The Influence of Presentation Format on Responses of Male Sex Offenders to Digital Paintings that illustrate the Consequences Sexual Crimes

Benta G. Adhiambo Oguda[1,*], George Vikiru[1] & Christine Wasanga[2]

[1]Department of Fine Art & Design, Kenyatta University, Kenya

[2]Department of Psychology, Kenyatta University, Kenya

*Corresponding author: Department of Fine Art & Design, Kenyatta University, Kenya. E-mail: adhiambo.benta@ku.ac.ke

Abstract

Although art viewing experiences occur in varied contexts, responses of audience may be profoundly affected by the presentation format. In this paper, focus is drawn upon participation in a digital paintings exhibition and visual representation in assessing the responses of male sex offenders to digital paintings that illustrate the consequences of sexual crimes. The relationship between arts and technology is an emerging area of interest in modern research. In addition to the traditional gallery displays, digital technologies have provided new ways of audience participation in arts, enabling more involvement in the way art is consumed. The authors sought to determine the effect of viewing screen projected images in Rapid Serial Visual Presentation and in a gallery display. The study applied brief repeated exposures as described in Mere Exposure research. The study utilized temporary exhibition displays and projection by Rapid Serial Visual Presentation (RSVP) where the respondents were passive participants, simply viewing the artwork. The participants were drawn from male sexual offenders aged 18-45 years at Nairobi West Prison, a male offenders' facility in Nairobi City County. Stratified random sampling was used to select 61 male offenders convicted for defilement and rape. Respondents were randomly assigned to two experimental conditions involving viewing in projection by RSVP and gallery display. A five-point Likert scale was used to measure the participants' responses to digital paintings illustrating consequences of sexual crimes. A Multivariate Analysis was used to assess ratings of the digital paintings against the various components of art. Findings show that painting style, colour schemes, themes and exposure frequency significantly influenced the participants' responses to the digital paintings. The study recommends use of comparative analysis to determine how exposure to digital paintings impacts differently on other types of audiences.

Keywords: Rapid Serial Visual Presentation, gallery, display, projection, digital paintings

1. Introduction

The way viewers engage with art has seen a dramatic shift owing to the growth and availability of information technologies. While the format of presentation might contribute to disparities in art experience, the topic remains underexplored. With the advent of digital recording equipment, artists are exploring digital technology as a new way of presenting art alongside the traditional gallery displays. Studies have established that aesthetic experience is affected by the context in which it occurs and the prison setting is one such context (Pelowski, Forter, Tinio, Scholl & Leder, 2017). While the dawn of the 21st century has seen rising interest in the effects of artistic engagements in prison systems Brewster (2014) and Gussack (2009), the responses of the prisoner audience to visual arts based on formats of presentation remains largely underexplored. Regardless of the undisputed value of the art-based programs already in place in prisons, it is worth exploring other formats of presenting art that do not necessarily involve offenders' participation by active creation. While CohenMiller (2018) argued that recognizable symbols used in visual presentation turn out to be dependable recollections with the ability to change attitudes if viewers effectively consider the substance of the picture, the use of visual arts in prison setting in Kenya has been minimal. This research takes a different approach in investigating responses arising from presenting screen projected and gallery displayed canvas prints of digital paintings illustrating the consequences of sexual crimes.

2. Literature Review

In supplementing the traditional techniques of displaying artwork, digital technologies in artistic applications has seen a change in the way audience experience artwork. Kukka et. al (2017) report a significant paradigm shift of art as a physical object in the 20th century. Millions of audiences engage with the arts sector through gallery exhibitions and digital media, with technology revolutionizing the way art is presented to the audience. Research suggests the existence of common fundamental mechanisms at work during the process of experiencing art and that a creative, exploratory attitude can be heightened by objective factors such as the kind of stimulus presented, the type of additional information provided, and the wider exhibition context (Jozwiak, 2013). In an attempt to contribute to knowledge, this study conforms to nominal participation through viewing digital paintings in a gallery display and by projection in RSVP.

2.1 Gallery Display as a Format of Exposure to Art

Exhibitions have become a medium through which most art becomes known and according to Cline, (2012) represent ideal forums for dialogue. Wahab and Zuhardi (2013) define exhibitions as complex presentations that convey concepts, showcase objects, and excite the senses. Smeds (2012) on the other hand defines an exhibition as a spatially organized and visualized expression of thoughts, things and systems of knowledge, and to a large extent based on the display of material objects. Exhibitions today serve the goal of bringing art to a place of relevance that is relatable to a wide audience, by using varied strategies to connect

and to touch audiences (Cline, 2012). Exhibits offer potential for emotional connection by giving viewers an opportunity to experience objects in their actual scale and multiple perspectives in real space.

According to Wahab and Zuhardi (2013), the primary function of a gallery is to communicate. Carbon (2017) noted that the mean time taken to view art in a temporary exhibition consisting of 28 paintings was 25.7s to 41s per picture with viewers spending more time when attending in groups. Smith, Smith and Tinio (2016) counted the time people spend looking at different artworks at Art Institute of Chicago and found the mean amount of contemplation time was 28 seconds. Carbon's observation provides one essential success factor of temporary exhibitions that shows a restricted number of artworks, enabling viewers to elaborate on a topic by focusing on it. The current study adopted this view by limiting the number of digital paintings used to 24 and allowing respondents to view in groups of 5-7 people. This follows the argument that with controlled number of artworks, the audience could achieve aesthetic understanding (Muth & Carbon, 2013) and sustainable memories through deeper processing of artwork (Belke et al., 2015).

According to Wahab and Zurhabi, (2013) displays in the exhibition area must catch the eye of a user and hold the interest as users get the message across fast. Winfield and Webber (2011) opined that the objective of the exhibition was to allow face-to-face contact between artist by bringing together the purveyor of a message and the visitors. According to Pelowski et al (2016), art viewing engenders myriad emotions, evokes evaluations, physiological reactions, and in some cases can mark or alter lives. Leder (2013) observes that understanding this multifaceted impact of art is especially key for psychology and empirical art research in addition to numerous areas of scholarship such as sociology, humanities, art history and museum education among others.

Cline (2012) argues for the pivotal role of exhibitions and their challenge to viewers' preconceptions by contributing to artistic dialogue of their time. The method of display plays a huge role in the impact of an exhibition, its reception and its message (Cline, 2012). In this study, exhibits had the advantage of being perceived with multiple senses such as sight, touch and even smell. A key advantage of exhibition was that it allowed viewers to experience objects directly and unmediated by technology. This study views the exhibition as a template providing an ideal platform for a new idea where a challenge is presented to participants in order to draw attention and emotional responses to the digital paintings. The study further postulates that a creative, exploratory attitude may be heightened by objective factors such as the kind of stimulus presented, the amount and type of additional information provided, and the wider exhibition context.

Although the present study was not carried out in a museum set up, the exhibited digital paintings relatively compare to the artwork in a museum and were viewed repeatedly for short periods of time (averaging at 2 minutes per painting) The time provided for each viewing session was considered sufficient for initial processing of the art work. This was done in keeping with the requirements of Mere Exposure which demand that stimulus is shown to participants repeatedly for brief durations to avoid over exposure which results in

boredom and depreciation of stimulus.

2.2 Rapid Serial Visual Presentation as a Format of Presenting Art

Rapid Serial Visual Presentation (RSVP) is the process of displaying images in a sequence at high presentation rates with multiple images per second at the same spatial location (Lees et.al., 2017), using either the static mode in which images appear and disappear without moving or moving mode where targets within short moving clips have to be identified (Cecotti, Eckstein & Giesbrecht, 2012; Weiden, Khosla & Keegan, 2012). Rapid Serial Visual Presentation (RSVP) has been shown to provide flexibility of control and varied image presentation modes (Witkowski & Spence, 2012). The key factor of RSVP paradigm is presentation rate, where information is presented at rapid rate with more data being analyzed in a short period. Researchers list variants of RSVP such as key hole mode, shelf-mode, carousel-mode, collage-mode and floating-mode.

Recognition of target image has been shown to occur with 90% success rate in slide show mode even in high presentation rate (Spence & Witwoski, 2013). Studies comparing static and moving modes of RSVP found higher identification and better memory for static images in slideshow (key hole) mode (Porta & Ricotti, 2017; Abdullah & Ali, 2011). According to Spence & Witwoski (2013), task recognition accuracy averages at 84% across all static modes (slideshow mixed and tile mode) and 62% across all moving modes (diagonal, ring and stream modes). Spence and Witwoski (2013) also found 75% preference for static modes where target recognition accuracy was less influenced by the nature of the task. Two hypotheses put forward by Spence (2002) to explain the performance of keyhole-mode suggested that due to the static nature of the image presentation, RSVP would minimize eyestrain in users and secondly, the user's eye-gaze can only usefully be fixated in one location. Nico, Potter and Nieuwenstein (2017) linked good long-term memory and success of image identification with increased presentation time. Candan, Cutting and DeLong (2016) also found increased memory performance with longer exposure durations ranging from 400ms- 2000ms per image and superior overall memory performance for dynamic images.

Mallon et al (2014) similarly found positive effects while presenting images in varied durations of up to 3000ms. While using five-minute video clips, Ferguson (2014) attributed memory boost for dynamic images to longer exposure and richer information. Increased performance with kinetic images during the RSVP paradigm was also reported by Weiden, Khosla and Keegan (2012), while a study by Lees et al (2018) where participants were to identify images containing natural scenes, reported reduced performance for faster stimulus presentation.

The studies provide contradicting evidence on the superiority of static and dynamic images in RSVP. Differences also arise in what is considered sufficient time for stimulus recognition. However, Potter (2012) adds that blank inter-stimulus intervals added after every picture increased percentage of picture remembrance by up to 84%, pointing to methodological differences that create disparities in time sufficient for stimulus recognition. Although there may be need to balance the tradeoff between accuracy and speed, variations in stimulus recognition time suggest that this may vary for different stimuli and tasks required of the

participants.

Despite the different observations, this study adopted shelf mode of RSVP, where images would zoom in and fade out centrally located on the screen. This is pegged on the observation by Dias and Parra (2011) that participants performed best (90%) when the target stimulus was centered, but register a consistent decrease of performance to 50% in all participants when target stimulus was placed further away from the center (4º of visual angle. A strong factor in slide show mode is that success in recognition rate is less dependent on nature of the task.

3. Methodology

Nairobi West Prison, a male offenders' facility in Nairobi City was purposively selected as the study site. According to Cooper and Schindler (2014), a sample is a segment of the population selected to represent the population as a whole. In this study, sampling was done to select the art experts, themes for digital paintings and the study participants. Three art experts validated the 24 digital paintings and the art response questionnaire used in the study. The sample of respondents was drawn from sex offenders aged 18-45 years. Random sampling was used to assign respondents to one of the two viewing conditions namely viewing paintings in a Gallery display and by screen projection. The study applied participatory action involving viewing of digital paintings which illustrate the consequences of sexual crimes.

Primary data was collected by use of questionnaires and focus group discussions for triangulation to enhance the reliability, and quality of the collected data (Heale & Forbes, 2013). The format of presentation of the artwork was between-subjects variable where respondents were exposed to the digital paintings either through gallery exhibition or by projection in Rapid Serial Visual Presentation (RSVP). There were fifteen presentations spread over 5 weeks in three-day intervals. The viewing sessions were brief, lasting 35minutes for exhibition group and 20 minutes for RSVP group to avoid over exposure.

Digital paintings with brief titles were displayed approximately two linear feet per painting on two walls of the exhibition hall. Viewing time averaged at 1.9 minutes per painting and viewing distance varied for each painting, but was averagely kept at 105 cm given that all paintings had uniform dimension of H=117.8 cm and W=83.7 cm with varied formats as shown in Figure 1.
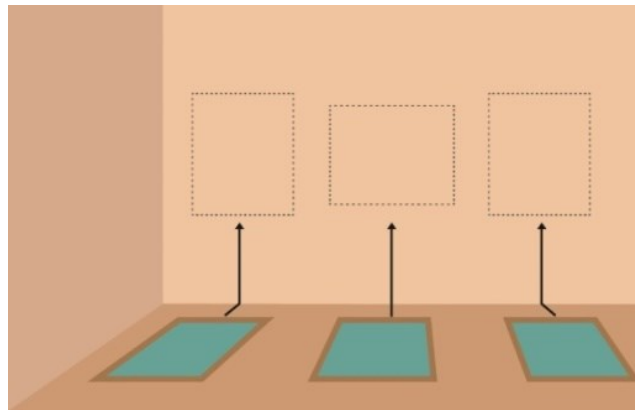
Figure 1. Layout for Gallery Display of Digital Paintings

In the RSVP exposure phase, digitized copies of 18 paintings were projected at their actual size via a beam projector (Casio Data Projector-XJ-A150V) on a white background wall in an exhibition hall at the Nairobi West prison. The study adopted shelf mode RSVP where recognition of target image has been shown to occur with 90% success even in high presentation rate (Spence & Witwoski, 2013). Since the study was focused on cognitive effects of viewing digital paintings, each single image was presented for 3000ms and updated at a regular time interval at the same location, followed by a blank backward masking of 800ms, which has been found to increase percentage of picture remembrance by up to 84% (Potter, 2012). Each exposure session had 7 sequences with 3-minute breaks after every 2 sequences. The presentation sessions lasted between 20 minutes including preparation time with different target stimuli per session. Participants had a total of 15 viewing sessions in three-day intervals for 5 weeks. At the start of the experiment, the participants were given detailed instruction about what to expect and how to respond by putting a dotted mark on green circles in the target Stimuli recognition template when target stimuli were detected and dotted mark on red circles when target stimuli were not detected in the sequence.

In each session, participants searched for six targets in an RSVP sequence of eighteen digital paintings presented at the center of the screen with a resolution of 1024×768 pixels on the white background with a horizontal visual angle of 15.9° and a viewing distance fixed at 3 metres. The category name of the targets were first presented in black 48-point times new roman font and displayed for 2000 ms. The fixation cross reappeared for 500 ms, followed by a blank interval of 800 ms and then the digital painting sequence. The schematic representation of RSVP exposure is presented in Figure2.
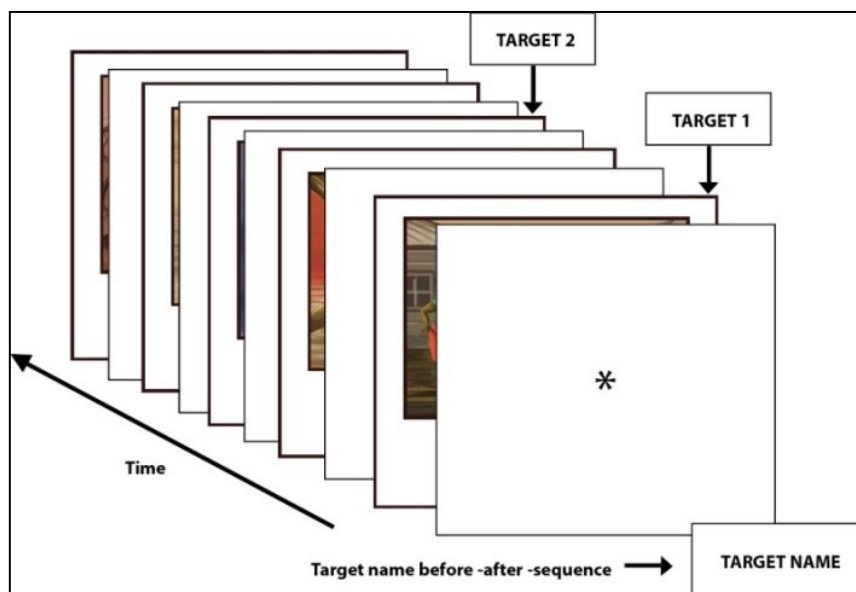
Figure 2. Schematic Representation of Rapid Serial Visual Presentation Sequence

An art response questionnaire was administered to investigate the responses to digital paintings following repeated exposures. The study results are as presented in the following section.

4. Results

The aim of the study was to assess influence of presentation format on responses of male sexual offenders to digital paintings that illustrate the consequences of sexual crimes. In seeking to establish whether the formats of Exposure influenced the participants' responses to the digital paintings, the study controlled for the participation by randomly selecting a section of the respondents to be exposed by viewing in a gallery display and by projection in Rapid Serial Visual Presentation. Out of the 61 initial respondents, 57 were retained with 29 being exposed to digital paintings in gallery display while 28 were exposed via projection in RSVP. The study findings showed that majority of the participants (91.07%) had no training or art experience prior to participation in the study, while only 8.93% had some prior experience in art.

The paintings were classified by colour, style and themes to assess if the format of exposure could result in any significant differences in preference ratings. Ratings were done based on the age of the participants

4.1 Ratings for Colour by Age of Participants and Context of Participation

The study rated the preference for colour schemes of the digital paintings based on age of the participants. Figure 3 shows mean score ratings of colour schemes by to age.
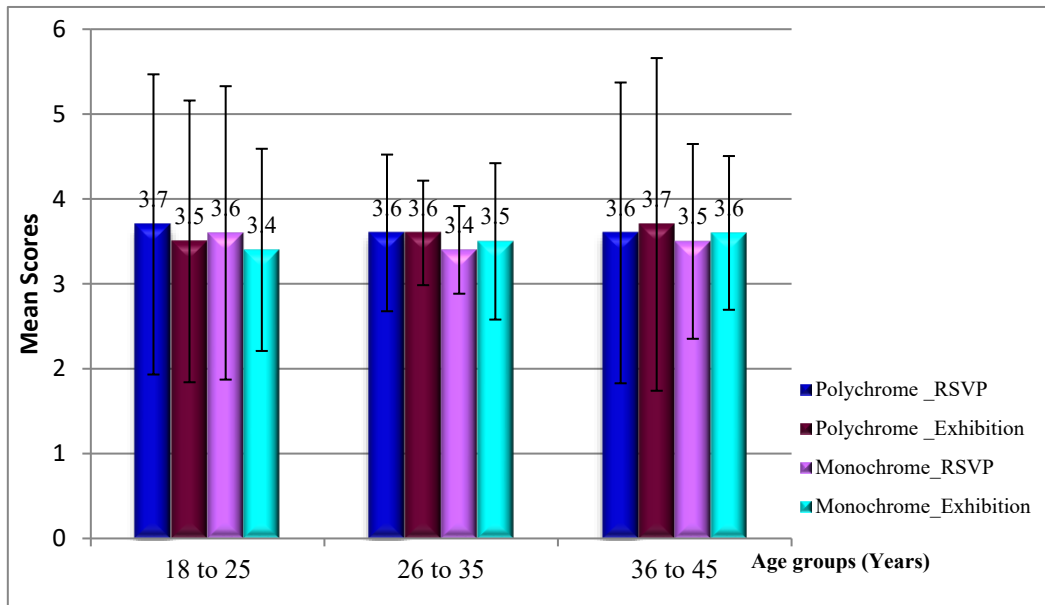
Figure 3. Mean Score Ratings of Colour by Age and Context of Participation

Findings show that polychrome paintings had a higher mean score in RSVP presentation by the participants aged 18-25years, but had slightly lower ratings among in participants aged between 26-35 years and 36-45 years respectively. In the exhibition, polychrome paintings had the highest ratings among the older participants aged between 36-45 years and the lowest ratings by younger participants aged 18-25 years.

In RSVP presentation, monochrome paintings similarly had slightly higher ratings among younger participants aged 18-25 years, while participants aged 26-35 years reported the lowest mean scores. Under exhibition, the higher ratings for monochrome paintings were reported among older participants aged 36-45 years, with the younger participants aged 18-25 years reporting the lowest score.

4.2 Ratings for Style by Age of Participants and Context of Participation

Ratings were done for preference of style of the digital paintings as summarized in Figure 4.
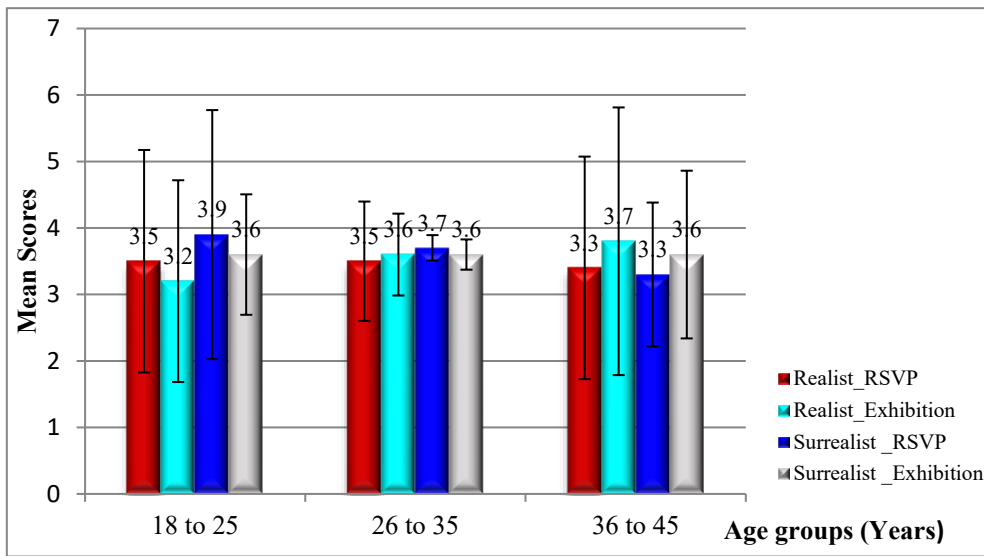
Figure 4. Mean Score Ratings of Painting Styles by Age of Participant

Findings show that participants aged 18-25 years and 26-35 years in RSVP preferred realist paintings better, while participants aged 36-45 years reported a slightly lower preference. In the exhibition format, higher scores for realist paintings were reported among older participants aged 36-45 years, with participants aged 18-25 years reporting the lowest scores. For surrealist style, the highest score was reported among participants aged 18-25 years under RSVP and lowest scores among participants aged 36-45 years. There was a tie in scores for all groups of participants for surrealist style under exhibition format.

4.3 Ratings for Themes by Age of Participants and Context of Participation

Further ratings were done for preference of themes according to age of participants. Figure 5 shows the mean score ratings of painting themes based on age of participants.
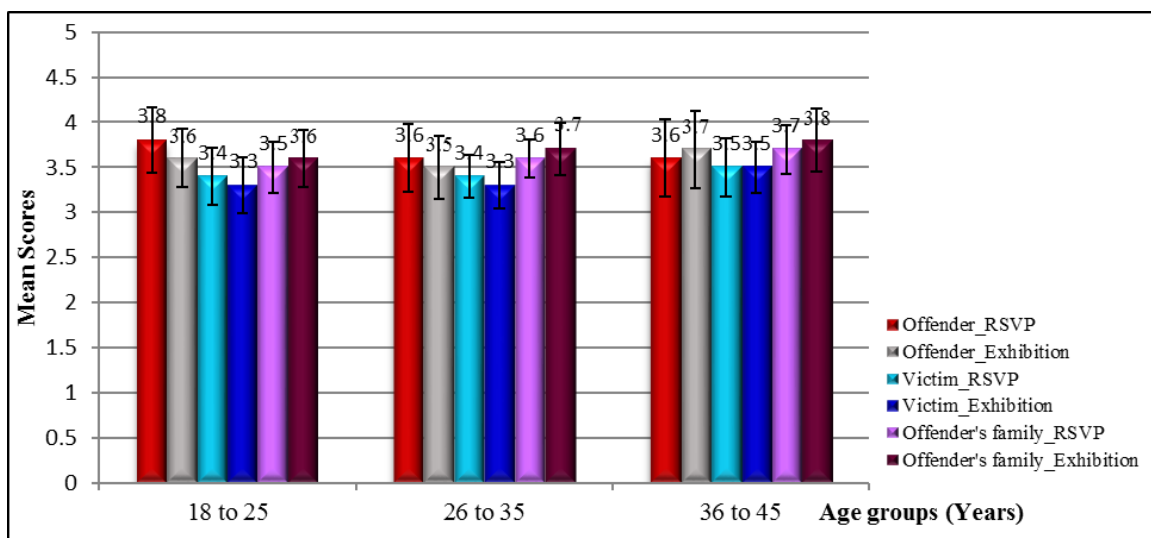

Figure 5. Mean Score Ratings of Painting Themes by Age of Participants and Context of Participation

Findings show that offender-based themes were rated highest under RSVP by participants aged 18-25 years, while participants aged 36-45 rears rated offender-based themes highest under exhibition format. Victim based themes were also highly rated under RSVP and exhibition by older participants aged 36-45 years, while participants aged 18-25 years and 26-35 years reported low scores under both formats of exposure. Data further showed that across both presentation formats, offender's family-based themes scored slightly higher among older participants aged 36-45 years as compared to the younger participants. Although the general observation is that the differences in preference across all ratings had minimal variations; the trends provide an interesting subject for future studies.

Fifteen indicators were further used to test the usefulness of knowledge shared through the digital paintings. The study also tested whether the paintings improved the participants' understanding of the consequences of sexual crimes and the ease with which they interpreted the paintings. Cross-tabulations were performed to assess the association between presentation formats and the responses to each question. Since each indicator was measured on a categorical ordinal scale with the scores of 1 to 5 depending on the level of the respondents' levels of agreement with the statements, contingency tables (cross-tabulations) were best suited to assess the associations. The contingency tables between each response and mode of presentation displays the frequency (number of respondents) that were exposed via gallery display for responses on either strongly agreed or strongly disagreed and via projection in RSVP for responses ranging in the same category.

This is presented in Table 2 with the chi-square test of association which is used to assess the significant difference in the frequencies between groups based on contingency tables. The Chi-square tests for all the associations between nominal participation presentation modes and the indicators of the responses to digital painting messages had p-values greater than 0.05. This implies that format of exposure had no significant association with the responses to the digital paintings.

Table 1. Chi-square Test of Association between Format of Exposure and Indicators of Response to Digital Paintings

	Chi-square	df	Sig.
Exposure mode vs Indicator1	3.414	3	0.332
Exposure mode vs Indicator 2	0.325	2	0.850
Exposure mode vs Indicator 3	1.142	2	0.565
Exposure mode vs Indicator 4	4.214	3	0.239
Exposure mode vs Indicator 5	1.095	2	0.578
Exposure mode vs Indicator 6	0.983	3	0.805
Exposure mode vs Indicator 7	0.234	2	0.890
Exposure mode vs Indicator 8	3.908	3	0.272
Exposure mode vs Indicator 9	1.455	2	0.483
Exposure mode vs Indicator 10	1.533	2	0.465
Exposure mode vs Indicator 11	2.660	3	0.447
Exposure mode vs Indicator 12	3.709	2	0.157
Exposure mode vs Indicator 13	1.059	2	0.589
Exposure mode vs Indicator 14	3.304	3	0.347
Exposure mode vs Indicator 15	1.559	2	0.459

Factor analysis was used to reduce the dimensions of the scores for the responses to each of the messages. The composite measure of response scores to digital painting was determined as standardized factor scores from the factor analysis results. The variable was further analyzed as shown in Table 2.

Table 2. Mean Response Score to Digital Paintings

	Presentation	N	Mean score	Std. Deviation	Std. Error Mean
Response to digital paintings	Overall	57	0.899	0.441	0.058
	RSVP	28	0.871	0.506	0.094
	Exhibition	29	0.929	0.370	0.070

The mean overall mean score of the standardized response score to digital painting was found to be 0.899. Considering mean response score for each of the 2 categories, the mean response score was observed to seemingly differ between the 2 categories to imply that mode of exposure could have had a possible effect on the response to digital paintings. A seemingly higher mean score response of 0.929 was found for the respondents who were exposed via exhibition compared to a mean score of 0.871 for respondents exposed via RSVP.

To assess the significant effect of format of exposure on response to digital paintings, a test on the significance of the mean difference in mean response score in the two groups was carried out. An independent mean difference t-test was conducted between the two groups and the results presented in Table 3.

Table 3. Effect of Exposure Format on Responses to Digital Paintings

	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval Lower	Upper
Equal variances	6.764	0.012	-0.309	47	0.759	-0.089	0.289	-0.670	0.491
Non -Equal variances			-0.311	43.9	0.757	-0.089	0.287	-0.667	0.489

The t-test carried out is based on an assumption that either the variances of the response variable exhibit homogeneity or heterogeneity between the two groups. An F-test of equal variances was thus carried out to assess the homogeneity of variance. The F-statistic of has a p-value less than 0.05 to imply that the variances are not equal thus the t-test was based on the assumption that the variances are not equal (heterogeneous). The p-value of the t-statistics assuming heterogeneous variances was found to be -0311 with a p-value of 0.757 which is greater than 0.05 to imply no significant difference in mean response between the two groups in either format of exposure

The results were used to test the hypothesis of the study and draw conclusions. The hypothesis stated:

H_{01} *The format of exposure to digital paintings has no significant effect on the response of male sexual offenders to the digital paintings*

On the analysis carried out to assess the significant difference in the sexual offenders' responses to digital paintings, p-value of the t-statistic was found to be greater than 0.05. The study thus failed to reject the null hypothesis and deduced that there is no significant difference in the mean response score to digital paintings based the format of exposure. This implied that the format of exposure chosen for viewing has no significant effect on the responses that the sexual offender would have towards the digital paintings

5. Discussion of Findings

The main aim of the study was to assess the effect of exposure format on responses of male sexual offenders to digital paintings that illustrate the consequences of sexual crimes. The audiences for this study were male sexual offenders drawn from Nairobi West prison, a male offenders' facility in Nairobi City County. The time provided for each viewing session lasting 20 minutes for RSVP and 35 minutes for exhibition was considered sufficient for processing of the digital paintings. The presentations provided an opportunity for interaction between the artist (Researcher) and the audiences (male sexual offenders). This is in line with Whitfield and Webber's (2011) observation that the objective exhibiting art is to bring together the purveyor of a message and the visitors and to allow face-to-face contact between artist and the target audience.

Art is always experienced in a specific context. In this study, the participants were exposed to digital paintings under two contexts; namely Exhibition Viewing and projection in Rapid Serial Viewing Presentation (RSVP) respectively. Paintings presented by RSVP comprised of the digitized copies, while the gallery display comprised of canvas prints of the digital paintings. The gallery displays offered the advantage of digital paintings being perceived with multiple senses such as sight and touch and a direct experience unmediated by technology (Cline, 2012). Rapid Serial Visual Presentation (RSVP) on the other hand has been shown to provide flexibility of control and varied image presentation modes (Witkowski & Spence, 2012).

The model of aesthetic appreciation and aesthetic judgments (Leder et al., 2004) offered a more holistic understanding of the participants' responses when viewing digital paintings. The participants went through the processes of the viewing as proposed by (Leder et al., 2004). This study found that exploring a stimulus following repeated exposure rendered positive reinforcement as suggested in a series of experiments by Stang (1974). In conforming to the mere exposure conditions, viewing sessions were kept brief lasting 20 minutes and 35 minutes respectively for RSVP, exhibition, and groups respectively. This was found to result in stronger exposure effects as suggested by Bornstein's (1989) meta-analysis of research that showed strongest effects with brief exposures. Although some studies have

shown weaker mere exposure effects for paintings, this study found stronger effects and increased preference following the delay periods between the first viewing and the subsequent viewings, as suggested by Stang (1974) and Bornstein (1989). The delay periods introduced between the presentations of digital paintings were also found to raise participants' anticipation for future sessions.

Like in the study by Brieber et. al (2014) the gallery displayed digital paintings and those presented by projection in RSVP in the current study relatively compare to the original artwork and computer simulated versions. They also respectively relate to laboratory context where reproductions of artworks are viewed on computer screen and the museum context where originals are viewed. This study in directly comparing ratings on a variety of measures for digital paintings seen in exhibition and digital images of the same work by screen projection in RSVP found that the format of exposure formats did not affect the participants' responses to the paintings. The findings of this study correspond to Locher, Smith and Smith (2001) whose study found similar evaluations on pictorial content or composition of paintings across presentation formats while comparing slide-projected images of paintings and the originals.

An independent mean difference t-test carried between participants in RSVP and exhibition format resulted in a p-value greater than 0.05 implying no significant difference in mean response between the two groups. However, mean scores showed a slight raise for exhibition participants at 0.9289 against 0.871 for RSVP. Although minimal, the findings resonate with Brieber et.al (2014) who found more positive evaluation of original paintings and sculptures as compared to computer-simulated versions. Similar observation were also made by Bertamini and Blakemore (2019) who found an overall preference for viewing a reproduction of an original painting as opposed a digital image. Despite the minimal difference between the Exhibition and RSVP, the study findings point to a possibility of an increase in exhibition scores with unrestricted viewing time and an ideal environment as has been the practice in other art viewing studies. It is apt to note that in this study, the conditions of viewing, the type of participants and the circumstances surrounding them did not exactly match those in previous studies linked to art viewing where participants were well-informed free citizens. The unique observations of this study therefore could be linked to the disparities in the context of viewing and the type of participants. The exhibition hall used in Nairobi West prison could not exactly compare to the well-established museums where previous studies have been carried out. Similarly, unlike the current study where viewing time was restricted to conform to mere exposure requirements, previous studies did not limit viewing time.

Although results showed that younger participants (aged 18-25 years) had slightly higher mean scored on preference for polychrome schemes, realist and surrealist styles and offender-based themes, the differences were very minimal, but could be of interest for future research with a different audience. Findings of this study showed no significant statistical difference arising from format of exposure. The results present two possible implications: That exhibition having been traditionally used to present artwork to the audience to still remains a reliable method enabling the audience to experience artwork. The study also affirms invaluable place of technology in presentation of artworks by suggesting RSVP as an

alternative format of exposure that could be as effective as exhibition. Since the format of exposure chosen has no effect on responses to art, any method can be utilized effectively.

Like in the study by Smith and Smith (2001), the participants in the exhibition viewing gathered in social groups of 5-7 to view the paintings thereby spending longer time on each painting. Art interventions in a group setting has been found to be effective as a trigger for verbal channels of communication which is cognitive and the visual channel which is emotional (Shenaar-Golan & Walter, 2018). The current study benefited from group viewing to arouse curiosity about the digital paintings and deepen understanding through discussions. In contrast to participants in RSVP just like in a laboratory set up had the viewing distance fixed. The speed of presentation and rating provided no room for discussion, subjecting them to individual testing.

6. Conclusion and Recommendations

This paper assessed how format of exposure affected the responses of male sexual offenders to digital paintings. Furthermore, the issue of whether exhibition or RSVP formats are linked to preference for an artwork was examined. The findings offered an empirical footnote for discussions on the assumptions regarding the effect of repeated exposure on participants' responses to visual arts. Results showed varied responses across different measures. One possibility was that responses to digital paintings could be enhanced by projection in Rapid Serial Visual presentation or gallery display format of exposure. The brief exposure sessions lasting 35 minutes for the exhibition participants and 20 minutes for the participants in RSVP and a period of delay between the presentations were found to result in stronger exposure effects. The study however found no significant difference in the mean responses between the participants in the exhibition and RSVP. The findings suggest that the format of exposure used had no significant effects on the male sexual offenders' responses to digital paintings.

Although the study findings showed that most participants (91.07%) had no experience of art before participating in this study, their responses provide an insight to scholars seeking to use visual art in rehabilitating offenders. The study found positive responses following exposure to digital paintings by most of the respondents. These results presented two possible conclusions: The first on is that the exhibition having been traditionally used in museum and gallery presentations remains a reliable method enabling the audience to experience artwork. Secondly, the study also affirmed the invaluable place of technology in the presentation of artworks by suggesting RSVP as an alternative format of exposure that could achieve outcomes similar to exhibition exposures.

The findings of this study could inform future research studies intending to investigate differences between traditional gallery display and new methods of presenting art work to the audiences. The findings of this study also present art viewing as a new approach for scholars intending to use art-based interventions with offenders. It also provides an additional and affordable passive method of participation in the arts to prisons that are not able to afford the active participatory approach where offenders learn and express themselves through art

production. The study findings further provide more insights on the possibilities audience's responses to visual arts in new contexts away from the traditional museum viewing. Future studies could manipulate specific contextual features to explore other modes of presentation and themes not covered in this study.

References

Abdullah, S. Z., & Ali, N. M. (2011). *Using Moving and Static RSVP Presentation Modes on Children's Digital Flashcard*. 2011 International Conference on User Science and Engineering (i-USEr), Selangor, Malaysia, 2011, pp. 95-99. https://doi.org/10.1109/iUSEr.2011.6150544

Belke, B., Leder, H., & Carbon, C. C. (2015). When Challenging Art Gets Liked: Evidences for a Dual Preference Formation Process for Fluent and Non-Fluent Portraits. *PLoS One, 10*, e0131796.

Bertamini , M., & Blakemore, C. (2019). Seeing a Work of Art Indirectly: When a Reproduction is Better than an Indirect View, and a Mirror Better than a Live Monitor. *Front. in Psychol*. https://doi.org/10.3389/fpsyg.2019.02033

Bornstein, R. F. (1989). Exposure and Affect: Overview and Meta-Analysis of Research, 1968–1987. *Psychological Bulletin*, *106*(2), 265-289.

Brewster, L. (2014). The Impact of Prison Arts Programs on Inmate Attitudes and Behavior: A Quantitative Evaluation. *Justice Policy Journal, 11*(2), 1-28.

Brieber, D., Nadal, M., Leder, H., & Rosenberg, R. (2014). Art in Time and Space: Context Modulates the Relation Between Art Experience and Viewing Time. *PLoS One, 9*, e99019.

Candan, A., Cutting. J. E., & DeLong, J. E. (2015). RSVP at the movies: Dynamic images are remembered better than static images when resources are limited. *Visual Cognition, 23*(9-10), 1205-1216.

Carbon, C. (2107). Art Perception in the Museum: How We Spend Time and Space in Art Exhibitions. *I-Perception, January-February 2017*, 1-15. https://doi.org/10.1177/2041669517694184

Cecotti, H., Eckstein, M. P., & Giesbrecht, B. (2012). Effects of Performing two Visual Tasks on Single-Trial Detection of Event-Related Potentials. *Conference Proceedings: Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 1723-1726.

Cline, A. C. (2012). The Evolving Role of the Exhibition and its Impact on Art and Culture. *Trinity College Digital Repository*. Retrieved from http://digitalrepository.trincoll.edu/theses/267

CohenMiller, A. S. (2018). Visual Arts as a Tool for Phenomenology. *Forum: Qualitative*

Social Research, 19(1), Art. 15. http://dx.doi.org/10.17169/fqs-19.1.2912

Cooper, D., & Schindler, S. (2014). *Business Research Methods*. New York: McGraw-Hill Irwin.

Dias, J. C., & Parra, L. C. (2011). No EEG evidence for subconscious detection during Rapid Serial 31 Visual Presentation. *2011 IEEE Signal Processing in Medicine and Biology Symposium (SPMB), 32 IEEE*, 1-4. Https://doi.org/10.1109/SPMB.2011.6120108

Ferguson, R. (2014). *Visual Recognition for Dynamic Scenes* (Ph.D. Dissertation). Arizona State University. Retrieved 26-07-2019 from http://repository.asu.edu/attachments/135015/content/Ferguson_asu_0010E_13954.pdf

Gussak, D. (2009). Comparing the Effectiveness of Art Therapy in Depression and Locus of Control of Male and Female Inmates. *The Arts in Psychotherapy, 36*, 202-207.

Heale, R., & Forbes, D. (2013). Understanding Triangulation in Research. *Evid Based Nurs, 16*(4). https://doi.org/10.1136/eb-2013-101494

Jozwiak, J. (2013). *Meaning and Meaning-Making: An exploration into the importance of creative viewer response for art practice*. Unpublished Ph.D thesis. Goldsmiths College, University of London. Retrieved from https://research.gold.ac.uk/10548/1/ART_thesis_JozwiakJ_2014.pdf

Kukka, H., Ylipulli, J., Goncalves, J., & Ojala, T. (2017) Creator-Centric Study of Digital Art Exhibitions on Interactive Public Displays. *16th International Conference on Mobile and Ubiquitous Multimedia*. https://doi.org/10.1145/3152832.3152835

Leder, H. (2013). Next Steps in Neuroaesthetics: Which Processes and Processing Stages to Study? *Psychol. Aesthet. Creat. Arts*, 7, 27-37.

Leder, H., Belke, B., Oeberst, A., & Augustin, D. (2004). A Model of Aesthetic Appreciation and Aesthetic Judgments. *Br. J. Psychol., 95*, 489-508.

Lees, S., Dayan, N., Cecotti, H., McCullagh, P., Maguire, L., Lotte, F., & Coyle, D. (2018). A Review of Rapid Serial Visual Presentation-Based Brain-Computer Interfaces. *Journal of Neural Engineering, 15(*2), 021001. https://doi.org/10.1088/1741-2552/aa9817

Locher,P., Smith, J.K., & Smith, L.F. (2001). The Influence of Presentation Format and Viewer Training in the Visual Arts on the Perception of Pictorial and Aesthetic Qualities of Paintings. *Perception, 30*(4), 449-65. https://doi.org/10.1068/p3008

Mallon, B., Redies, C., & Hayn-Leichsenring, G. U. (2014). Beauty in abstract paintings: perceptual contrast and statistical properties. *Front. Hum. Neurosci., 8*, 161.

Muth, C., & Carbon, C. C. (2013). The Aesthetic Aha: On the Pleasure of Having Insights into Gestalt. *Acta Psychologica, 144*, 25-30.

Nico, B., Potter, M. C., & Nieuwenstein, M. (2017). Enhanced recognition of memorable pictures in ultra-fast RSVP. *Psychonomic Bulletin & Review, 25*(3), 1080-1086.

https://doi.org/10.3758/s13423-017-1295-7

Pelowski, M., Forster, M., Tinio, P. P. L., Scholl, M., & Leder, H. (2017). Beyond the lab: An examination of key factors influencing interaction with 'real' and museum-based art. *Psychology of Aesthetics, Creativity, and the Arts, 11*(3), 245-264. https://doi.org/org/10.1037/aca0000141

Pelowski, M., Markey, P. S., Lauring, J. O., & Leder, H. (2016). Visualizing the Impact of Art: An Update and Comparison of Current Psychological Models of Art Experience. *Frontiers in human neuroscience, 10*, 160. https://doi.org/org/10.3389/fnhum.2016.00160

Porta, M., & Ricotti, S. (2017). Image grid display: A study on automatic scrolling presentation. *Visual Informatics, 1*(1), 16-24. https://doi.org/10.1016/j.visinf.2017.01.003

Potter, M. C. (2012). Recognition and memory for briefly presented scenes. *Front. in Psychol., 3.* https://doi.org/org/10.3389/fpsyg.2012.00032

Shenaar-Golan, V., & Walter, O. (2018). Art Intervention in Group Settings: A Course Model for Social Work Students. *Social Work with Groups, 41*, 1-2, 89. 102. https://doi.org/10.1080/01609513.2016.1258622

Smeds, K. (2012). On the Meaning of Exhibitions: Exhibition epistemes in a Historical Perspective. *Designs for Learning, 5*(1-2), 50-72.

Smith, J. K., & Smith, L. F. (2001). Spending time on art. *Empirical Studies of the Arts, 19*(2), 229-236. https://doi.org/org/10.2190/5MQM-59JH-X21R-JN5J

Smith, L. F., Smith, J. K., & Tinio, P. P. L. (2016). Time Spent Viewing Art and Reading Labels. *Psychology of Aesthetics, Creativity and the Arts.* Retrieved from http://psycnet.apa.org/index.cfm?fa=buy.optionToBuy&id=2016-10247-001

Spence, R. (2002). Rapid, Serial and Visual: A Presentation Technique with Potential. *Information Visualization, 1*(1), 13-19.

Spence, R., & Witwoski, M. (2103). Rapid Serial Visual Presentation. *Springer*, SpringerBriefs in Computer Science. https://doi.org/10.1007/978-1-4471-5085_3

Stang, D. J. (1974). Methodological factors in mere exposure research. *Psychol Bull., 81*(12), 1014-25.

Wahab, M. H. A., & Zuhardi, A. F. A. (2013). Human Visual Quality: Art Gallery Exhibition. *Social and Behavioural Sciences, 101*, 476-487.

Weiden, M., Khosla, D., & Keegan, M. (2012). Electroencephalographic Detection of Visual Saliency of Motion towards a Practical Brain-Computer Interface for Video Analysis. *ICMI'12-Proceedings of the ACM International Conference on Multimodal Interaction*, 601-606. https://doi.org/10.1145/2388676.2388800

Whitfield, J., & Webber, D. J. (2011). Which exhibition attributes create repeat visitation? *International Journal of Hospitality Management, 30*(2), 439-447.

Witkowski, M., & Spence, R. (2012). Rapid Serial Visual Presentation: An approach to design. Information Visualization. *Sage Publication*, *11*(4), 301-318.

Copyrights