IMPLICIT VERSUS EXPLICIT MEASURES OF EMOTION PROCESSING IN PEOPLE WITH AGGRESSIVE TENDENCIES AND THOSE WHO USE PORNOGRAPHY

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Declaration

Originality

I hereby certify that to the best of my knowledge and belief this thesis is my own work, conducted under normal supervision and contains no material previously published or written by another person except where due references and acknowledgements are made. The thesis contains no material which has been accepted, or is being examined, for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to the final version of my thesis being made available worldwide when deposited in the University’s Digital Repository, subject to the provisions of the Copyright Act 1968 and any approved embargo.

Thesis by Publication

I hereby certify that this thesis is in the form of a series of four papers. I have included as part of the thesis a written statement from each co-author, endorsed in writing by the Faculty Assistant Dean (Research Training), attesting to my contribution to any jointly authored papers. (*Refer to clause 39.2 of the Rules Governing Research Higher Degrees for acceptable papers).

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List of Publications


**Paper 3:** Kunaharan, S., Halpin, S., Sitharthan, T., & Walla, P. (Unpublished Manuscript) Does EEG and Startle Reflex Modulation vary with self-reported aggression?

**Paper 4:** Kunaharan, S., Halpin, S., Sitharthan, T., & Walla, P. (Unpublished Manuscript) Does varying levels of exposure to pornography and violence have an effect on our non-conscious emotion?

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Additional output

Journal Articles


Conference Abstracts


Abstract

Traditional clinical practice and research in the behavioural sciences has long relied on surveys and questionnaires to gather insight into an individual’s inner state of affect. Although this subjective data was once thought to provide a comprehensive understanding of an individual’s thoughts, feelings and emotions, recent research has shown that many mental processes and behaviours occur without conscious appraisal. The current project aimed to shed light on the literature surrounding findings of differences between non-conscious and conscious emotion-related processes by specifically looking at individuals in the normal population who self-report having varying amounts of aggressive tendencies and those who self-report as viewing varying amounts of pornography. The current project also aimed to determine whether controlled exposure of these groups to violent and pornographic images differently modulated conscious and non-conscious affective processes. To test this, we utilised the simultaneous collection of electroencephalography (EEG), electromyography (EMG) by way of Startle Reflex Modulation (SRM) and self-report data whilst participants were presented with emotion-inducing images acquired via the International Affective Picture System database (IAPS) across three recording sessions. Conscious explicit responses were determined via valence and arousal ratings to each of the images presented. Collectively, the results obtained presented a picture of differently modulated EEG activity predominantly across frontal and parietal electrode sites which varied between high and low aggression and pornography groups at baseline and was independent of conscious explicit responses and SRM. Furthermore, we were able to mimic the ERP physiological effects of high pornography use by the controlled exposure of violent and pornographic images to infrequent pornography users across sessions. Despite the ERP
profiles showing variations across recording sessions, explicit responses remained constant. In sum, the findings of the current thesis provide insight into the confounds of simply relying on conscious subjective methods to understand emotional affect. Taken together the findings of the current thesis provide evidence to suggest clinicians and researchers may need to incorporate objective measures along with previously established subjective criteria to adequately determine a complete understanding of emotional affect in individuals.
Thesis Summary

In layperson’s terms, the following thesis aims to serve several purposes. The introduction of the thesis aims to initially present issues in modern society pertaining to access and viewership of pornographic and violent material. From there, traditional methods of measuring aberrant behaviour with regards to viewing excessive pornography and violence by researchers and clinicians is critiqued. That is to say, questionnaire and face-to-face interviews when determining emotional content is susceptible to cognitive influence. In contrast, the idea that methods utilising physiological measurements may provide additional information on a more non-conscious level which may tell a different story to consciously acquired information is visited. Therefore, the purpose of the thesis at large was to determine whether there are in fact distinct differences between non-conscious implicit and conscious explicit evaluations of experimentally controlled emotional content in a normal population who reports viewing varying amounts of pornographic material and who self-reported as being aggressive.

Due to the new triangulation approach in this field, chapter one, a perspective article, is meant to firstly highlight the issue of increased access and therefore exposure of pornography and violent material to the population at large. Secondly it aimed to investigate whether alternative methods of acquiring emotional information may provide different results to the tried and tested conventional methods incorporating self-report questionnaires and face-to-face interviews. This article makes a case for utilising neuroimaging techniques such as Electroencephalography (EEG) and Startle Reflex Modulation (SRM), which have the ability to determine non-conscious affective reactions to be used in conjunction with and not to the exclusion of already existing methods in
order to make more robust diagnoses of clinical disorders caused or perpetuated by excessive pornography use and aggressive behaviour. It has been published in an open access peer-reviewed science journal.

Chapter 2 follows on from the perspective piece and provides a general introduction and review into the area of study. Previous research is presented in relation to the two groups identified with regards to EEG and SRM studies as well as further critiquing the sole use of traditional self-report methods by researchers and clinicians when attempting to determine emotional affect by highlighting several studies which have found this discrepancy. This chapter closes by highlighting key terms which will be utilised throughout the thesis and providing operational definitions of these terms to guide the reader.

In chapter 3, a paper published in a peer-reviewed science journal with a focus on applied sciences. Baseline data was collected via both traditional methods encompassing conscious deliberate responses (e.g. online survey, conscious evaluation of emotional images) and electrophysiological methods, which are sensitive to non-conscious reactions to affective content (e.g. EEG, SRM) to determine if frequency of pornography use has any relationship with conscious and/or non-conscious emotional states. Participants were divided into three groups (low, medium and high) based on their responses to the frequency they said they viewed pornography (via the online survey) and results were compared. Results obtained showed significant differences in explicit responses for the way groups rated the valence of ‘Pleasant’ and ‘Erotic’ images. No significant findings were found for SRM, although effects showed a trend towards statistical significance. ERP analyses however, showed very clear changes between the groups at later time periods between their responses to ‘Unpleasant’ and ‘Violent’ emotion categories. These
results indicated to us that increased self-reported pornography use appears to influence the brain’s non-conscious responses to emotion-inducing stimuli which was not able to be determined purely by self-reported data.

In chapter 4 baseline data was again used with traditional responses (online survey, conscious evaluation of emotional images) together with electrophysiological methods (EEG, SRM) with the aim to determine if differences in affective states occur in groups with low and high self-reported aggression. Participants in this instance were divided into two groups (low and high aggression/hostility) based on their self-reported hostility as obtained by a modified version of the Buss-Durkee Hostility Inventory (BDHI). Again, as per the previous paper, subjective and objective data was collected and analysed and results were compared. Results indicated that there was no significant differences between the groups for conscious explicit responses and for SRM. ERP analyses however, demonstrated significant group differences between the ‘Pleasant’ and ‘Violent’ emotion conditions in frontal, central and parietal regions across both hemispheres. Although participants in this study were divided based on different criteria to the previous paper (self-reported hostility instead of self-reported pornography), it is again evident that non-conscious affective states can differ as shown by EEG, in particular ERPs, which is not seen when purely relying on conscious self-report measures.

Chapter 5 extends from previous chapters whereby we introduced an exposure component across several recording sessions in order to mimic exposure to violent and pornographic material under experimentally controlled conditions. Participants all completed an additional 2 recording sessions proceeding the baseline session whereby they were exposed to varying amounts of pornographic and violent images at each session. A single round of 50 pornographic and 50 violent images was presented to each
participant at session 2 and a further 9 rounds of the same 100 images were presented at session 3. Once the images were presented, participants rated all 150 IAPS images as they had at baseline. The purpose of this study was to determine if controlled short-term exposure has similar effects (be it priming or desensitization effects) on conscious subjective self-report and objective physiological recordings when compared to varying self-reported actual individual pornography use. In order to avoid any ceiling effects only participants who initially self-reported as being “low” pornography consumers were taken into account and respective data analysed further in this study. Results of ERP analysis confirmed changes in the frontal lobe of the brain between ‘Violent’ and ‘Unpleasant’ emotion conditions. Most crucially, it indeed was found that the ERP profiles of the “low” pornography use group at the conclusion of the 3 sessions appeared to be similar to the “high” pornography use group investigated at baseline in paper 2. What had been inadvertently done was we had been indeed able to artificially mimic the ERP effects of high pornography use in the laboratory by simply exposing “low” users to a combination of pornography and violence. Startle reflex modulation did not show any effects of exposure across sessions and as expected, conscious self-report did not show notable changes between the above two emotion conditions investigated further illustrating the disadvantages of relying on self-report measures in studies of affect.

Finally, chapter 6 concludes by providing a summary of the results obtained in the papers included in this thesis and provides a discussion on the overall results presented. Data obtained from EEG, SRM and self-report measures across all papers are discussed further highlighting the discrepancies obtained between self-report and physiological measures. Implications of said research as well as directions for future investigations in this area are offered, primarily by the suggestion of implementing multiple measures in
emotion research as well as within a clinical setting which are sensitive to the varying levels of emotion processing.

Overall, the contents of the current thesis provides important information regarding the utilisation of various measures to determine emotional affect. It also sheds a light on systematic problem areas currently at play in emotion research and in clinical settings especially when considering issues which may be regarded as taboo in general society. The main objective of this thesis is to state that due to the complex nature of emotion, a multidimensional approach incorporating measures designed to determine implicit and explicit emotion responses is required in future research which may hopefully be integrated into a clinical setting and may aid in diagnostic practices in the future.