Psychobiological determinants of ‘Blue Whale Suicide Challenge’ victimization: A proposition for the agency mediated mental health risk in new media age

Running Title: Psychobiology of ‘Blue Whale Suicide Challenge’

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Abstract

Background: An internet game called Blue Whale Suicide Challenge (BWSC) has driven scores of teenagers and young adults to commit suicide globally. The challenge preferably runs through closed social media networks and has gained notoriety for its mysterious *modus operandi*.

Methods: Descriptions of these cases, published online by credible news media around the world, were collected using combinations of keywords, viz., ‘blue whale suicide challenge’, ‘self-infliction’, ‘rescue’ etc. A comprehensive review of both, the reported descriptions and the scientific literature, was undertaken to evaluate the mental status of the victims and curators of the game, and to construct a psychobiological perspective of the victimization.

Results and discussion: BWSC victimization cases were reported from different parts of the world, particularly from Russia, Europe and India. The victims of the challenge were largely teenagers and young adults with infrequent cases in other age groups. Teenagers with complicated upbringing and negative life experiences have a higher propensity to be easier targets. Analysis of instructions used in the game reveal a motivational program that exploits fear psychology and contains elements of induction, habituation and self-infliction. All in order to mentally groom the victim for eventual suicide.

Conclusions: BWSC victimization seems to imply predatory and self-inflictive psychobiological mechanisms on the part of its curators and participants, respectively. This online agency mediated *modus operandi* uniquely exploits principles of psychology and could mischievously be applied to target individuals or masses in different settings.

Keywords: fear psychology, psychobiological mechanisms, self-infliction, suicide, victimization.

Introduction

The frequent instances of suicide and rescue from an internet game, Blue Whale Suicide Challenge (BWSC), are reflecting it to be a new mental health risk for teenagers, young adults, and psychologically vulnerable individuals worldwide¹. Examination of the curator's instructions provided in the game reveal a strategic psychological motivation program that contains self-inflicting challenges which escalate as the game progresses and ultimately culminates into suicide (Fig.1)².

The curator's instructions tend to be interactive and exploit the reward mechanism. The brain appreciates each successful self-infliction as a mark of bravery, thereby providing the necessary motivation to accept the next challenge^{2,3}. The challenges escalate and are intervened by periods of mental grooming using supportive informational content in the form of music, movies, etc. to diminish the victim's natural fear of self-infliction². Throughout the course of the game the victim is given strict instructions to maintain extreme isolation and secrecy, to share personal information and preferences with the curator, to submit evidence of each completed task (through selfies and video) and to remain faithful to the curator in order to stay in the game (some rescued survivors complained of intimidation by the curator for mentioning quitting), all of which increase subjugation and ensure a higher probability of victimization of the participant^{2,4,5}.

BWSC victimization incidences, which were first reported from Russia in 2015, have now spread to many parts of the world^{2,4}. Suicide notes from victims^{6,7}, rescued participants and drop outs from the game^{8,9}, and the arrest and persecution of the claimed game inventors and administrators in Russia¹⁰⁻¹², all confirm that the predatory threat of BWSC is real.

Because the cases of BWSC victimization are recent, they have not yet alerted the greater scientific community, so scientific literature on the possible psychobiological mechanisms implicated in this type of victimization is extremely scarce. In this article, we aim to construct a psychobiological perspective of BWSC victimization based on inferences drawn from the analysis of information available in media reports and closely related mental health issues in scientific literature. The details of cases related to BWSC were collected online from reports published by reputable news media around the world. Keywords like ‘blue whale suicide challenge’, ‘self-infliction’, ‘rescue’ etc. were used in our internet searches. From these case details, we extracted classified information about the game’s rules and instructions, strategies used by the curators to draw in participants, and behavioral characteristics of the curators and the participants. The data we acquired were analyzed in reference to the established concepts and principles of human psychology and behavior. Additionally, a review of current scientific literature was performed to correlate the behavioral components of BWSC victimization with known analogous mental disorders and to further evaluate the mental status of its victims and curators. Finally, the inferences drawn from these analyses were woven together to develop a construct of the possible psychobiological mechanisms operating in BWSC victimization. All conclusions drawn in this study are provisional and are intended to fuel further research into this issue.

An online malicious psychic program

The BWSC is a series of challenges assigned by a curator over a period of 50 days that can be extended to a person via any communication means^{13,14}. It runs through social media networks and prefers closed ones like ‘WhatsApp’ or similar others (the challenge was first noted on the

famous Russian social media network 'Vkontakte'). The curators reportedly approach potential victims through their social media profiles and activity. The instructions seem to be designed by those with adequate knowledge of psychology, which is evidenced by the games effectiveness. The BWSC originated in Russia in 2013¹⁴, appears to have attracted many volunteer curators, and is running in many independent or uncoordinated networks. No study has been reported so far on the mental health of the curators, but the examination of the instructions in the set, curator's manipulation skills, their intent of killing the potential victims, etc. indicate some probable psychopathic traits^{2,4}. An interview of the confessed inventor of the game (a 22 year old, university expelled, student of psychology) and a description provided by a 19 year old girl (arrested from Russia) hint at the same^{11,12,15}. Though, the curators may bear psychopathic traits, the paradox is that the game appears to be a psychic program containing the motivational elements for induction, habituation and preparation of the potential victim to commit suicide as final outcome (Fig. 1)^{2,3}.

Worldwide impact of BWSC

The number of BWSC driven suicides has exceeded 130 cases around the globe (The Sun, 12 Sept 2017)¹⁶, but are largely clustered in Russia, Europe and India¹⁴. Russia, where the game originated, has the highest number of cases (ibid). The sheer uniformity of the instructions used in these cases suggests that they all stem from a single source, and have evolved through experience based modifications inserted by the curators⁴. Presumably, the inventor named this game after the 'Blue whale', referencing the many cases of whales stranding themselves on land in what appears to be an act of suicide¹⁷. The game has been reported to go by other similar names as well¹⁷.

Possible psychobiological mechanisms in the BWSC

Fear is the physiological response from organisms against threatening stimuli. It is evolutionarily conserved among organisms and bears survival value. It is quite natural for an organism to perceive something uncertain as a threat, and that perception manifests avoidance behavior¹⁸. Avoidance may be gradually replaced with approach behavior in psychologically healthy organisms, to an extent that is dependent upon the exposure of the organism to threatening stimulus and consequent desensitization, especially as the organism comes to know the extent of the possible harm and ways to manage it¹⁸. Avoidance from self-infliction is an example of the fear response ensuring the survival of the organism. In contrast, fear induced avoidance could be excessive for some individuals that lack normal exposure or experiences¹⁹. Repeated exposures to threatening stimulus may lessen the induced anxiety and the fear of facing it. This is used as a treatment strategy for various phobia and panic disorders^{20,22}. Overcoming fear may be perceived as adventurous and psychologically rewarding. It's natural that daring against an unexposed fear gives a feeling of pleasure and satiation, especially upon success. Adventure games exploit this fear psychology²².

Self-infliction may be misrepresented as a win against fear, and one's own body is deemed an easy target in the absence of external restrictions. This is being exploited by the administrators of the BWSC. Presenting suicide as a challenge may allow it to be perceived as the most adventurous act. Teenagers, young adults and other individuals with a neuropsychiatric predisposition may be vulnerable to this game, and it may also be exploited by the victims of social defeat as a stress coping strategy²³.

BWSC is run by unknown administrators and preferably in a closed circuit social media network. It progresses through a course of about 50 tasks, one task per day. Administrators, who also happen to be curators in the game, start by motivating the subjects toward minor and relatively safe self-infliction challenges (Induction, Fig1.), and then gradually escalate to more dangerous challenges thereafter (Habituation, Fig.1).

Figure 1 A list of instructions used by curators in BWSC (adapted from a list given at World of Psychology, PsychCentral²). The list contains a set of instructions which seem to be based on the principles of psychology and can be sequentially categorized into induction, habituation, and preparation, all culminating into suicide as the final step).

The purpose being to induce habituation and fearlessness, arouse the participants' interest, and cause them to gradually shed their survival conflicts. By the final phase of the game the participants have shed most of their survival conflicts and the ultimate goal, suicide, is made to seem much more agreeable. (Preparation, Fig.1).

A curator also provides tender psychological care and motivates the subject to take further risks^{1,2,4}. Seemingly, in between the tasks, the participant gets advice from the curator^{1,2,4,17} to mentalize over the previous actions and to be more resolute for the next challenge. This may reduce apprehension and prepare the participant to accept the pain of minor physical inflictions as merely a cost for the pleasure or satiation of completing the next, greater challenge. Achieving this higher level target may boost the subject's self-confidence and increase his/her obedience to further instructions.

The subject is also motivated to connect with peer game participants (at the sole discretion of the curator), to reduce inner conflicts through peer confirmation and to seek higher risks and better performance. The subject is also advised to awake around 4:20 am everyday¹⁷, possibly intending to ensure enough seclusion and solace to receive interactive online instructions, complete tasks, and to reinforce their resolution toward self-infliction.

The consecutive nature of the instructions reveals that the curator is gradually programming the subject towards increasingly higher and higher self-infliction and the least amount of hesitation (Fig.1). Presenting the tasks in the spirit of a game may redirect the synaptic and neurohormonal regulation of the brain to psychologically reward the execution of a higher level challenge^{3,24}. Winning and losing have naturally magnified effects on the ego in the atmosphere of a game²⁵. So once entered into the "game", the participant may find it difficult to drop out in the face of the next higher challenge. This has been further substantiated by notes recovered from the victims.

In the BWSC game, a victim is successively prepared to take the final challenge, and a participant who reaches higher levels of the challenge may not be willing to give up, making it easier for the curator to move the participant to the highest challenge: suicide.

Possible neural correlates of BWSC suicidal behavior: An analogy to the known self-harming disorders

An adventure game where fatality is confirmed pre-hoc has not been known before (Although, there are certain games where probability of casualty is quite high, and are very popular²²). Participants of the BWSC (who followed the game up to last challenge of suicide) seem to develop along the course of the challenge a new kind of mental disorder where more complex brain circuitry may be involved. The challenge seems to revoke/bypass a physiological fear response in the participant. Fear is an elementary psychological reflex with an evolutionary and developmental basis for ensuring the survival of the organism, and escape from a predator or threatening situation often proves beneficial and contributes to the successful proliferation of the organism²⁶.

As for the other primitive reflexes, fear circuitries chiefly involve the amygdala—the nodal centre for fear response regulation, brain stem centres—dealing with reflexes, and limbic system components—dealing with emotion²⁶. Overactive fear circuitry is kept in check by the pre-frontal cortex—involved in response rationalization and decision making²⁶. Insula, anterior cingulate cortex (ACC) and medial prefrontal cortex (MPFC), which have been implicated in virtual monitoring of the self²⁷, may also be implicated in this disorder as victims try to create a brave self-image and elicit praise from the curator (and occasionally from peer participants). Desensitization against a fear stimulus may further involve striatum involved in

habituation²⁸. With habituation, the participant avoidance response against the threat of injury may be diminished — this shall essentially involve the limbic-hypothalamic-pituitary adrenal (LHPA) axis²⁹. The victim may take further self-infliction as an adventure. Winning over the fear of self-infliction may also be boosted by the concomitant resetting of endocannabinoid, noradrenergic and serotonergic systems in the brain of the participant^{30,19}.

Though deliberate acts of self-harming (DSH) or suicidal behavior (SB)—often seen in persons with borderline personality disorders (BPD)—are known in the literature^{31,32}, how the brain motivates itself to accept suicide as a sure outcome of an attempted adventure is hardly known. We assume that the brain circuitry dealing with curiosity and ego-satiation may also be implicated in such suicide challenges, which may induce the victim to get into the game and not leave at any cost.

The unique programming of the challenge sees the victim gradually desensitized. Winning over fears may activate neural circuitry implicated in reward seeking, hence the participant may develop the compulsion to continue the challenge²⁸. Research indicates that BPD patients indulge in DSH, persistent low CSF levels of certain endocannabinoids (which may be attributed to a feeling of displeasure), and suggests that fresh self-infliction may surge endocannabinoid secretion (bringing the pleasure back), which motivates the participant toward frequent self-infliction^{33,34}.

Coping with a state of emotional dysregulation had been suggested as one of the reasons for intentional self-infliction³⁵. In BPD patients, but not in controls, acts of self-infliction were found to reduce perceived stress and inner tension, and increase the threshold for perceiving and

bearing pain^{35,36}. Whether victims of BWSC carry a trait of BPD is hard to say without effective research in that domain, but it's quite plausible that a curator guided, programmed course of self-infliction may reset the limbic-hypothalamic- pituitary adrenal (LHPA) axis, hence, altering regular metabolism of the molecules maintaining this axis—neurohormones/transmitters/modulators and neurotrophins, and in turn inducing plastic changes at the synapses and neuronal circuitries leading to a change in behavior^{19,29,37}.

A real picture of the implicated brain circuitry and psychobiological mechanisms may be distinctly known once this disorder is thoroughly investigated through scientific means in potential victims, survivors and model studies.

Curator's possible psychobiology and neural correlates

Hunting as a sport of killing is well known³⁸ for generating the feelings of pleasure and reward and is generally not regarded as normal behavior (though, an alternative view may also be persistent in certain individuals). However, intentionally killing or lethally harming another member of the same species, without a conflict of interest, is unusual in human psychology and behavior and may be attributed to a psychopathological trait³⁹. The deliberate killing of humans has often been reported among soldiers and militarily trained civilians in war zones, which is invariably considered an abnormal behavior⁴⁰.

One study applied neuroimaging techniques to investigate the parts of the brain that are activated when people see pictures of soldiers killing soldiers and soldiers killing civilians in a war. The investigators found that the killing of the civilians, which created a bigger moral conflict in the participants, further activated the orbitofrontal cortex and enhanced its coupling with the temporo-parietal junction. The orbitofrontal cortex is a key brain region involved in the

regulation of emotional decisions, and dysregulation of this brain region may be implicated in (pathological) apathy and intentional killing behavior⁴¹. An associated involvement of reward circuitry (through dysregulation of dopamine synthesis and release), through the striatum and other components of the basal ganglia—which are implicated in habituation and obsessive compulsion, may also be implicated in such predatory actions⁴². (As the details on the curators of the BWSC are largely unknown, authorized reports are not available on the clinical evaluation of their behavior. Research information is scarce on the predator's psychobiology, which makes providing an approximate explanation for the predatory behavior of curators unfeasible at this stage.)

Potential victims of BWSC

Teenagers and young adults whose neural circuitries are still maturing and are yet unexposed to sufficient real life situations may be potential victims of a game which exploits fear psychology. Those with added conditions of problematic family relations, lack or absence of emotional care, experience of neglect, abuse, repeated failure, social defeat, or loss of an intimate affair/relationship may be easier targets^{23,43}. Psychologically vulnerable individuals with a history of bad life experiences, severe depression, unwanted isolation, and borderline personality disorder, may find it to be either a solution to their persistent psychological state or an end to the ongoing misery^{32,34}. Additionally, the addictive influence of the internet may add to the problem by inducing neurocognitive dysfunctions in the potential victims⁴⁴.

Unique online agency mediation of BWSC

Although the voluntary nature of participating in BWSC gives a clear-cut indication of being a mental disorder, it is much different in one mechanism from other mental disorders: being induced by an agency through a psychic program. Scarcely has any such problem been heard of in psychiatric medicine, except in rare cases where some sect or religious teacher inspired their followers to commit suicide⁴⁵. BWSC seems to have emerged due to the accessibility of advanced communication technology which allows individuals to approach other individuals in a closed circuit, and also makes it possible for individuals with deviant psychological traits to lure victims scattered geographically thousands of miles away. Dedicated research would be necessary to understand the psychobiological mechanisms that operate in such predatory online games.

Impending threat of a collective mental health risk

A *modus operandi* similar to that used in BWSC victimization may also be implied to induce social unrest, disharmony, a superstitious belief or an addictive habit from a distant location by inserting inciting informational content or motivating a susceptible population group through a psychic program online (as in BWSC). New age media has raised the possibility of online agency mediated induction of many such things and imposes a new kind of collective mental health risk for vulnerable populations transcending all geographical boundaries.

Conclusions

BWSC driven victimization appears to imply psychobiological mechanisms known for predatory and self-inflicting behavior on the part of the curators and participants respectively. The set of instructions used in the challenge qualify as a psychic program—capable of driving a participant

to execute the given tasks. The *modus operandi* used for BWSC warrants its possible replication for creating analogous issues of psycho-social importance that need appropriate attention.

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