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De-escalate: Defusing escalating behaviour through the use of interactive light scenarios

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Introduction

Almost on a daily basis, the media report of behaviour escalation: situations run out of control because individuals or groups become frustrated, agitated, often resulting in verbal or physical acts of aggression. Such situations may occur in crowded outdoor situations (public events, urban night life) as well as in small-scale indoor settings (prisons, service & help desks, psychiatric wards). Defusing escalation in any of these situations is no mean feat and generally requires the presence and active intervention of experts trained specifically for this purpose. A recent project studies the utilisation of interactive lighting design in de-escalation, by examining psychological pathways through which exposure to dynamic lighting might defuse escalating behaviour. Based on a review of the current literature, we present our vision and theoretical framework, which should provide the basis for empirically exploring light as a means for de-escalation.

Aggressive escalation

Aggression is defined in the literature as behaviour intended to hurt another person (Berkowitz, 1993). This need not necessarily refer to physical acts of violence, but may also pertain to verbal abuse. Escalation refers to “an increase in severity of aggressive means used in a given conflict” (Winstok, Eisikovits, & Fishman, 2004, p284).

Escalation of behaviour can occur anywhere and its extent may range along a dimension of intensity, from frustration and annoyance to rage. In the majority of cases, aggression and escalation occur not because they were intentionally planned (i.e., premeditated aggression), but because people

respond to perceived stress, become ignited by autonomic arousal and anger and in this process break personally held norms and revert to things they might not do otherwise (i.e. impulsive aggression; Siever, 2008). As Potegal and Stemmler (2010) argue, people themselves often experience these acts as at least partially involuntary.

Escalation typically involves a narrowing of attention and progressive failure of cognitive and executive functioning, potentially resulting in risk taking and "commitment to aggression" (Potegal & Stemmler). It consists of distinct components including patterns of peripheral physiological responses and brain activation, physical sensations, feelings, cognitions, and action tendencies. Important components often implicated in aggressions and escalation include:

Negative affect. Anger and escalation involve negative emotions, but, in contrast to for instance sadness and fear which implicate inhibition and avoidance motivations, anger and aggression involve an active approach (e.g. Litvak et al., 2010).

High arousal. On the physiological level, anger and escalation involve increased blood pressure, total peripheral resistance, and facial warming (Stemmler, 2010).

Egocentric/antisocial focus. Novaco (2010) reports that one function of anger is defensive social distancing. Escalating persons are therefore less likely to take a communication partner's perspective or have a collaborative attitude.

Narrow attention focus. Litvak and colleagues review: “Anger makes people indiscriminately punitive, [...] optimistic about their own chances of success, [...] careless in their thought, [...] and eager to take action” (p288). Others also report on

extremely emotional individuals' selective attention; they tend to attend to and recall stimuli that have content similar to the emotion they are experiencing (e.g. Tavris, 1989), and are likely to engage in heuristic rather than systematic information processing (e.g., Tiedens & Linton, 2001)

Loss of self-control and self-awareness. The essence of (unintended) escalating behaviour is that people fail to control their emotions and emotion-driven urges as a function of both internal state (stress, arousal, ego-depletion) and/or external cues (time, place, audience). Conflict, escalation, and aggression are all context-dependent. Decreased self-awareness is characterized by lowered attention to one's inner states and traits (Carver & Scheier, 1978). This prevents individuals from examining their personal norms regarding the relevant actions or behaviour (Duval & Wicklund, 1972).

Defusing escalating situations

Although there is an abundant literature on aggression and escalation, empirical work in the area of de-escalation is in fact quite scarce. The majority of this work is geared towards situations in which a professional tries to intervene in escalating situations and to manage potentially aggressive events.

Contextual and/or technological means to defuse escalation have only received scarce attention, even though current theories of aggression such as Berkowitz's cognitive neo-associationist model and Anderson and Bushman's general aggression model (GAM; 2002) assign a crucial role to situational stimuli determining whether or not an individual will engage in an aggressive response. Similarly, the Biopsychosocial Model of Arousal Regulation explicitly acknowledges the role of external affective cues in appraising situations as threat or challenge (Blascovich & Tomaka, 1996). Moreover, research on environments and anger has focused primarily on ambient characteristics of public spaces as triggers or catalysts of aggressive escalation. However, these theoretical models also imply that the presence of pleasant, positive situational cues may attenuate the readiness to engage in

aggression, and possibly buffer the adverse effects of concurrent negative stimulation.

Light as a de-escalating stimulus

Light presents a potential contextual means to impact mood, arousal and many of the components of escalating behaviour. In general, there is a remarkably universal symbolic connotation of darkness as evil, threat, and danger (e.g., Lakens, Semin & Foroni, 2012). Darkness is said to facilitate aggression against other individuals (Page & Moss, 1976), although absolute darkness was also reported to facilitate affection and sharing of intimacy between complete strangers (Gergen, Gergen & Barton, 1973). But there is more.

Light and affect. The strongest link between light and affect has undoubtedly been demonstrated in relation to seasonal depression disorder. But also outside the clinical realm light has often been related to affect and mood. Research has demonstrated that colour is a very influential attribute of lighting (Küller et al, 2006) and that especially colour evokes affective responses (Knez, 2001). Moreover, light as an affective cue may impact cognitive appraisals in stress and coping. As such, light may be employed to induce more positive affect, or to serve as a positive affective cue, in escalating situations.

Light and sociality. Very recent research has indicated that beyond influencing affect, light settings can also impact social behaviour. For instance Steidle and colleagues (2012) demonstrated that brightness influenced cooperative behaviour. Similarly, light may impact an escalator's antisocial or egocentric focus and induce a more social orientation.

Light and attention. Shifts of visual attention can be goal directed or stimulus driven. Stimulus-driven attention shifts are independent of the individual's goals or actions: they capture attention due to specific attention-driving (bottom-up) characteristics of the stimulus. Light has since long been employed as a means to direct attention: consider for instance the use of stage and

spotlights in theatre. But also outside the theatre, dynamic and static characteristics of light may inherently capture the attention of escalating groups or individuals and direct it to external cues or objects, making them more aware of for instance bystanders, social norms, or the consequences of their actions. In addition, directed light on the escalating situation could heighten self-awareness, which is characterized by greater attention to one's inner states and traits (Carver & Scheier), which subsequently triggers individuals to examine their personal norms regarding the relevant actions or behaviour and behave more accordingly to these norms.

Light and self-control. Research has demonstrated that light increases alertness and performance on cognitive tasks (e.g. Smolders, de Kort & Cluitmans, 2012). Neuroimaging has indicated that light during daytime increases activity in the thalamus and prefrontal cortex (Vandewalle et al., 2006). Crucially important, the prefrontal cortex is the area where executive functioning is said to reside, and perhaps also self-regulation.

Light and arousal. Although empirical proof is scarce, light has since long been related to arousal and relaxation. In fact, lighting is already successfully employed in for instance scanning practice in hospitals for lowering patient arousal during MRI scans or during PET uptake (e.g. Philips Ambient care concept, e.g., see Vogel et al., 2012). Typically, dim and warmer colours are associated with lower autonomic arousal.

Light and safety in outdoor environments. The relationship between light and perceived safety at night is intuitively strong and well established empirically (e.g., Welsh & Farrington, 2008). As such, street lighting is essential for the freedom to go out at night, in particular to those vulnerable to or fearful of personal attacks (e.g. Keane, 1998). Research has only recently started to investigate how dynamic lighting affects safety perceptions; demonstrating for example that providing light in pedestrians' immediate surroundings is more important than illuminating the road that lies ahead (Haans & de Kort, 2012). Although subject

to debate, street lighting is also generally accepted as an effective means for crime prevention. Particularly important in this regard is that physical barriers such as for instance fences or the visual presence of police or MPs have been shown to act as cues for aggression and may thus facilitate escalation rather than defuse it (Carlson et al, 1990). Lighting, in contrast, does not throw up a physical barrier and may therefore be more successfully applied as a soft – non-aggressive – means to manage mood and behaviour in escalation.

In sum, the literature described above suggests several pathways for light to target emotional and/or behavioural components of escalation. Light could facilitate the reduction of arousal and negative affect, and induce a more positive and social orientation, function as an affective cue in situational appraisal, increase awareness of personal and social norms, and enhance self-control. Moreover, it may increase perceived safety in urban areas and increase the beneficial effect of restorative mediated content in ambient experience and support rooms.

Innovation potential

The use of dynamic lighting for defusing escalating situations is new and innovative. The application of dynamic coloured lighting has only recently become available, with the development of LED technology and its enhanced controllability. LED's main characteristics such as its energy efficiency, its dynamic controllability in colour and intensity, its robustness, all play a crucial role in opening up this new use potential.

The ideas and insights generated in the current project will not only be tested in controlled laboratories. Light principles tested and deemed successful in the laboratory need to be carefully and sensitively integrated in their contexts of use and tested there. The current project will therefore make use of experiential design landscapes, which means that investigations and experimental manipulations will be implemented while regular life continues. The first is 'Stratumseind' a popular, yet aggression-prone downtown area with

numerous cafes and bars. The second is a mental care facility.

At the conference, we hope to present this theoretical framework and vision, and discuss it with the experts present, to explore the potential for the present project and related goals.

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