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ORIGINAL ARTICLE

Standardization of a Gaming Image Database for Visual Processing Research

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Main Points

- Ratings on 119 video game images set across 5 different categories: valence, arousal, relevance, urge, and interest are investigated.
- Content validity of the video game image set was demonstrated as gamers had higher image ratings as compared to non-gamers.
- Face validity of the video game image set was demonstrated as participants responded more quickly to video game images compared to control images.
- The video game image set is available for further research assessing cognitive processing of video gaming-related stimuli.

Abstract

The purpose of the current study was to develop a database of gaming photo stimuli to be used in future psychological research assessing behavioral, cognitive, and neural correlates related to gaming. Participants (ages 18-42, N = 549; 43.17% male) completed ratings on 119 gaming-related images across 5 different categories: valence, arousal, relevance, urge, and interest. A measure of gaming addiction was also included. Positive associations between gaming addiction scores and image ratings were predicted. Gamers rated images higher than non-gamers across multiple dimensions including valence (p = .0012), arousal (p < .0001), urge (p < .0001), and interest (p < .0001). Gaming addiction scores were positively associated with image ratings for valence, r = .399, arousal, r = .438, relevance, r = .215, urge, r = .550, and interest, r = .523, p < .0001. Finally, average image ratings for the overall sample ranged from 5.65 (SD = 2.04) to 3.63 (SD = 1.91) for relevance and interest, respectively. These findings suggest that databases of video gaming imagery, rated for valence, arousal, relevance, urge, and interest, could possibly be used in studies assessing cognitive processing of video gaming-related stimuli in individuals with problematic gaming behavior.
Keywords: Eye tracking, gaming, imagery, photo stimuli

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Introduction

Gaming is a popular activity, especially among adolescents, which is inspiring an increasing amount of research. Comparatively, the number of video gamers appears to have increased in the last 5 years. For instance, in 2018, according to Pew Research Center, ~43% of adults in the United States reported playing video games sometimes or often (Pew Research Center, 2018). Recently, the Entertainment Software Association (ESA) reported that ~66% of Americans, or 215.5 million, play video games at least weekly (2022). Worldwide, an estimated 3.38 billion game players are estimated in 2023, contributing to a 187.7-billion dollar (US currency) video game industry (NewZoo, 2023). In 2018, the Pew Research Center showed that more than 84% of teenagers reported regularly playing video games, and 97% of teenage boys reported playing video games on some type of console or device (2018). Video gaming is also equally enjoyed between genders. The ESA in 2022 showed that 71% of children

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play video games, with video game play reported by 70% of men and boys and 62% of women and girls. Video gaming is also reported to have positive impacts on social networking, education, and possible motor and visual spatial skills (Bonnechère et al., 2016; Granic et al., 2014). Overall, gaming appears to be a normative activity for young adults and teenagers.

However, the popularity of video gaming has led to the potential for hazardous, excessive video game play for an increasing number of individuals. A recent meta-analysis of over 400,000 adolescents and young adults from 33 countries found that 9.9% of individuals met criteria for internet gaming disorder (Gao et al., 2022). Other studies with smaller, less representative samples found that over 23% of those who play video games become addicted (Mathews et al., 2019). Hawi and colleagues found that students with gaming disorder slept less and had poorer grade point averages than those who did not. Addictions become more of a problem when the majority of those with such addictions do not seek help (Hawi et al., 2018). Indeed, Campbell et al., found that only 20% of those who expressed video gaming addictions sought help (2017). The International Classification of Diseases (ICD)-11 includes diagnostic criteria for gaming addiction (WHO, 2023). The Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5) lists internet gaming disorder in the appendix for emerging disorders needing further research (APA, 2013; Petry & O'Brien, 2013). An article summarizing the debate of adding video gaming addiction to the DSM reported, "Adding video gaming to the list of recognized behavioral addictions could help millions in need. It could also pathologize a normal behavior and create a new stigma" (Zastrow, 2017).

Although our diagnostic classification systems are considering gaming as a potentially addictive behavior, relatively little research exists on the types of stimuli that might prompt attention, interest, urges, or emotions in people with gaming disorder or in serious gamers. Various cue presentation modalities are used to study neural differences in individuals with highly engaged video gaming behavior as compared to problematic gaming behavior. For instance, Jeromin and colleagues measured reaction time in adults using an addiction Stroop task (2016). Findings showed that video gamers experience longer reaction times when shown computer-related words compared to non-gamers, which can be inferred as an attentional bias toward addiction-related stimuli since they are attending to the computer-related words more. A neuroimaging study by Dong and colleagues utilized functional magnetic resonance imaging to gauge craving responses between individuals who play games recreationally versus those meeting criteria for gaming disorder (2017). Instead of using computer-related words, however, these researchers had participants play a game and measured blood oxygen level dependent change when they were presented with gaming-related images 30 minutes before and after exposure (Zhang et al., 2016). The results indicated gaming disorder is associated with higher craving responses and increased brain activity within several brain structures. Other research has explored various effects of internet gaming disorder (IGD) using a wide array of photo and video stimuli (Antons et al., 2020).

Thus, the visual stimuli (i.e., photos, videos, and words) being used are often unique to the individual studies with little or no overlap between the image sets being used across experiments. However, to better study video gaming behavior, standardized tools such as image databases must be developed and utilized in the research process. A standardized photo image set for video gaming potentially may allow for cross-study comparison of self-reported responses, cognitive, visual processing, and neural correlates similar to other health behaviors such as smoking, alcohol consumption, and eating behaviors (Gilbert & Rabinovich, 1999; King et al., 2020; Stauffer et al., 2017).

The goal of the current study was to use the methodology utilized by Carlson and colleagues to provide ratings on a set of images related to video gaming that can be used for future gaming research (2019). These images were assessed on valence, arousal, relevance, and urge [also see International Affective Picture System (IAPS) for image ratings; Lang et al., 2005]. The IAPS image ratings were chosen as they are comparable to other image sets used in cue-reactivity studies for smoking (Gilbert & Rabinovich, 1999). A second purpose of the current study was to establish content validity and face validity of the photos in the image set. Concerning content validity, we predicted that gamers would have higher image ratings as compared to non-gamers. Positive associations between gaming scores and image ratings were also predicted, similar to other photo image sets (Stauffer et al., 2017). Concerning face validity, we predicted that participants would be able to identify gaming stimuli more quickly than control images.

Material and Methods

Participants

Participants (ages 18 – 42, N = 549; 237 male, 301 female, 11 other (transgender, not sure, declined to state)) were recruited from two large Midwestern universities using the online research recruitment tool, SONA®. Concerning video game characteristics, 59.02% of the sample reported playing at least 1 hour per week (M_{hours} = 6.32, SD_{hours} = 11.59, range 0 – 150 hours). Participants listed their ethnicity as White (70.22%), Asian (3.93%), Black (14.04%), Hispanic (9.74%), or Other Ethnicity (American Indian/Alaska Native, Pacific Islander, Other 2.05%). All procedures were approved by the Institutional Review Board at the University of Minnesota (approval no. 2019/008042), and participants gave informed consent prior to answering the questionnaires.

Materials

Video Gaming Images

The video gaming pictorial images included 119 color images of different video gaming systems (e.g., Nintendo 64, PlayStation Vita, Xbox 360), controllers, game software, and video gaming scenes. Individuals interacting (e.g., playing video games) with the video gaming content were included in 49% of the 119 color images. The video game systems were chosen as gamers with ages 18 – 34, would have experience identifying these gaming systems (ESA, 2019). Images included in the study were produced in the laboratory at Western Illinois University using a Nikon digital camera (Nikon Corp, Tokyo, Japan) with 50 mm f/1.8 G lens or were identified from a Google image search for common license images of video game scenes and associated imagery.

Image Ratings

Participants were asked to complete ratings on 119 video game-related images across five different categories: valence, arousal, relevance, urge, and interest (Lang et al., 2005). Image ratings were on a scale of 1 to 9 with urge and interest assessed on a scale of 1 to 10. Valence was assessed by the question, "Rate this picture based on how happy (pleased, satisfied, contented, and hopeful) or unhappy (annoyed, unsatisfied, bored, melancholic) it makes you feel." Scale anchors included, 1—"This picture makes me feel completely unhappy" and 9—"This picture makes me feel completely happy." Arousal was assessed by the question, "Rate this picture based on how aroused (excited, stimulated, frenzied, jittery, awake) or unaroused (relaxed, calm, dull, sluggish) it makes you feel. Scale anchors included, 1—"I am completely unaroused when I look at this picture" to 9—"I am completely aroused when I look at this picture." Relevance was assessed by the question, "Rate this picture based on how relevant it is to video gaming." Scale anchors included, 1—"Not at all relevant" to 9—"Extremely relevant." Urge was assessed by the question, "If you could play video games freely right now, would you feel no urge to play or the strongest urge to play that you have ever experienced?" Scale anchors included, 1—"I have no urge to play video games" to 10—"I have the strongest urge to play video games that I have ever experienced." Interest was assessed by the question, "Rate this picture based on your interest level (I want to look at this picture. It caught and kept my attention)." Scale anchors included, 1—"No interest" and 10—"Extremely high level of interest."

Video Game Consequences

The Gaming Addiction Scale (GAS) was used to assess video game consequences (Lemmens et al., 2009). The seven-item scale included items that assessed preoccupation, tolerance, mood modification, withdrawal, loss of control, interpersonal conflict, and problems in society. Items were measured on a scale of 1 to 5 with higher scores indicating greater video gaming addiction symptoms. The seven-item GAS demonstrated good internal consistency in the current sample, $\alpha = .853$.

Procedure

Prospective participants were given access to a survey link hosted on Qualtrics® or Survey Monkey®, preferred online survey administration tools at each of the respective universities. Participants were given additional information about the study's purpose prior to providing informed consent. Consenting participants were asked to complete a series of questionnaires and the image rating task which took approximately 30 – 40 minutes. Participants were granted research experience credit for their participation. All procedures were approved by the Institutional Review Board during an anonymous review prior to the onset of data collection.

Results

Demographics

Demographic characteristics of the participants, including age, years of education, and gaming characteristics, are listed in Table 1. Statistical analyses were completed using SAS version 9.4 (SAS Institute, Inc., Cary, NC, USA).

Table 1.
Means and Standard Deviations of Participant Demographic Characteristics

Variable (N = 549)	***M* (*SD*)**
Age (years)	20.01 (2.79)
Education (years)	14.17 (1.23)
Weekly play time (hours)	6.32 (11.58)
Gaming consequences	9.82 (6.96)

Note: Weekly play time was measured using the question "Approximately how many hours per week do you spend playing video games?" Gaming consequences were measured using the Gaming Addiction Scale from Lemmens, Valkenburg, & Peter, 2009 and ranged from 0 to 28.

Video Game Image Ratings

Average image ratings for the overall sample, including gamers and non-gamers, were valence (M = 4.48, SD = 1.43), arousal (M = 3.82, SD = 1.71), relevance (M = 5.64, SD = 2.04), urge (M = 3.72, SD = 1.99), and interest (M = 3.62, SD = 1.91).

Construct Validity of Video Game Images

Content validity was assessed in the current study by associating scores on the Gaming Addiction Scale with valence, arousal, relevance, urge, and interest ratings. Results showed that gaming addiction scores were positively associated with image ratings for valence, r (381) = .399, arousal, r (381) = .438, relevance, r (381) = .215, urge, r (381) = .550, and interest, r (381) = .523, all $ps < .0001$ (Figure 1). Positive associations were an indication of content validity of the video game images as individuals with greater gaming symptoms rated gaming images higher across the five image rating categories. We also assessed if gamers (defined as individuals with one or more hours of playtime per week) had higher image ratings as compared to non-gamers. Results showed that gamers (1 or more hours of gaming per week) rated images higher than non-gamers (valence $t(547) = 3.24$, $p = .0012$; arousal $t(546) = 4.20$, $p < .0001$.

Urge $t(546) = 6.78$, $p < .0001$; interest $t(546) = 6.18$, $p < .0001$). Both gamers and non-gamers found images relevant (n.s., $p = .104$). See Table 2 for means and standard deviations of image ratings for gamers and non-gamers.

Face Validity of Video Game Images

For the face validity study, 20 images with the highest ratings for relevance, urge, and interest, were chosen and paired with another neutral household items that matched the gaming image as closely as possible without including video game content. Data were collected as part of a separate study on eye tracking.[26] Images were presented side-by-side on the screen and were sized 575 × 475 pixels when displayed on the computer screen. Images were counterbalanced for side of screen and image pairs were presented in randomized order. During the paired image study, participants (n = 19; 82% male) were instructed to respond as quickly but as accurately as possible to either the video game or the neutral image. Following, a paired samples t-test was used to assess reaction time for participants' response to video game images, compared to neutral images. Reaction time differences between video game (M = 657.71 ms, SD = 80.04) vs. neutral image (M = 735.08 ms, SD = 106.69) were significant, with video game images

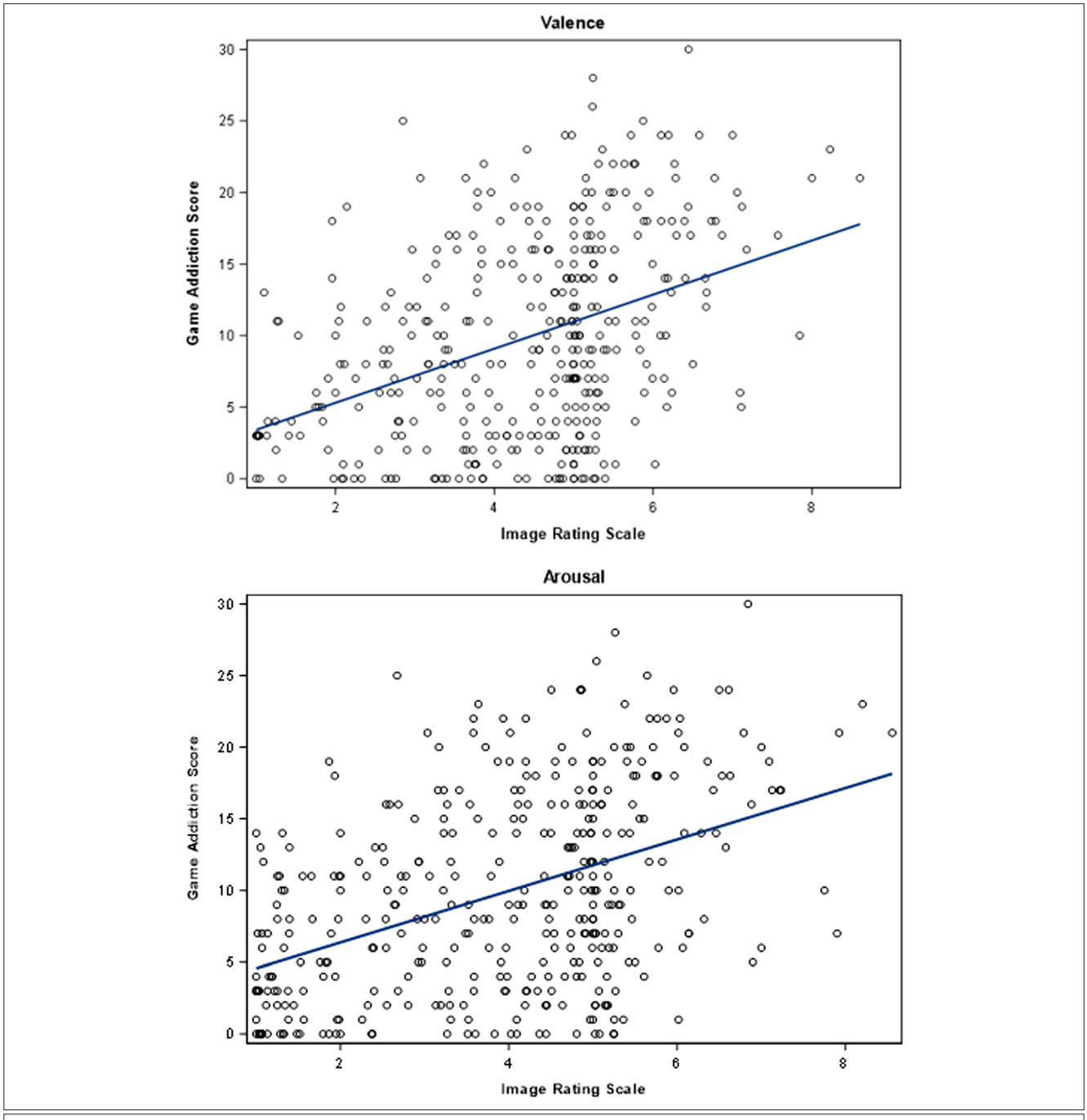

Figure 1. Association of Game Addiction Scores and Image Ratings. Note. Participant ratings of valence and arousal on the video game image set were associated with gaming addiction scores, $p < .0001$.

identified faster than neutral images, $t(18) = 4.26$, $p < .001$. See Figure 2 for sample matched pair in the paired image study.

Discussion

We developed a video gaming image set of 119 images of both animate and non-animate images. The image set includes controllers, equipment, and video game scenes. Participants rated video gaming images on valence, arousal, relevance, urge, and interest using a 9-item Likert scale (Lang et al., 2005). In this sample of gamers and non-gamers, relevance ratings were the highest in the image set overall; whereas, overall, interest in video game images was the lowest. The ratings are comparable to other image sets used in cue-reactivity studies for smoking (Gilbert & Rabinovich, 1999). Average ratings across participants for each image for valence, arousal, relevance, urge, and interest are included as supplementary material.

One purpose of the current study was to establish content and face validity from the ratings of the video game photo image set and other self-reported video game behavior. Regarding content validity, the current paper demonstrates that participants with greater gaming addiction scores had higher game image ratings for valence, arousal, relevance, urge, and

Table 2.
Means and Standard Deviations of Image Ratings for Gamers and Non-Gamers

	Weekly Gaming	
	<1 Hour per Week	≥1 Hour per Week
	(*n* = 226)	(*n* = 326)
Variable	**Mean (*SD*)**	**Mean (*SD*)**
Valence[a]	4.24 (1.47)	4.64 (2.10)
Arousal[b]	3.45 (1.77)	4.07 (1.41)
Relevance	5.47 (2.19)	5.76 (7.82)
Urge[c]	3.05 (1.95)	4.18 (1.89)
Interest[d]	3.04 (1.87)	4.03 (1.84)

Note: Image ratings were from the International Affective Picture System from Lang, Bradley, & Cuthbert, 2008. Ratings were on a scale of 1 – 9, with urge and interest assessed on a scale of 1 – 10.
[a]Differences between weekly gaming [<1 hour per week, ≥ 1 hour per week] significant, $t(547) = 3.24$, $p = .0012$.
[b]Differences between weekly gaming [<1 hour per week, ≥ 1 hour per week] significant, $t(546) = 4.20$, $p < .0001$.
[c]Differences between weekly gaming [<1 hour per week, ≥ 1 hour per week] significant, $t(546) = 6.78$, $p < .0001$.
[d]Differences between weekly gaming [<1 hour per week, ≥ 1 hour per week] significant, $t(546) = 6.18$, $p < .0001$).

interest. Importantly, these results demonstrate that the photo images in the video game image set are recognizable to millennial gamers and at least representative of the video gaming industry. The results are consistent with those using eye tracking measurement, an objective measurement of preference for video games vs. neutral stimuli (Gilbertson et al., 2022). In the study of Gilbertson and colleagues, participants with greater gaming addiction scores had greater dwell time and quicker initial fixation on video game images vs. control images during an eye tracking task. Thus, evidence from the current study and that of Gilbertson and colleagues supports the content validity for the gaming image photo through both self-reported (i.e., subjective) and objective (e.g., eye-tracking) measures. Importantly, although gamers report various preferences for the game genre and number of players and a preference for offline versus online play, the gaming photo image set contains images that video game players find relevant and arousing (Leff et al., 2017). Indeed, a preliminary study demonstrated that following completion of an eye-tracking task utilizing gaming image stimuli, participants with higher gaming scores scored higher on an urge self-reported scale used to measure craving (Eberhardt, 2020).

For face validity, the subset of images was distinguishable from control images in a reaction time task where participants were instructed to respond as quickly and as accurately as possible to either the video game or control images. For the face validity task, matched images were developed for the animate and non-animate video game images. These include the same size, shape, particularly hand position, but are devoid of video game content. Blocks were counterbalanced (for responding to either the video game or control image) and target images were randomized for the left or right side of the screen during the task (Eberhardt et al., 2019). Participants responded more quickly to the gaming images as compared to the neutral images during the paired task, demonstrating that millennial gamers can recognize and distinguish the images in the gaming photo image set. To our knowledge, this is the first validated video game image set that includes both animate and non-animate images of controllers and video game scenes.

There are some limitations. While the gaming addiction scores ranged from 0 to 30, it is possible that we did not sample from moderate or severe populations. However, it should be noted that 26% of the sample in the current study met the criteria of scoring at least a three (sometimes) on a 5-point scale, for two items listed in the seven-item Gaming Addiction Scale (Lemmens et al., 2009). Future studies may consider including additional participants who exhibit more video game consequences. Additionally, while we consulted with video gamers in developing the image set, we did not collect data specifically on recognition of controllers or game systems. Gamers, ages 18 – 34 would have experience identifying the gaming systems; thus, these were included in the image set. Thus, although we strived to include several types of representative controllers and video game scenes, we may have inadvertently omitted a desired image.

In conclusion, the purpose of the current study was to validate an image set to be used in further gaming cue-reactivity studies. The validated image set and an enhanced set have been prepared for research measuring behavioral responses as well

Figure 2. Sample stimuli from the video game image set. Note: Sample of matched gaming (left, gaming system) and non-gaming (right, briefcase) stimuli from the video game image set used during the face-validity paired image study. Participants identified video game images more quickly than neutral images, $p < .001$.

as physiological recordings like electroencephalography and pupillometry. The original image set, matched images, and an enhanced image set are available upon request from the corresponding author. Using this standardized image set in future research involving video game use and misuse will help to clarify and unify the science, like other research areas using standardized image sets.

Ethics Committee Approval: Ethics committee approval was received from the Institutional Review Board of University of Minnesota during an anonymous review (approval no. 2019/008042, dated November 14, 2019).

Informed Consent: Informed consent was obtained from participants who agreed to take part in the study.

Peer-review: Externally peer-reviewed.

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Genişletilmiş Özet

Görsel İşleme Araştırmaları İçin Oyun Oynama Görüntü Veritabanının Standartlaştırılması

Giriş

Video oyunu oynayanların sayısı son beş yılda artış göstermiştir. Örneğin, 2018 yılında Pew Araştırma Merkezi'ne göre, Amerika Birleşik Devletleri'ndeki yetişkinlerin yaklaşık ~%43'ü ara sıra veya sık sık video oyunları oynadığını bildirmiştir. Ancak yakın zamanda, Eğlence Yazılımları Derneği (ESA), Amerikalıların yaklaşık ~%66'sının veya 215,5 milyonunun en az haftada bir video oyunu oynadığını bildirmiştir. Dünya genelinde yaklaşık 3,38 milyar video oyunu oyuncusunun 187,7 milyar dolarlık (USD) bir endüstriye hizmet ettiği tahmin edilmektedir. Bununla birlikte, ciddi oyuncular arasında dikkat, ilgi, dürtü veya duyguları tetikleyebilecek uyaran türleri hakkında çok az araştırma bulunmaktadır.

Aşırı video oyun oynama davranışı gösteren bireylerde nöral farklılıkları incelemek için çeşitli sinyal gönderme modaliteleri kullanılmaktadır. Araştırmacılar, oyun oynama bozukluğu olan bireyler ile kontrol gurubundaki katılımcılar arasındaki benzerlik ve farklılıkları araştırmak için Stroop bilişsel görevinde video oyunu kelimeleri, video oyunu oynama, laboratuvarda geliştirilen işaret fotoğrafı uyaranları veya video uyaranları kullanmaktadır. Mevcut çalışma, sorunlu video oyunu oynamanın bilişsel, sinirsel ve davranışsal öncüllerini ve sonuçlarını araştıran araştırmacılara 119 video oyunu görüntüsünden oluşan standart bir görüntü seti sağlamak için duygusal bir sınıflandırma sistemi kullanmaktadır.

Yöntem

İlk amaç olan görsel bilgi işleme araştırması için 119 video oyunu görüntüsünün duygusal derecelendirmelerini sağlamak, oyun oynayan ve oynamayan kişilerde (18-42 yaş, N= 549; %43,17 erkek) değerlendirilmiştir. Duygusal derecelendirmeler beş farklı kategoriyi içermektedir: Valans, Uyarılma, Alaka, Dürtü ve İlgi. Derecelendirme ölçeği, duygu araştırmalarında kullanılan standartlaştırılmış bir resim olan Uluslararası Duygusal Resim Sistemi'nden (IAPS) uyarlanmıştır. Nikotin kullanımını içeren benzer çalışmaların sonuçlar ve duygusal derecelendirmeler arasında pozitif bir ilişki olduğunu gösterdiği göz önünde bulundurulduğunda, içerik geçerliliğinin bir ölçüsü olarak oyun bağımlılığı puanlarının görüntü derecelendirmeleriyle bağlantılı olacağını öngördük. Ayrıca, yüz geçerliliğinin bir ölçüsü olarak, katılımcıların oyun görüntülerini kontrol görüntülerinden daha hızlı tanımlayabileceklerini öngördük.

Bulgular

İçerik geçerliliği ile ilgili olarak, bulgular oyun bağımlılığı puanları ile fotoğraf uyaran setindeki 119 video oyunu görüntüsünün duygusal derecelendirmeleri arasındaki pozitif ilişkiyi desteklemiştir. Oyun oynayanlar, oynamayanlara kıyasla 119 video oyunu görüntüsünde daha yüksek duygusal derecelendirmelere sahipti. Yüz geçerliliği ile ilgili olarak, katılımcılar ayrıca oyun görüntülerini kontrol görüntülerine kıyasla daha hızlı tespit etmişlerdir. Son olarak, 119 video oyunu görüntüsünün duygusal derecelendirme aralığı, sigara içme görüntülerini içeren önceki çalışmalara benzerlik göstermiştir.

Tartişma

Video oyunları, özellikle ergenler arasında popüler bir eğlence aktivitesi olmasına rağmen, beyin görüntüleme, elektroensefalografi (EEG), bilişsel veya göz izleme yöntemleri kullanılarak işaret-reaktivitesini değerlendiren çalışmalarda kullanılan görsel uyaranlarla ilgili standardizasyon eksikliği vardır. Amerikan Psikiyatri Birliği henüz *Ruhsal Bozuklukların Tanısal ve Sayımsal El Kitabı'na* (DSM-5; Amerikan Psikiyatri Birliği, 2013) oyun bozukluğunu eklemediğinden, video oyunu davranışıyla ilgili araştırmaları ilerletmek için görsel uyaranların standardizasyonuna ihtiyaç vardır. Video oyunları için standartlaştırılmış bir fotoğraf görüntüsü seti, sigara içme, alkol tüketimi ve yeme davranışları gibi diğer sağlık davranışlarına benzer şekilde, kendi kendine bildirilen yanıtların, bilişsel, görsel işleme ve sinirsel korelasyonların çapraz çalışma karşılaştırmasına olanak tanıyabilir.

Bu çalışmanın amacı, gelecekteki oyun oynama araştırmalarında kullanılabilecek video oyunlarıyla ilgili bir dizi görüntü üzerinde derecelendirme sağlamak için standartlaştırılmış metodoloji kullanmaktı. Bu görüntüler Valans, Uyarılma, Alaka ve Dürtü açısından değerlendirilmiştir. IAPS görüntü derecelendirmeleri, sigara içmeye yönelik işaret-reaktivite çalışmalarında kullanılan diğer görüntü setleriyle karşılaştırılabilir oldukları için seçilmiştir.

Bu çalışmanın bir diğer amacı, video oyunu fotoğrafı görüntü setinin derecelendirmelerinden ve kendiliğinden bildirilen diğer video oyunu davranışlarından içerik ve yüz geçerliliği sağlamaktı. İçerik geçerliliği ile ilgili olarak, mevcut makale, daha yüksek oyun bağımlılığı puanlarına sahip katılımcıların valans, uyarılma, alaka, dürtü ve ilgi için daha yüksek oyun görüntüsü derecelendirmelerine sahip olduğunu göstermektedir. Sonuçlar, nötr uyaranlara karşı video oyunu tercihinin objektif bir ölçümü olan göz izleme ölçümünü kullanan literatürdeki bulgularla tutarlıdır. Dolayısıyla, mevcut çalışmanın bulguları, oyun oynayan kişilerin oyun oynama imajı fotoğrafları için öznel olarak kendi bildirdikleri daha yüksek imaj derecelendirmelerine sahip olduklarını göstererek literatürde daha önce rapor edilen bulguları tamamlamaktadır.

Mevcut çalışmada yüz geçerliliği de incelenmiştir. Yüz geçerliliği görevi için, hareketli ve hareketsiz video oyunu görüntüleri için eşleştirilmiş kontrol görüntüleri geliştirilmiştir. Görüntüler aynı boyut, şekil ve özellikle el pozisyonunu içermekle birlikte video oyunu içeriğinden yoksundur. Bloklar (video oyunu veya kontrol görüntüsüne yanıt vermek için) dengelenmiş ve görev sırasında hedef görüntüler ekranın sol veya sağ tarafı için rastgele seçilmiştir. Katılımcılar, eşleştirilmiş görev sırasında nötr görüntülere kıyasla oyun görüntülerine daha hızlı yanıt vererek, oyun oynayan kişilerin oyun fotoğrafı görüntü setindeki görüntüleri tanıyıp ayırt edebildiğini göstermiştir. Bildiğimiz kadarıyla bu, kontrolörlerin ve video oyunu sahnelerinin hem hareketli hem de hareketsiz görüntülerini içeren ilk doğrulanmış video oyunu görüntü setidir.

Sonuç olarak, bu çalışmanın amacı, ileriye dönük oyun işaret-reaktivite çalışmalarında kullanılacak bir görüntü setini doğrulamaktı. Orijinal görüntü seti, eşleştirilmiş görüntüler ve geliştirilmiş görüntü seti, talep üzerine ilgili yazardan temin edilebilir.