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ATTENTION, EXPOSURE DURATION, AND EMOTIONS: INCREASED PLEASURE AND HABITUATION

Trifu Dănuț [*],
Marketing Faculty,
University of Economic Studies, Bucharest, Romania.

Stan (Bizon) Claudia Cristina,
Marketing Faculty,
University of Economic Studies, Bucharest, Romania.

[*] **Corresponding Author: Trifu Dănuț**

ABSTRACT

A more pleasant stimulus is more likely to attract increased attention and, in the consumer behavior framework, to be chosen. But its intrinsic characteristics left alone, would more exposure duration and attention make a visual image more pleasant? Whether we are talking about a product image on a website, a video clip, or packaging, marketing practitioners from branding agencies to designers try to produce the most pleasing offerings for their target audience, and they are right to do so. More often than not, however, competitors would quickly cause most stimuli in a given category to become of average intensity and value, and radical changes cannot be done too frequently. The present study examined the extent to which the duration of exposure and *attention to stimuli (images from the Open Affective Standardized Image Set) of slightly above and below average valence modulate the emotions these stimuli generate. Exposure duration varied between four and eight seconds, and electroencephalography (EEG)-based metrics values were used for attention, valence, and intensity; for the last two, self-answers were also used. For images of above the average starting valence, attention was highly correlated with intensity and valence, whether measured or self-reported, and so was the exposure duration. For negative intrinsic valence images, increasing duration increased self-reported valence and decreased self-reported intensity, while attention positively correlated with both intensity and valence, measured and self-reported. Even if some correlation coefficients failed significance tests, the results suggest that simply increasing the duration of exposure and the attention given to a stimulus can improve the emotions it elicits.*

Keywords: Attention, Exposure Duration, Emotional Valence, EEG, Consumer Behavior, Visual Stimuli, Habituation, Affective Response, Stimulus Intensity, Image Perception, Neuromarketing, Pleasure and Emotion.

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1. Introduction

After capturing and maintaining attention, obtaining a positive emotion for the presented offer is both a fundamental concern of marketing practitioners and a stage of current and traditional models of approaching consumer behaviour (Richins, 1997; Johnson and Stewart, 2005; Plassman, Ramsøy, & Milosavljevic, 2012; Hoyer, MacInnis, & Pieters, 2024).

Both attention and emotions have been intensively researched in Psychology, Medicine, and Neuroscience in recent decades, but their complete understanding is not in sight. However, from the many proposed paradigms, two seem to gain ground in consumer neuroscience: top-down and bottom-up attention and valence and intensity for emotions. The first is straightforward: bottom-up attention refers to the situation when a stimulus, be it internal (such as a sudden headache) or external (such as a flash of light in the dark), makes us attend to it at the expense of other cognitive processes; the second refers to situations in which one voluntarily attends to processing stimuli regardless their intrinsic salience, such as reading a book one has to read, no matter how captivating or boring it is. There are brain structures and circuits proven to be associated with each of these two types of attention - a consensus exists for the superior colliculus and the pulvinar nucleus of the thalamus as being responsible for the dynamic control of attention. In contrast, structures such as the dorsolateral prefrontal cortex, the posterior parietal cortex, and the intraparietal sulcus are activated for modulating top-down attention, and the ventral frontal cortex, temporoparietal junction, the anterior cingulate cortex, and the anterior insula are activated to attend and orientate toward salient stimuli (Fiveable, 2024). Nevertheless, different brain structures will be activated depending on the senses the stimulus is salient in, and new structures are discovered to process various types of external and internal sensorial input (Liang, Mouraux, & Iannetti, 2013), but also to facilitate better processing of ones at the expense of others (Bisley, 2011; Frank et al., 2020). Finally, all brain structures, including the previously mentioned ones, are involved in the modulation of several cognitive or emotional states. Valence and intensity of emotion (also referred to as interest or pleasure, for valence, and excitement or arousal, for intensity) have followed a similar route, appearing first as empirical and theoretical notions (Schlosberg, 1952; Russel & Mehrabian, 1974; Russel, 1980), subsequently validated by imagistic studies revealing brain areas indicative of each of these dimensions of an emotional state; to name just a few - the medial orbitofrontal cortex for valence, (Sescousse, 2010), the superior right angular gyrus, insula, amygdala, and medial prefrontal cortex (Résibois et al., 2017). Although more characteristics of emotions were proposed to allow for a better differentiation (Scherer, 2005), most of the current developments – including the EEG metrics used in this material and the OASIS approach are based on the two-dimensional space of valence-intensity. Efforts were redirected from identifying and operationalizing additional emotions' characteristics to investigating short-term (from milliseconds to seconds) emotional responses to stimuli with EEG (Granjean & Scherer, 2008; Weinberg & Hajcac, 2010) and identifying in detail more brain structures and their roles in emotions modulating with functional magnetic resonance imaging - fMRI (Verduyn et al., 2015, Waugh et al., 2016). Although quite effective in detecting and evaluating various emotional and cognitive states (Byrne et al., 2022; Yu et al., 2023), EEG-based metrics are far from perfect in the described context. They do offer non-neuroscience specialized researchers in various social sciences access to compelling insights by calibrated metrics: linking EEG readings to purposefully elicited states via various artificial neural networks, then testing the models on new data. There are several alternative published techniques for eliciting and modulating emotional and cognitive states (Pacheco, Garcia, & Reynes, 2018; Mashail, Malak,

& Mohammed, 2024), while PyTorch allows for a flexible configuration, training, and testing of neural networks using some thousands of data-sets (Trifu, Goga, & Bostănică, 2024).

The study of the bivalent relationship between attention and emotions has led to numerous applications in psychology and the medical world (Wadlinger & Isaacowitz, 2008; Wadlinger & Isaacowitz, 2010; Stewart & Paulus, 2013). For Neuromarketing, one of the best-known consensuses is the "mere exposure effect" (Zajonc, 1968), linking repetitive exposures to a stimulus to a more favorable attitude towards it. Numerous studies confirmed this relationship, the self-reported positive valence increasing even after as many as 20 exposures (de Zilva et al., 2013). The impact of exposure duration on emotion has a much wider value range across studies, from positive (Peskin & Newell, 2004) to negative (Rashidi, Pazhoohi, & Hosseinchari, 2012) for the same type of stimuli – in this case, human faces; while these projects relied on self-reported values, others were interested in time intervals of as low as 0-48ms (Seamon, Marsh, & Brody, 1984). Not only have standardized positive, neutral, and negative stimuli been investigated, but also ones of extreme intrinsic valence and intensity; Dijksterhuis & Smith (2002) found that subliminal exposures to these stimuli bring the emotions they generate to more common values. Attention is generally accepted to improve the emotions stimuli generate, although differences do exist between various types of stimuli (Mrkva, Westfall, & Van Boven, 2013; Shao, Li, & Ren, 2023).

The present project investigated the relationships between exposure duration, attention, valence, and intensity in the ranges of interest for consumer behavior: four to eight seconds, standard stimuli of slightly negative and slightly positive valence. Self-reported values were supplemented and analysed in comparison to EEG metrics recorded values.

2. Method

Four pictures were selected from the Open Affective Standardized Image Set (Kurdi, Lozano, & Banaji, 2016); their mean valence and intensity, as well as standard deviations and number of observations, are presented in Table I: Open Affective Standardized Image Set (OASIS) pictures.

Table I: Open Affective Standardized Image Set (OASIS) pictures

Image	OASIS ID	Source	Valence mean	Valence SD	Valence N	Arousal mean	Arousal SD	Arousal N
1	I125	Wikipedia	4.40	1.08	101	3.69	1.8	103
2	I124	Wikipedia	4.37	1.07	101	3.59	1.81	103
3	I117	Pixabay	1.97	1.01	108	4.09	1.84	104
4	I121	Wikipedia	1.99	0.83	101	4.21	1.88	103

33 respondents were exposed to these images for durations of four, six, and eight seconds; all pictures had similar distributions for order of appearance and exposure time. The difference between intensity and valence was explained to all respondents; participants were then asked to report the values induced by each image, while the metrics for attention, valence, and intensity calculated by the Emotiv Pro based on the sensors data from an Emotiv Epoc X EEG headset were recorded. As OASIS data are from a 7-point Likert scale while a 10-point one was used in this study for the self-reported measures, we arithmetically converted OASIS means into “OASIS Converted”, for ease of comparison. Correlation coefficients were computed between exposure Time, Measured Attention, Measured Valence, Self-reported Valence, and Self-reported intensity, respectively. These values were computed and tested for statistical significance on the entire data set and, separately, for the results related to the below-average variance pictures and the above-average ones. Note that Emotiv computed values are presented on a 100-point scale.

3. Results

First, the present study’s results on valence and intensity were compared with the ones in OASIS, as presented in Table 2: Measured and self-reported means of valence and intensity, for an indication of process accuracy.

Table 2: Measured and self-reported means of valence and intensity

	Measured			Self-reported			OASIS
	4 seconds	6 seconds	8 seconds	4 seconds	6 seconds	8 seconds	Converted
Valence Image 1	61.91	64.91	65.73	6.27	6.36	6.27	6.29
Valence Image 2	60.64	63.91	66.09	5.73	6.45	6.36	6.24
Valence Image 3	43.64	46.45	48.09	2.55	3.18	3.27	2.84
Valence Image 4	44.00	46.55	48.45	2.55	3.09	3.36	2.81
Intensity Image 1	53.36	58.00	58.45	4.82	5.82	5.73	5.27
Intensity Image 2	51.82	56.55	57.55	5.18	5.55	5.82	5.13
Intensity Image 3	52.09	61.82	61.64	4.73	4.27	4.19	6.01
Intensity Image 4	51.91	60.18	61.18	4.09	3.91	3.82	5.84

Then, the correlation coefficients and their computed t-values were obtained across all observations to compare with the critical scores; correlation coefficients are presented in Table 3: Correlation coefficients, all images, while the computed t-scores are presented in Table 4: Computed t-scores, all images. Note that M stands for the measured values while S stands for self-reported ones, for both intensity and valence.

Table 3: Correlation coefficients, all images

	Time	*Attention*
Time	1	
Attention	0.204073	1
Intensity M	0.223274	0.492409635
Valence M	0.155213	0.359746372
Intensity S	0.043885	0.275475418
Valence S	0.11273	0.156762363

Table 4: Computed t-scores all images

	Time	*Attention*
Time	1	
Attention	2.376804	1
Intensity M	2.611642	6.4505614
Valence M	1.791406	4.396055
Intensity S	0.500843	3.2673219
Valence S	1.293569	1.8097409

As for a two-tailed t-test, df=130, significance level=0.05, the critical t-value is 1.9784, and for 0.001 is 3.367, exposure time is positively correlated with both intensity and valence, but only the correlation with measured intensity is statistically significant at 0.05. Attention is strongly correlated with measured intensity, self-reported intensity, and measured valence, and significantly correlated with self-reported intensity.

Nevertheless, Image 1 and Image 2, on one side, and Image 3 and Image 4, on the other, differ intrinsically on the valence of the emotions they elicit; thereby, separate analyses were performed for the two groups. Tables 5 and 6 present the correlation coefficients and computed t-values for the intrinsic positive valence Image 1 and Image 2, while Tables 7 and 8 do the same for the intrinsic negative valence Image 3 and Image 4.

Table 5: Correlation coefficients, positive valence images

	Time	*Attention*
Time	1	
Attention	0.275493	1
Intensity M	0.159148	0.515225
Valence M	0.242897	0.711053
Intensity S	0.207544	0.452314
Valence S	0.112417	0.352248

Table 6: Computed t-scores, positive valence images

	Time	*Attention*
Time	1	
Attention	2.292665	1
Intensity M	1.289621	4.809259
Valence M	2.003167	8.090059
Intensity S	1.697306	4.057267
Valence S	0.905072	3.010966

The critical t-values (df=64) are 1.9977 for a significance level of 0.05 and 3.449 for 0.001; there are some changes in the statistical significance of some correlation coefficients for both time and attention as compared with the ones computed from the entire data set (for time, measured intensity and self-reported intensity failed the significance test while the measured valence passed; for attention, the only changes are self-reported valence, which became significant at 0.05, and self-reported intensity, which became significant at 0.001).

Table 7: Correlation coefficients, negative valence images

	Time	*Attention*
Time	1	
Attention	0.140064	1
Intensity M	0.292766	0.474306
Valence M	0.218774	0.416386
Intensity S	-0.10622	0.171868
Valence S	0.286535	0.246991

Table 8: Computed t-scores, negative valence images

	Time	*Attention*
Time	1	
Attention	1.131671	1
Intensity M	2.449455	4.310114
Valence M	1.793645	3.663805
Intensity S	-0.85458	1.395713
Valence S	2.392602	2.0391

There are the same critical t-values as for the positive valence set, as compared to which the following changes occurred: time became negatively correlated (although not statistically significant) with self-reported intensity and significantly positively correlated with self-reported valence, while the positive coefficient with measured valence is no longer statistically significant. For attention, the correlation with self-reported intensity ceased to be significant even at 0.05.

4. Discussion and further developments

Emotions, be they aesthetic or utilitarian, are of a low duration and high intensity (Scherer, 2005). Thereby, as the measured values in this study are the maximum levels recorded during each exposure, duration correlation with measured values of both intensity and valence was somehow biased. The first computed values after image exposure could have been considered, but this might have just given a better measure of the stimuli' intrinsic values, not of how duration and attention modulate these values. From a marketing perspective, the emotions' impact ability is of the highest interest, and, depending on the buying situation, the relevant level may be the first, the highest or the remembered one. The significant correlations of measured and self-assessed valence and intensity (computed t-values in Table 9: Measured and self-assessed values correlations t-values) may bring some light on the rather acceptable magnitude of this issue.

Table 9: Measured and self-assessed values correlations t-values

All data set, N = 132

	Intensity M	*Valence M*	*Intensity S*	*Valence S*
Intensity M	1			
Valence M	3.522517048	1		
Intensity S	6.506328973	7.403797563	1	
Valence S	2.230827577	15.38398689	6.84113886	1

Positive valence images, N = 66

	Intensity M	*Valence M*	*Intensity S*	*Valence S*
Intensity M	1			
Valence M	3.767721267	1		
Intensity S	9.283224949	4.010832729	1	
Valence S	4.419930339	4.083514204	3.48028374	1

Negative valence images, N = 66

	Intensity M	*Valence M*	*Intensity S*	*Valence S*
Intensity M	1			
Valence M	6.507302012	1		
Intensity S	3.317070798	3.41700791	1	
Valence S	3.697651168	5.542946862	2.9900884	1

All correlation coefficients between the measured and self-reported values are statistically significant at 0.001, except for intensity and negative valence images (critical t-value = 3.449, so the significance level is 0.0015).

Two different modulation models seem to stem from this data, for intrinsic positive valence and negative intrinsic valence images, respectively. For positive intrinsic valence images, exposure time positively correlated with both valence and intensity, although statistically significant only with measured valence at 0.05); attention, on the other hand, strongly positively correlated with both valence and intensity, at 0.001 significance except for self-reported valence ($p = 0.0037$). For negative intrinsic images, more exposure time and more attention were always associated with increased valence and intensity, measured and self-reported. Being exposed and paying more attention to attractive stimuli seems to have made the respective stimuli more attractive and the experienced emotions more intense. For intrinsic negative valence images, exposure time significantly positively correlates (at 0.05) with measured intensity and self-reported valence, while the positive correlation with measured valence (computed t-value = 1.7936) does not pass the significance test at 0.05 (critical t-value = 1.9977); the correlation with the self-reported intensity turns to negative, even if not statistically significant at 0.05. For these images, attention is highly positively correlated with the measured levels of both valence and intensity, while the correlation coefficients with the self-reported values, although are still positive, fail to pass the significance tests at 0.05. More exposure time and more attention devoted to rather unpleasant stimuli seems to improve their attractiveness and not increase the intensity of emotions. Overall, the differences between the four seconds and six seconds exposures seem to be sizeable (although the number of observations is too small to allow for reasonable statistical analysis), while much smaller differences are recorded between six to eight seconds exposures. Enlarging the time interval to include exposures of two and ten seconds would bring very valuable insights and so would increasing the number of respondents and recording the measured values at the beginning and the end of exposure.

The imperfect nature of metrics as seen earlier, the rather small number of participants, and different research designs might change the order of correlation coefficients' significance, and even turn them from significant to not-significant at various levels, especially for those close to the border area. Beyond self-reported data, EEG and much more expensive brain imaging techniques are the only ways to assess valence consistently; for intensity, on the other hand, several alternative instruments (including pupillometry, heart rate, respiration rate, and galvanic skin response) are available, reducing the uncertainties related to the source of errors, although some would have not discriminated between increased attention and increased emotion intensity – both would have increased the pupil, for instance.

No significant correlation between self-reported valence and intensity was found by the OASIS creators. Within this study, these correlations are significant for the entire data set, positive, and negative valence images. Although this difference does have little to no impact on the results presented in this paper, some potential explanations should be provided. First, OASIS includes 900 images in several categories, each image rated by about 100 respondents. Finding no significant correlation between valence and intensity for this entire data set does not imply such correlations cannot exist for the four images used in the present study. A second reason would be the contamination effect (Lau, Sears, & Jessor, 1990; Wilcox & Wlezier, 1993; Shentu & Xie, 2010) avoided by OASIS (their evaluators rated either the intensity or the valence) but not by the current experiment, where respondents had to self-report both valence and intensity elicited by each image. As both valence and intensity of an emotion are rather technical terms, and several alternative wordings exist (pleasure and interest, for valence, excitement and arousal for intensity), a confusion might have remained with some of the participants. Nevertheless, significant correlation coefficients were found both between self-reported and measured values. Likewise, although the correlations of duration with measured intensity and valence were partly influenced by the choice of the maximum recorded value during each exposure, similar correlations were found between duration and self-reported values.

Ideally, marketing stimuli would have been used. Still, benchmark values offered by OASIS were highly valued and the intrinsic valence and intensity levels for the images in this study are not outside the range of those associated with products or marketing materials; moreover, it would have been rather difficult to obtain the consent for a negative valence commercial material. Even if some of the brain circuits activated by car racing and car crushing are probably not activated when focusing on a commercial offer in a low-effort setting, one may hypothesize that there is an optimum exposure duration, after which valence and intensity values do not improve anymore. For the used images, it might be said that the optimum exposure time is between six and eight seconds, but if and how this optimum is influenced by the stimuli' starting values need more research. One may speculate that there is such an optimum for attention, too, but current research allows for no hypothesis on its value.

4. Conclusions

Current results support the view that longer exposure duration and more attention allocated to a rather pleasant stimulus make it even more pleasant, and the intensity of the associated emotion increases, but these improvements are smaller and go to zero after a certain time interval (in this case, eight seconds). For a rather unpleasant stimulus, increased duration also helps, as the valence level increases and intensity level flattens out or decreases - an emotional habituation effect mentioned by Dijksterhuis & Smith (2002) for extreme stimuli; increased attention also improves valence, while its correlation with the self-reported intensity is not statistically significant and the one with the (maximum) measured level may be misleading in many situations of interest for consumer behavior.

References

[1] Bisley, J.W., 2011. The neural basis of visual attention. Journal of Physiology, 589(Pt 1), 49-57. DOI: 10.1113/jphysiol.2010.192666.

[2] Byrne, A., Bonfiglio, E., Rigby, C., & Edelstyn, N., 2022. A systematic review of the prediction of consumer preference using EEG measures and machine-learning in neuromarketing research. Brain Informatics, 9(1), 1-23. DOI: 10.1186/s40708-022-00175-3.

[3] Dijksterhuis, A., & Smith, P.K. (2002). Affective habituation: Subliminal exposure to extreme stimuli decreases their extremity. Emotion, 2(3), 203–214. https://doi.org/10.1037/1528-3542.2.3.203

[4] Fiveable, 2024. Top-down and bottom-up attention. Available at https://library.fiveable.me/neuroscience/unit-10/top-down-bottom-up-attention/ study-guide/6YESWixVIYWj7Cvp. [Accessed 12 February 2025].

[5] Frank, S.M., Pawellek, M., Forster, L., Langguth, B., Schecklmann, M., & Greenlee, M.W., 2020. Attention Networks in the Parietooccipital Cortex Modulate Activity of the Human Vestibular Cortex during Attentive Visual Processing. Journal of Neuroscience, 40(5), 1110-1119. DOI: 10.1523/JNEUROSCI.1952-19.2019.

[6] Grandjean, D., Scherer, K.R.,2008. Unpacking the cognitive architecture of emotion processes. Emotion, 8(3), 341–51. DOI: 10.1037/1528-3542.8.3.341.

[7] Hoyer, W.D., MacInnis, D.J., & Pieters, R., 2024. Consumer Behavior. Boston: Cengage.

[8] Johnson, A.R., & Stewart, D.W., 2005. A Reappraisal of the Role of Emotion in Consumer Behavior. Review of Marketing Research, 1, 3-34. DOI: 10.1108/S1548-6435(2004)0000001005.

[9] Scherer, K.R., 2005. What are emotions? And how can they be measured? Social Science Information, 44(4), 695-729. DOI: 10.1177/0539018405058216.

[10] Kurdi, B., & Banaji, M., 2016. Introducing the Open Affective Standardized Image Set (OASIS). Behavior Research Methods, 49, 457-470. DOI: 10.3758/s/13428-016-0715-3.

[11] Lau, R.R., Sears, D.O., & Jessor, T., 1990. Fact or artifact revisited: Survey instrument effects and pocketbook politics. Political Behavior, 12, 217–242. DOI: 10.1007/BF00992334.

[12] Liang, M., Mouraux, A., & Iannetti, G.D., 2013. Bypassing primary sensory cortices – a direct thalamocortical pathway for transmitting salient sensory information. Cerebral Cortex, 23(1), 1-11. DOI: 10.1093/cercor/bhr363.

[13] Mashail, N.A., Malak, B., & Mohammad, A., (2024). Eliciting and modeling emotional requirements: a systematic mapping review. National Center for Biotechnology Information. DOI: 10.7717/peerj-cs/1782.

[14] Mrkva K., Westfall J., & Van Boven L., 2019. Attention Drives Emotion: Voluntary Visual Attention Increases Perceived Emotional Intensity. Psychological Science, 30, 942–954. DOI: 10.1177/0956797619844231.

[15] Pacheco, C., Garcia, I., & Reyes, M., 2018. Requirements elicitation techniques: a systematic literature review based on the maturity of the techniques. IET Software 2018; 12(4), 365-378.

[16] Peskin, M., & Newell, F. N., 2004. Familiarity Breeds Attraction: Effects of Exposure on the Attractiveness of Typical and Distinctive Faces. Perception, 33(2), 147-157. DOI: 10.1068/p5028.

[17] Plassman, H., Ramsøy, T.Z., & Milosavljevic, M., 2012. Branding the brain: A critical review and outlook. Journal of Consumer Psychology, 22(1), 18-36. DOI: 10.1016/j.jcps.2011.11.010.

[18] Rashidi, M., Pazhoohi, F., & Hosseinchari, M., 2012. Effect of facial stimuli exposure time on evaluation of facial attractiveness. Australian Journal of Psychology, 64(3), 164–168. DOI: 10.1111/j.1742-9536.2011.00050.

[19] Résibois, M., Verduyn, P., Delaveau, P., Rotgé, J. Y., Kuppens, P., Van Mechelen, I., & Fossati, P., 2017. The neural basis of emotions varies over time: different regions go with onset- and offset-bound processes underlying emotion intensity. Social Cognitive and Affective Neuroscience, 12(8), 1261–1271. DOI: 10.1093/scan/nsx051.

[20] Richins, M.L., 1997. Measuring Emotions in the Consumption Experience. Journal of Consumer Research, 24 (2), 127–46. DOI: 10.1086/209499.

[21] Russell, J. A., 1980. A circumplex model of affect. Journal of Personality and Social Psychology, 39, 1161-1178. DOI:10.1037/h0077714.

[22] Russell, J. A., & Mehrabian, A. (1974). Distinguishing anger and anxiety in terms of emotional response factors. Journal of Consulting and Clinical Psychology, 42, 79-83. DOI: 10.1037/h0035915.

[23] Schlosberg, H., 1952. The description of facial expressions in terms of two dimensions. Journal of Experimental Psychology, (44), 229-237. DOI: 10.1037/h0055778.

[24] Seamon J.G., Marsh, R.L., & Brody, N., 1984. Critical importance of exposure duration for affective discrimination of stimuli that are not recognized. Journal of Experimental Psychology: Learning, Memory, and Cognition, 10, 465–469. DOI: 10.1037/0278-7393.10.3.465.

[25] Sescousse, G., Rédoute, J., & Dreher, J.-C., 2010. The architecture of reward value coding in the human orbitofrontal cortex. The Journal of Neuroscience, 30(39), 13095–13104. DOI: 10.1523/JNEUROSCI.3501-10.2010.

[26] Shao H., Li, Y., & Ren, G., 2023. Effects of Voluntary Attention on Social and Non-Social Emotion Perception. Behavioral Science, 13(5), 392. DOI: 10.3390/bs13050392.

[27] Shentu Y., & Xie M., 2010. A note on dichotomization of continuous response variable in the presence of contamination and model misspecification. Statistics in Medicine, 29(21), 2200-14. DOI: 10.1002/sim.3966.

[28] Stewart, J. L., & Paulus, M. P., 2013. Neural correlates of craving for psychoactive drugs. Principles of Addiction: Comprehensive Addictive Behaviors and Disorders, 1, 453-466. DOI: 10.1016/B978-0-12-398336-7.000047-4.

[29] Trifu, D., Goga, E., & Bostănică, E., 2024. Neurometrics development for non-neuroscientist social researchers: Neuroscientists will benefit too. In H. Haddade (Ed.) Proceedings of International Conference on Advances in Social Sciences, Education and Humanities 2024, Istanbul, Turkey: ARSTE, pp. 90-97. Available at: https://www.arste.org/storage/ICASSEH/2024/ICASSEH_Proceedings.pdf. [Accessed 11.03.2025].

[30] Verduyn, P., Delaveau, P., Rotge´, J.-Y., Fossati, P., Van Mechelen, I., 2015. Determinants of emotion duration and underlying psychological and neural mechanisms. Emotion Review, 7(4), 330–5. DOI: 10.1177/1754073915590618.

[31] Wadlinger H.A., Isaacowitz D.M., 2008. Looking happy: the experimental manipulation of a positive visual attention bias. Emotion, 8(1), 121-6. DOI: 10.1037/1528-3542.8.1.121.

[32] Wadlinger H.A., Isaacowitz D.M., 2010. Fixing our focus: training attention to regulate emotion. Personality and Social Psychology Review, 15(1), 75-102. DOI: 10.1177/1088868310365565.

[33] Waugh CE, Zarolia P, Mauss, I.B., Lumian, D.S., Ford, B.Q., Davis, T.S., Ciesielski, B.G., Sams, K.V., & McRae, K., 2016. Emotion regulation changes the duration of the BOLD response to emotional stimuli. Social Cognitive and Affective Neuroscience, 11(10), 1550–9. DOI: 10.1093/scan/nsw067.

[34] Weinberg, A., Hajcak, G., 2010. Beyond good and evil: the timecourse of neural activity elicited by specific picture content. Emotion, 10(6), 767–82. DOI: 10.1037/a0020242.

[35] Wilcox, N., & Wlezien, C. (1993). The contamination of responses to survey items: Economic perceptions and political judgments. Political Analysis, 5, 181–213. DOI:10.1093/pan/5.1.181.

[36] Yu X, Li Z, Zang Z, Liu Y., 2023. Real-Time EEG-Based Emotion Recognition. Sensors, 23(18), 7853. DOI: 10.3390/s23187853.

[37] Zajonc, R.B., 1968. Attitudinal Effects of Mere Exposure. Journal of Personality and Social Psychology, 9(2), 1–27. DOI: 10.1037/h0025848 5667435.

[38] de Zilva D., Vu, L., Newell, B.R., & Pearson, J., 2013. Exposure is not enough: suppressing stimuli from awareness can abolish the mere exposure effect. PLoS One, 8(10), 77726. DOI: 10.1371/journal.pone.0077726

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