continue, you can take a moment to set up the controls in a way that feels comfortable to you. Feel free to move the mouse to your left hand, if that feels most comfortable.

As you progress through the game, you will notice that a pop-up window will appear at various points during the game. This window will ask you to rate how much more or less challenging the game is now than it was before. Use the slider to indicate, to the best of your ability, how challenging you think that part of the game is. When you have moved the slider, you may click the blue button to continue the game. The game will un-pause about two seconds after you click this button, to give you time to prepare for the game to resume.

You may also notice that your enemies will change in terms of…

- [population] … how quickly they appear in the level.
- [damage] … how much damage they can inflict on your character.
- [strength] … how many hit points they have.
- [line-of-sight] … how close you must be before they can "see," and begin moving towards, your character.
- [speed] … how quickly they move towards your character.

This normal change will occur at the beginning of every level.

During the game, you can track your progress using indicators on the screen: your character's health meter in the lower left corner, a level-tracker in the upper left corner, and a count of the number of enemies you've killed at the top of the screen.

If you die during the game, you will need to wait for the level to reload. Your character will resurrect, fully healed, in a random location within the game level. The number of enemies you've killed will be saved before you are resurrected. You must eliminate 30 enemies before progressing to the next level. Most participants clear 8 levels before the 40-minutes of the study are up.

Are there any questions?

You may now put on your headphones. After you click the button on the screen, you will enter a tutorial level with only three enemies. This is intended to help familiarize you with the

controls and set-up of the game. Feel free to ask any additional questions you may have during this time.

Pilot Testing Protocols

Participants

A total of 31 participants (15 female) from the graduate student body of the Department of Psychological Sciences at Kansas State University completed 15-min or 40-min segments of the experimental task. These students volunteered and did not receive compensation for their participation in the study.

Procedure

Participants completed short, 15-min sessions in each condition of the videogame task (group 1) or completed a full-length, 40-min session in a single condition (groups 2-4). Other than the minor change in session duration for group one, the procedure for these experiments was identical to what was reported in the primary manuscript.

Experimental Manipulation. Task difficulty was manipulated in each condition by changing a single characteristic of the enemy characters' behavior at the start of each level (see Table 2). All other characteristics of the enemy characters' behavior remained the same throughout the session.

Calibration

After collecting each group of calibration data, task difficulty was standardized across condition by subtracting the lowest possible sampling value divided by the sampling range. Performance was defined as participants' damage rate (total lost hit points ÷ time elapsed since last attack). The relationship between these two variables was then graphed and used to determine changes in the random algorithm that manipulated task difficulty at the start of each level. A full disclosure of these changes can be found in Table S1.

Table S1.

Changes in task difficulty made across four pilot studies.

Calibration group	Condition	Sampling values	Fixed values
1 (n = 4)	Population rate	5 – 20 s	10 s
	Damage	5 – 20 hit points	10 hit points
	Strength	90 – 250 hit points	100 hit points
	Line-of-Sight	5 – 26 Unity units	100 Unity units
	Speed	1 – 7 Unity units	3 Unity units
2 (n = 7)	Population rate	1 – 15 s	10 s
	Damage	5 – 75 hit points	35 hit points
	Strength	70 – 300 hit points	185 hit points
	Line-of-Sight	3 – 30 Unity units	100 Unity units
	Speed	1 – 12 Unity units	6 Unity units
3 (n = 6)	Population rate	5 – 15 s	10 s
	Damage	5 – 90 hit points	20 hit points
	Strength	70 – 300 hit points	115 hit points
	Line-of-Sight	6 – 30 Unity units	100 Unity units
	Speed	1 – 10 Unity units	5 Unity units
4 (n = 14)	Population rate	5 – 17 s	10 s
	Damage	10 – 90 hit points	20 hit points
	Strength	70 – 270 hit points	115 hit points
	Line-of-Sight	6 – 30 Unity units	100 Unity units
	Speed	1 – 10 Unity units	5 Unity units

Note. Unity units are an arbitrary programming measure that can be used to scale game objects with respect to one another.

Demographic Questionnaire

Please indicate your gender.

M	F
male	*female*

Please indicate how frequently you've played the following video games over the past 4 years.

First Person Shooters: e.g., Halo, Medal of Honor

0	1	2	3	4
never	*several times a year*	*monthly*	*weekly*	*daily*

Third Person: e.g., Grand Theft Auto, Ratchet and Clank

0	1	2	3	4
never	*several times a year*	*monthly*	*weekly*	*daily*

Role Playing Games: e.g., Final Fantasy, The Sims

0	1	2	3	4
never	*several times a year*	*monthly*	*weekly*	*daily*

Sports Game: e.g., Madden, racing games

0	1	2	3	4
never	*several times a year*	*monthly*	*weekly*	*daily*

Fighting Games: e.g., Street Fighter, Soul Caliber

0	1	2	3	4
never	*several times a year*	*monthly*	*weekly*	*daily*

Multiplayer Online: e.g., World of Warcraft, Everquest

0	1	2	3	4
never	*several times a year*	*monthly*	*weekly*	*daily*

Puzzle and Casino: e.g., online poker, solitaire, minesweeper

0	1	2	3	4
never	*several times a year*	*monthly*	*weekly*	*daily*

Real-time Strategy: e.g., Command and Conquest, Civilization

0	1	2	3	4
never	*several times a year*	*monthly*	*weekly*	*daily*

Musical Games: e.g., Rock Band, Guitar Hero, DDR

0	1	2	3	4
never	*several times a year*	*monthly*	*weekly*	*daily*

Supplemental Tables

Table S1.

AIC model comparisons for the random effect structure of the primary analysis.

Model specification	AIC
Intercept only	2525.43
Intercept and time-in-game	2516.09
Intercept and damage rate since last question	2514.61
Intercept and standardized difficulty	2450.72
Intercept, time-in-game, and damage rate since last question	2497.10
Intercept, time-in-game, and standardized difficulty	**2428.44**