



**INSTITUTIONEN FÖR SOCIOLOGI
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INTOXICATED WITNESSES TO IPV:

The Effects of Alcohol Intoxication and Repeated
Interviewing on Perceived Aggression

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Master thesis in Criminology, 30 higher education credits.

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Abstract

Title: Intoxicated witnesses to IPV: the effects of alcohol intoxication and repeated interviewing on perceived aggression.

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Aims and objectives: Many witnesses law-practitioners deal with are intoxicated, especially witnesses to violent crime such as intimate partner violence. There is little research, however, regarding how alcohol influences witnesses' perception of aggression and how interview strategy can moderate this influence. This study examined to what extent alcohol intoxication and time of interview affected perceived aggression in an intimate partner violence scenario.

Method and data: One hundred and thirty-five ($n = 135$) participants were randomly allocated into one of three groups based on blood alcohol content (BAC); a non-alcohol group, a moderate alcohol group (BAC = 0,04 – 0,08) or a high alcohol group (BAC = 0,08 – 0,15). Participants consumed drinks either containing juice and vodka or only juice in a laboratory setting after which they witnessed a film depicting a staged IPV scenario. The interview condition was operationalized by interviewing fifty percent of the participants twice; once in direct association to the film and again one week later. The other fifty percent were only interviewed after a one-week delay.

Results: Results indicated that during the direct interview, moderately intoxicated witnesses rated neutral demeanor in the film as more hostile and physical aggression as less severe compared to sober witnesses. During the repeated interview, the ratings of intoxicated and sober witnesses did not differ. Highly intoxicated participants did not differ from the sober during the direct interview but suffered memory loss during the delayed interview and rated aggression as less severe. The repeated interview resulted in a more stable aggression assessment than the delayed, highlighting the import of repeated interviewing for intoxicated witnesses. Criminological relevance and future research are discussed.

Key words: *Intoxication, witnesses, interview, memory, alcohol, aggression, intimate partner violence, alcohol myopia theory, appraisal disruption theory, dual processing system.*

1. Introduction

It is generally agreed that alcohol and violence have a strong relationship. Alcohol intoxication leads to more aggressive behavior as well as more leniency on aggression from others. Alcohol intoxication also serves as a trigger for physical violence against a partner, a crime that most often occurs in the couple's home without witnesses. In situations where such violence can be witnessed by third party adults, alcohol is also often present. This serves a problem since law practitioners often dismiss intoxicated witnesses as unreliable. Furthermore, perception of aggression is askew during alcohol intoxication which could make witnessing the, often subtle public expression of intimate partner violence problematic. As dealing with intoxicated witnesses or alcohol-induced violent crime is a common presence in police work it is vital to try to understand alcohol's role in this context.

1.1 Aim and Research Questions

The aim of the present study is to examine the possible effects of alcohol intoxication on witnesses' perception of the aggression displayed in a film depicting an IPV scenario and if these perceptions are different depending on when the interview with the witness is conducted. The following research questions are proposed: does and if so, how does alcohol intoxication affect a witness perception of aggression? Do and if so, how do these perceptions differ depending on when the interview is carried out? These questions are studied using a quantitative approach, analyzing data gathered in an experiment by the Department of Psychology at the University of Gothenburg. Below, the theoretical framework on alcohol's influence on witness performance as well as characteristics surrounding the crime of IPV will be presented.

1.2 Intimate Partner Violence

Intimate partner violence (IPV) is defined as physical, sexual or psychological harm done by a current or former partner (SOU, 2006:65). It often leads to more severe social, psychological and economic consequences than other forms for violent crime due to the relationship between victim and offender (BRÅ, 2009). In the United States, IPV is considered a public health issue and is the most common form of violence from which women suffer (Tjaden & Thoennes, 2000; WHO, 2010). Certain issues with IPV make it particularly hard to investigate and these cases are often not given priority by the police. The primary issue with studying this form of violence is that it suffers from severe underreporting (Capaldi, Knoble, Shortt & Kim, 2012). Furthermore, contrary to the general belief held by both law practitioners and the general public, violence between intimate partners is not committed in a vacuum and cannot be considered a series of isolated events but rather a continuous presence in the relationship (Dobash & Dobash, 1984). Subtle and severe forms of psychological and emotional abuse can influence the relationship for years while acts of physical violence are often triggered by a specific event (Dobash & Dobash, 1984; Murdoch, Phil & Ross, 1991; BRÅ, 2009). It is problematic for the victim to notice when a problematic relationship transitions into a criminally abusive one and isolating separate cases of IPV adds to the complexity of investigating the crime. The most prominent issue with investigating cases of IPV is the fact that most offenses are committed in the offender's or the victim's home where no witnesses are present (BRÅ, 2009; Wilkinson & Hamerschlag, 2005). Only between 13-23% of reported IPV cases are set in public environments where the offense can be observed by adult witnesses and only about 20% of IPV cases are reported by a third party (Dobash & Dobash, 1984; Wilkinson & Hamerschlag, 2005). The public settings where IPV can be witnessed are also where said witnesses are often intoxicated such as in bars, restaurants or house parties (Dawson & Gartner, 1998). Alcohol has

been found to be one of the most prominent and stable predictors of IPV, even when controlling for other relationship factors such as jealousy, anger, criminal history, drug use, religion and general relationship satisfaction (Capaldi, Knoble, Shortt & Kim, 2012; Dingwall, 2006; Murdoch, Phil & Ross, 1991). For example, in the U.S., rates of domestic abuse were found to be 15 times greater when the husband was intoxicated compared to cases with sober husbands (Bégué & Subra, 2008).

1.3 Intimate Partner Violence in Sweden

IPV and its predictors including socio-economic status (SES), personality traits and substance use have been the focus of many international studies (see Rodriguez, Lasch, Chandra & Lee, 2001 for a review). It is also important to consider country-level contextual differences in prevalence and expressions of IPV. In Sweden, IPV has been found to have more complex and extensive consequences than random violence or assault as it often leads to exacerbating social problems such as social isolation, mental health issues, financial problems, problems finding safe living accommodations, problems maintaining employment and legal family disputes (BRÅ, 2014; BRÅ, 2015; SOU:2006).

Any attempts to study IPV is hindered by the victims' reluctance to report the offense to the police due to fear of consequences and lack of trust in the police. Using anonymous self-report studies is a valuable instrument to try to circumvent this problem. In 2002 Brå (the Swedish National Council for Crime prevention), was tasked by the Sweden's ministry of Justice to investigate the current trend in violence against women and to assess the frequency for IPV against women. Using a data from both police reports and an anonymous survey the report showed that 0,9% of women had been victims of IPV the past 12 months and that, out of these,

none had reported the offense to the police. Concerning the motives behind the offense, alcohol was listed as one of the most prominent.

Subsequent surveys by Brå have continued to measure the extent of IPV in Sweden with the added attempt to further explore possible gender differences and the characteristics of the violence. In 2005 a self-report survey examining the prevalence of IPV in same-sex relationships found that 10% of the respondents (2000 in total) had been abused by their current partner (Holmberg & Stjernqvist, 2005). This study also shows that IPV is not to be considered an isolated event but rather a consistent presence in a relationship. In 2012 only 3,9% of victims of intimate partner violence reported the incident to the police (BRÅ, 2014). The reason given for not reporting the crime is that the victim considered the incident to be a trifling thing or that they sorted it out on their own (ibid.). The normalization and tolerance of violence in a relationship contributes to the underreporting of the crime. Accepting mild forms of abuse also leads to the escalation of the violence. The process of normalizing violence and reluctance of reporting it to the police makes reliance on third-party witnesses even more essential when investigating IPV.

Concerning possible gender differences in IPV the extent to which men are victims of intimate partner violence is to a large extent unknown due to the low frequency with which they report the crime. Few studies manage to capture the gender dispersion in IPV and it seems to be more complicated than is assumed by the general public and law practitioners. During 2012, 6,8% of the population in Sweden reported that they had been the victims of IPV (BRÅ, 2014). During this year, the number of women victimized by IPV was nearly identical to the number of men (7,0 % of women and 6,7% of men). In an international meta-analysis from 2000 conducted on a total of 82 studies on intimate partner violence it was found that women are equally prone or

more prone to using physical violence against their spouse as men are (Archer, 2000). It is only when looking at different types of IPV where gender differences are more clearly pronounced (Archer, 2000; Johnson, 2005). The major gender difference in IPV seems to be that women are subject to more severe forms of violence and more systematic and repeated violence than men (BRÅ, 2008; BRÅ, 2009; Johnson, 2005). This leads to more severe social, psychological and financial consequences for female victims of IPV compared to male (BRÅ, 2009).

At the time of writing, the most recent self-report survey conducted in Sweden (2016) explored the situational circumstances for violent crime in order to conceptualize gender differences in intimate partner violence. Female victims of violent crime report that 51 % of the offenses took place in their own home while only 13 % of violent crime against men took place in their home (BRÅ, 2017). Strong gender differences were also found in the relationship to the offender; for women, in 45 % of cases of violent crime the offender was a family member or partner while for men, only 10 % (ibid.). The authors of this report also stress the probability that the gender differences are even larger due to underreporting.

2. Theory

Alcohol has been found to have high correlation with most violent crimes including IPV (BRÅ, 2015; Murdoch, Phil & Ross, 1991; NCADD, 2016). Witnesses to IPV are only present in approximately 22 % of the cases and in 50 % of these, the witnesses are intoxicated (Greenfield, Rand, Craven, Perkins, Ringel, Warhol, Matson & Fox, 1998). It is clear that alcohol serves an important role in IPV, making its effects witnesses to the crime important to understand. According to the National Council on Alcohol and Drug Dependence (NCADD) approximately 75% of victims of IPV in the US, state that alcohol was involved. Findings in Europe and Scandinavia seem to corroborate these results (Dingwall 2006; BRÅ, 2015). However, the

assumption held by the general public and most law practitioners seems to be that intoxicated witnesses are easily dismissed as unreliable and lacking credibility (Kassin, Tubb, Hosch & Memon, 2001). In order to examine the effects of alcohol intoxication on witness performance in complex judgment processes – such as assessing aggression in IPV – it is necessary to outline relevant theories and recent findings in the field.

2.1 Dual Processing System

A cognitive approach to why and how alcohol intoxication impairs cognitive functions can be found in the dual processing system theory (Tversky & Kahneman, 1973; Kahneman, 2011). According to this theory, cognition uses two different systems; system 1 and system 2. System 1 processes information fast, intuitively and automatically. This system is however, more prone to heuristics, biases and the use of stereotypes. System 1 is assumed to be more relied upon during high cognitive load during for example alcohol intoxication. System 2 processes information more analytically using effortful cognitive processes and evaluates and analyzes information more deeply and thoroughly. Direct evidence indicating the reliance on system 1 during alcohol intoxication is sparse but findings from the field of forensic psychology and neuropsychology supports these ideas (Eckardt et al., 1998; Koelega, 1995). Alcohol intoxication has been found to inhibit the integration and association of new information to existing knowledge and previous, similar experiences (Sayette, 1993; Khaneman, 2011) This in turn leads to more utilization of heuristics, automatic behavioral schemas and stereotypes – all features of system 1 (ibid.)

2.2 Alcohol myopia

Another theory adding to the explanatory framework on alcohol's effect on witnesses to violent crime and IPV is the alcohol myopia theory developed by Josephs and Steele (1990). They find

evidence that alcohol reduces attention capacity in time and space, effectively reducing perceived anxiety for oncoming anxiety-inducing events. Josephs and Steele (1990) then suggest that anxiety is mediated consciously and not only by automatic processes. Alcohol reduces cognitive and attentional resources which leads to a narrower field of attention, where less salient and peripheral cues are neglected (Josephs & Steele, 1973; Josephs & Steele, 1990; Steele & Josephs, 1988).

The more complex an activity is the more cognitive and attentional resources it requires. An attention-demanding activity is then in competition with other stimuli in the environment. Should a stress-inducing cue then be introduced while most of the attentional capacity is in use by the primary activity, less focus will be paid the stressor (Josephs and Steele, 1990; Schreiber Compo, Evans, Carol, Villalba, Ham, Garcia & Rose, 2012). According to this logic, anxiety induced by a stressor should vary with the complexity of the activity being done.

A simple, non-taxing activity requires little attention and leaves more resources available for the stressor. The more attention available for the stressor, the more anxiety it will induce. Conversely, a more complicated activity should occupy more resources and result in less anxiety induced by the ignored stressor. However, in intoxicated subjects, presenting an anxiety-inducing factor without an activity to preoccupy the attentional resources results in experiencing more anxiety than sober subjects (Josephs & Steele, 1990). While sober, we employ counter-measures to cope with anxiety, such as rationalizations and memories of other times we performed well in similar scenarios. During the impaired cognitive and attentional state of alcohol intoxication, no resources are available for such coping mechanisms and the stressor is left unchecked (*ibid.*). The model then presents both anxiolytic (anxiety-reducing) and anxiogenic (anxiety-increasing) effects of alcohol depending on the level of taxation of the

activities occupying the subject. The contexts in which normal social drinkers find themselves in often provide appropriate and pleasant distractions, such as conversations, which prohibits cognitive resources to be spent on stressful thoughts. This helps explain the anxiolytic effects of alcohol most social drinkers enjoy. The relationship between alcohol intoxication and allocation of cognitive and attentional resources is important to understand when exploring witness performance in complex judgments such as IPV situations.

2.3 Appraisal Disruption Model

The alcohol myopia model argues that alcohol intoxication as a source of cognitive load decreases available attentional and cognitive resources and impairs management of multiple, simultaneous activities. Without distractions, however and with a sufficiently salient cue to focus on, alcohol intoxication would not necessarily diminish automatic processes of appraisal (Lau, Pihl & Peterson, 1995; Steele & Josephs, 1988; Sayette, 1993).

Sayette (1993) proposes a slightly different model for explaining alcohol's effects on perception and cognitive processes in the appraisal disruption model. According to this model, alcohol inhibits anxiety due to lowered emotional activation during stressful events, limiting attention resources and diminishes the capacity for cognitive association. This model relies on two core concepts of heuristic cognition; the automatic process of appraisal and the system for consciously directed attention. Appraisal here refers to the process of categorizing events as beneficial, neutral or harmful/stressful. Stressful stimuli are categorized as such through the process of association to nodes in a network where previously encountered stressful stimuli are stored. It is through this process of association to similar events, previously encountered that new stimuli are appraised. Alcohol intoxication disrupts the process of appraisal by lowering the amount of associations a stressor can reach, effectively lowering the experienced anxiety.

This effect is the most pronounced for stressors that are difficult to appraise. So Sayette (1993) includes the redistribution of attention to direct, salient environmental cues established in the myopia theory but also points out disruption in the automatic process of appraisal. This model then incorporates the findings that even without distractions, alcohol has been found to limit depth of cognition and number of associations made from environmental cues (Steele & Josephs, 1988; Steele & Josephs, 1990; Sayette, 1993; Sayette 1999).

3. Hypotheses

Based on the theoretical framework and recent findings (Ogle & Miller, 2004; Hildebrand Karlén et al., 2015; Hildebrand Karlén et al., 2017a) and that alcohol intoxication leads to an increased propensity to perceiving aggression in others (Clements & Schumacher, 2010; Taylor and Chermack, 1993) it is hypothesized that intoxicated participants will perceive the neutral interaction of the film as more aggressive compared to sober individuals (Hypothesis 1a). Based on the appraisal disruption model (Sayette, 1993), the anxiolytic effects of alcohol (Ito et al., 1996; Ogle & Miller, 2004; Parrott et al., 2012) and previous findings (Hildebrand Karlén et al., 2015) it is also hypothesized that alcohol intoxicated participants will perceive the physically aggressive interaction of the film as less severe compared to sober participants (Hypothesis 1b). Since no differences were found in perceived aggression during the verbally aggressive interaction of the film by Hildebrand Karlén et al. (2017a) no hypotheses were made concerning this part.

Concerning time of interview - directly following the material or after a one-week delay – it is predicted that the level of intoxication will have a strong bearing on how aggression ratings differ. Sober participants suffer no attention- or memory consolidation impairment and their ratings will likely not change depending on time of interview. Moderately intoxicated

participants are predicted to experience the anxiolytic effects of alcohol and will suffer from impaired judgment due to reduced stress and disrupted appraisal (Anderson & Bushman, 2002; Deffenbacher, 1991; Sayette, 1993). It is, however unlikely that that memory consolidation will be impaired at moderate levels of intoxication (Ogle & Miller, 2004; White & Best, 2000; Yuille & Tollestrup, 1990). Therefore, the ratings of moderately intoxicated participants will differ significantly from sober during the direct interview but not during the delayed. Highly intoxicated participants are more likely to suffer the sedating effects of alcohol and memory consolidation impairment (Clements & Schumacher, 2010; White, 2003; Zoethout, et al., 2011). Therefore, their ratings in comparison with sober participants', will differ little during the direct interview but significantly more so during the delayed interview. In other words, it is hypothesized that during the direct interview, only moderately intoxicated participants will differ from sober while during the delayed interview, only highly intoxicated participants will differ from sober (Hypothesis 2a).

For the participants who received two interviews, it is believed that aggression ratings will converge after one week. During the direct interview, the impaired judgment and anxiolytic effects of alcohol will result in deviating ratings for the intoxicated participants but will dissipate after one week (Hildebrand Karlén et al., 2017b; Mather & Sutherland, 2011). Possible memory consolidation impairment for highly intoxicated participants will be counter-acted by repetition so there is no predicted difference between intoxication groups during the second interview. Put specifically, during the direct interview intoxicated participants will rate the displayed aggression differently but during the repeated interview, the intoxicated participants' ratings will converge to those of the control group (Hypothesis 2b).

Concerning the difference in perceived aggression due to the number of interviews, it is predicted that the repeated interview condition will show more stable aggression ratings than the delayed interview condition. If intoxicated participants are given a direct interview immediately after witnessing the material this will anchor the aggression ratings and serve as an important rehearsal opportunity (Yuille & Tollestrup, 1990). The subsequent interview will then result in aggression ratings very similar to the sober participants' ratings. If not presented with a rehearsal opportunity, the material witnessed will be subject to impaired memory consolidation and disrupted appraisal (Anderson & Bushman, 2002; Sayette, 1993). This will yield more deviating aggression ratings during the delayed interview. So therefore, it is hypothesized that the aggression ratings will differ significantly between the repeated interview and the delayed interview condition (Hypothesis 2c).

4. Recent research

4.1 Time of Interview

It is well established that alcohol is highly correlated with IPV and that IPV cases where adult witnesses might be present are also where alcohol is present (Murdoch, Phil & Ross, 1991). Alcohol's detrimental effects on cognition, perception and memory are also well explored (Josephs & Steele, 1990; Sayette, 1993) but less is known about alcohol intoxication's effects on memory performance specifically for witnesses to IPV. Since intoxicated witnesses make up a significant presence in law enforcement and are still easily dismissed as lacking credibility (Evans, Schreiber Compo & Russano, 2009; Yuille & Tollestrup, 1990) it is crucial to understand how and when to conduct the interview in order to obtain the most accurate and detailed report as possible.

Time decays memory and conducting an interview directly following the event has the benefit of limiting the decay of memory retention (Odinot & Wolters, 2006). While repetition improves memory completeness repeated recall has, however been found to have little effect on accuracy of memory (Baddeley, 2000; Hildebrand Karlén, Roos af Hjelmsäter, Fahlke, Granhag, Söderpalm Gordh, 2015; Odinot & Wolters, 2006). Ethanol inhibits the main function of the hippocampal region by suppressing inter-neuron activity which undoes some of the benefits of repetition (White & Best, 2000). Generally, longer delay between witnessing material and initial interviewing leads to lower accuracy and lower confidence in memory (Hildebrand Karlén et al., 2015; Hagsand, Roos af Hjelmsäter, Granhag, Fahlke & Söderpalm Gordh, 2018; Odinot & Wolters, 2006). This highlights the advantages of conducting the first interview in as close a relation to the event as possible.

Repeated interviews are almost unavoidable in larger criminal investigations; the witness may be called to testify again during the investigation seeing as a lot of information may only be recalled after a certain amount of time. The witness may also be asked to testify during the trial to give a first-hand recount the event. However, repeated recall has been found to have both beneficial and negative impact on the correctness of the memory. Reviews of actual eye-witness reports to a violent crime show decay in memory for certain details (e.g. eye-color and height and weight estimations) but that general amount and particularly accuracy of information in free recall accounts, remained relatively high for up to five months (Birnbaum, Parker, Hartley & Noble, 1978; Read, Yuille & Tollestrup, 1992; Yuille & Cutshall, 1986).

Testing the differences in memory retention of intoxicated eyewitnesses in direct interviews and interviews one week later shows that an initial interview serves as very important retrieval practice and increases memory retention with up to 25% in subsequent interviews (Yuille, 1973;

Yuille & Tollestrup, 1990). This effect is so significant that intoxicated witnesses reported a more complete memory during the second interview one week later than sober witnesses who did not receive an immediate opportunity to practice (ibid.). Similarly, memory retention studies on intoxicated witnesses given a direct interview while intoxicated and a second interview only 24 hours later show a significant increase in completeness and stable accuracy of memory retention (La Rooy, Nicol & Terry, 2013; Van Oorsouw & Merckelbach, 2012). It seems that repeated interviewing not only results in a memory that is stable and reliable over time but often yields more information during the second round of interviews – especially for witnesses that were intoxicated during the immediate interview.

Repeated interviews may also prove problematic later on in investigations as witnesses giving new information or changing previous statements in subsequent interviews may cast doubt on the reliability of the witness. The problem of lowered credibility could be especially pronounced for intoxicated witnesses as new information or corrective information may be attributed to the effects of alcohol, decreasing the usefulness of the witness even further.

In a study from 2015, Hildebrand Karlén et al. examined the difference in memory retention in direct and delayed interviews for alcohol intoxicated witnesses (BAC 0,08 – 0,15) to an IPV scenario. All witnesses gave less accurate and less complete reports in the interview one week after witnessing the material compared to the direct interview. However, the participants that received both a direct interview and a repeated interview one week later gave a significantly more complete report during the second interview compared to witnesses who only received a delayed interview. The authors conclude that at the BAC levels tested in this study, it is pertinent to interview witnesses in direct association to witnessing the event in order to counteract memory decay.

4.2 Alcohol on Perception of Aggression

The violence expressed in IPV cases is, as explained above, not always physical and can be difficult to see for what it truly is. Accurate assessment of aggression – be it physical, verbal or psychological – often require an alert observer. The high correlation between public expressions of IPV and alcohol intoxicated witnesses raises the need to understand how alcohol influences a witness' perception of aggression.

Alcohol intoxication has been found to increase the likelihood of eliciting aggressive attitudes, perceiving aggression in others and increases the severity of aggression (Anderson & Bushman, 2002; Bushman, 1993; Bushman & Cooper, 1990; Ito, Miller & Pollock, 1996). In particular, intoxicated men compared to sober men and women (intoxicated or sober) have been found to perceive a greater degree of hostile behavior, display a greater degree of aggression-oriented goal selection, greater utilization of aggressive responses and greater severity of aggression in those responses (Ogle & Miller, 2001).

Alcohol has been argued to trigger aggression in both direct and indirect ways; directly it serves as a neuropharmacological anesthesia, numbing the center of the brain controlling and inhibiting aggressive behavior while at the same time increasing physical and psychological arousal. Indirectly it impairs the higher cognitive processes for risk-assessment and reduces awareness ultimately resulting in aggression being found as a more acceptable and appropriate reaction (Bushman & Cooper, 1990; Parrott, Gallagher & Zeichner, 2012).

Besides hostile behavior, alcohol intoxication is also linked to the hostility bias; the increased frequency and severity of perceived aggression in others even during neutral interactions (Clements & Schumacher, 2010; Ogle & Miller, 2004; Taylor & Chermack, 1993). In a review article, Mather and Sutherland (2011) outline the arousal-biased competition model. They find

that stimuli are constantly competing for our attention where more salient stimuli, either made salient by goal selection or by emotional arousal, are directed more attention and are therefore consolidated into long term memory more easily. If something or someone is initially perceived as more arousing or threatening, this is where attention allocated and during time of high cognitive load, the attention capacity is already limited resulting in an even narrower focus. The idea that during cognitive load the competition for attention is even more pertinent and emotionally arousing stimuli – such as aggressive behavior - will dominate the attention allocation hierarchy.

The appraisal-disruption model offers a possible explanation to the increased level of displayed and perceived aggression through alcohol's anxiolytic and disinhibiting effects. Failure to recognize long-term disadvantageous consequences of one's behavior in both the harmful consequences of one's actions as well the risks of harm onto oneself in hostile situations during the impaired cognitive and attentional state of alcohol intoxication would lead to increased risk-taking and anti-normative behavior. Furthermore, the general threshold for aggression is lower during alcohol intoxication which increases both frequency and severity of aggressive behavior as well as perception of aggression in others (Ito et al., 1996; Lao, Phil & Peterson, 1995).

Hildebrand Karlén, et al. (2017a) studied alcohol intoxication's effect on participants' perception of aggression of a man and a woman in a film depicting an IPV scenario and found that a moderate dose of alcohol (0,7g/kg) made participants perceive both parts' physical aggression as less severe and their neutral behavior as more hostile. The complex effects of alcohol on perceived aggression are, by the authors attributed to the anxiolytic and attentional capacity reducing effects of alcohol proposed in the alcohol myopia and appraisal disruption theories (Hildebrand et al., 2017a; Josephs & Steele, 1990; Sayette, 1993).

4.3 Dose-dependent Differences

Vast amounts of studies show uniform evidence that alcohol impairs cognition, memory consolidation and retention as well as perceived aggression in others (e.g. Bushman & Cooper, 1990; Curran, 2006; Ito et al., 1996; Josephs & Steele, 1990; Sayette, 1993; White, 2003). In which ways and to what degree is less evident. The variation in effects may, in part be due to difference in alcohol dose, as some studies indicating no or low effects of intoxication on memory and judgment-processes use relatively low levels of BAC and studies using higher doses reveal more pronounced effects (Curran, 2006; Hildebrand Karlén, 2018; La Rooy, Nicol & Terry, 2013). Different doses of alcohol intoxication elicit impairment in different cognitive functions; even in doses too low to cause an overall impairment of cognitive performance certain cognitive-behavioral changes can be seen (Field, Wiers, Christiansen, Fillmore and Verster, 2010; Van Oorsouw & Merckelbach, 2012). In a laboratory study on difference in SRD (stress response dampening) due to alcohol dosage, Moberg, Weber and Curtin (2011) saw a linear effect of BAC level (0.04%, 0.075% and 0.11%) on SRD effects. The highest BAC levels showed the largest SRD effect and the lowest response to threat levels (color-cued shock administration). The authors conclude that failure to account for dose differences in similar studies may explain the inconsistent findings.

Alcohol has a been found to have a dualistic, dose-dependent effect on cognitive impairment resulting in an activating or arousing effect on low to moderate doses and a sedating effect on higher doses – this notion has been supported by recent findings (Hagsand Roos af Hjelmsäter, Granhag, Fahlke & Söderpalm Gord, 2013; Hildebrand Karlén et al., 2018) as well as research reviews on the matter (White & Best, 2000; Zoethout, Delgado, Ippel, Dahan, & van Greven, 2011). The activating or arousing effects of alcohol found in lower doses trigger an increase in

both utilized and perceived aggression in others while at higher doses sedating effects cause cognitive, attentional and memory consolidating impairments (Clements & Schumacher, 2010; Hendler, Ramchandani, Gilman & Hommer, 2013; White & Best 2000).

5. Method

5.1 Participants

The data used in this study was collected by Hildebrand Karlén et al. (2017b). A total of 135 participants were used. They were recruited using posters in and around the University of Gothenburg in Sweden. With all applicants a telephone screening was conducted (approx. 20 min.) by a trained research assistant using the Alcohol Use Disorder Identification Test (AUDIT; cut-off scores used M = men: 3-15; women: 3-13). With all applicants who were considered healthy, non-problematic drinkers (if a problematic attitude to alcohol was indicated, the possibility to speak with a professional was presented), ages 19 – 35, with BMI 19-26, who did not use medication or drugs a more extensive screening was performed (approx. 60 min.). This screening consisted of a medical examination and psychiatric screening (AUDIT range: 3-14, $M = 6,49$, $SD = 2,65$), an interview with a licensed psychologist screening for high-risk responses according to AUDIT and SCL-90; a psychiatric symptom checklist. The risk factors were medicating, alcohol sensitive medical conditions, current or history of alcohol/drug abuse, BMI <19 or >26, psychiatric disorders, non-fluent Swedish skills or working night shifts. After the second screening, all participants were read and signed a consent form. The day before the experiment they received an email telling them to eat before arriving at the laboratory. The Regional Ethical Review Board in Gothenburg approved the experiment. The two screening

procedures excluded 135 applicants. Another four were unable to participate and two participants' responses were lost due to technical difficulties.

5.2 Design and Procedure

The design used was an experimental mixed group design 3 (sober vs. moderate intoxication vs. high intoxication) x 3 (direct vs. one-week delay vs. one-week repeated interview). The target BAC was 0.08 for which an alcohol dose of 0.75g/kg for women and 0.8g/kg for men was used. The difference in administered dose for men and women was due to a dose of 0.7g/kg used in a previous study by Hildebrand Karlén et al. (2015) resulted in different BAC-levels for men and women. For someone weighing 70kg the administered alcohol dose equals approximately 4-4.5 glasses of wine (150 ml) or beer (33cl. 5% alc.) and generates a BAC-level of approximately 0.08 within 15 minutes. The participants were randomized into interview groups; repeated interview (n = 68: 33 men and 35 women) and delayed interview (n = 69: 33 men and 34 women) and alcohol groups; alcohol group (n = 70: 34 men and 36 women) and non-alcohol group (n = 67: 33 men and 34 women).

The experiment was conducted in a laboratory designed as a living room at the Addiction Biology Unit (Section of Psychiatry and Neurochemistry, Institute of Neuroscience and Psychology) at Sahlgrenska University Hospital, Gothenburg University. When participants arrived at the laboratory, in groups of two to five their breath alcohol concentration (BAC) was tested to be 0.00 (using Alert J5, Alcohol Countermeasure System Corp., 2006 portable breathalyzer). Then the participants were weighed and informed by the experiment leader about the procedure and whether or not their group would consume alcoholic drinks.

The participants then consumed their drinks during 15 minutes. The group in the alcohol condition were served a solution of either 0.8g/kg alcohol (for men) or 0.75g/kg (for women)

made of Absolut Vodka 40% mixed with pulp-free orange juice. The non-alcohol group drank only pulp-free orange juice. Both groups then rinsed their mouths with water to generate a more accurate BAC result. The BAC of the alcohol-group was measured every 15 minutes starting five minutes after consumption. The participants then watched an IPV-scenario on a TV three meters away after which they performed a filler task for 10 minutes. Then 50% of the participants – the repeated interview group – were interviewed individually about the IPV scenario. Afterwards, participants in the non-alcohol group left while the alcohol-group stayed and had their BAC-levels monitored until it reached 0.04 after which they were sent home by taxi. For the delayed interview condition, non-alcohol participants were sent home directly after completing the filler task while the alcohol-group stayed until their BAC reached 0.04 and were then sent home via taxi. One week later, all participants returned and were interviewed (50% for the second time – the repeated interview condition and 50% for the first time – the delayed interview condition). Compensation for participation was 350 SEK (approx. £30) or three movie tickets.

5.3 Material

Film. The film (11.5 minutes long) depicted an IPV scenario in a home between a man and a woman. It consisted of three distinct phases of social interaction between the two: an emotionally neutral phase where the two conversed about their day and finances in the kitchen, a verbally aggressive phase where the two leaves for the living room and begin arguing about the finances while sitting in the sofa, and a physically aggressive phase where they enter the hall where their arguing turns to physical violence from both parts. Each phase lasted 3 minutes and 50 seconds. It is of import to note that while both the man and the woman were physically

violent the majority of the woman's physical aggression was defensive in nature and the man's aggression was offensive.

Filler task. To prevent participants from rehearsing the material viewed and to counter-act the recency effect (where the last presented material is best remembered) participants completed a 10-minute word task where they had to write as many possible words from a 14-letter word presented to them. The task was completed individually and in silence.

Interview. The participants in the repeated interview condition were interviewed directly after completing the 10 minutes filler task and again one week later. The participants in the delayed interview condition were only interviewed after one week. The interview consisted of four consecutive parts. The first part consisted of free recall on the entire IPV scenario. Parts two, three and four were open recall followed by open questions about each part (the neutral, the verbally aggressive and the physically aggressive) of the film respectively. Parts two, three and four also ended with a rating of the perceived level of aggression displayed by the man and the woman during that phase of the film; "how aggressive did you perceive the man and the woman respectively to be during the time they were in the kitchen/living room/hall?" where the answers ranged from 1 "not at all aggressive" to 6 "extremely aggressive".

5.4 Ethical Considerations

The ethical considerations applicable to utilization of the data gathered are presented by the Swedish Research Council (2002). Primarily, the data analyzed in this study is only used for research purposes and not shared beyond the scope of this study. Confidentiality requirements are met through anonymization of the data and there is no possibility of identification of any of the participants who have partaken in this study. All participants were given information of the experiment and all gave their written consent prior to taking part.

6. Results

6.1 Preliminary Analyses

Participants' BAC levels were measured when first arriving at the laboratory and all registered a BAC of 0.00‰. 15 minutes after consuming their drinks, participants in the alcohol-group were allocated into two groups based on their registered BAC levels; moderately intoxicated (BAC < 0.08, n = 28: men = 17, women = 11; range 0.04 – 0.08; $M = 0.07$, $SD = 0.01$) and highly intoxicated (BAC \geq 0.08, n = 41: men = 17, women = 24; range 0.08 – 0.15; $M = 0.10$, $SD = 0.02$). To counter-act possible gender differences a goodness of fit test ascertained that the gender dispersion was equal between the conditions; $\chi^2(2, n = 135) = 2.76, p = 0.28$. Note also that the terms used to describe the BAC-levels, “moderately-” and “highly intoxicated” are only a comparison between the two and not to be considered an objective measurement.

6.2 Time of Interview: Direct Interview vs. Delayed Interview.

A two-way between groups multiple analysis of variance (MANOVA) was conducted to test the differences in aggression ratings based on BAC-levels (sober, moderate intoxication and high intoxication) and time of interview (direct vs. one-week delay). The mean aggression ratings can be seen in table 1.

No significant interaction effect between BAC-level and time was found, $F(12, 248) = 1.22, p = 0.27$, Wilk's Lambda = 0.89, $\eta^2 = 0.06$. There was no main effect for time of interview, $F(6, 124) = 0.51, p = 0.80$, Wilk's Lambda = 0.98, $\eta^2 = 0.02$ but there was a main effect for BAC-level, $F(6, 124) = 1.89, p < 0.05$, Wilk's Lambda = 0.84, $\eta^2 = 0.08$. Post Hoc analyses revealed that highly intoxicated participants rated the physical aggression displayed by both the man, $F(2, 129) = 4.48, p < 0.05, \eta^2 = 0.07$, and the woman, $F(2, 129) = 6.10, p < 0.01, \eta^2 = 0.09$ in

the film to be lower than what sober participants did. These results are further illustrated in figure 1 and 2.

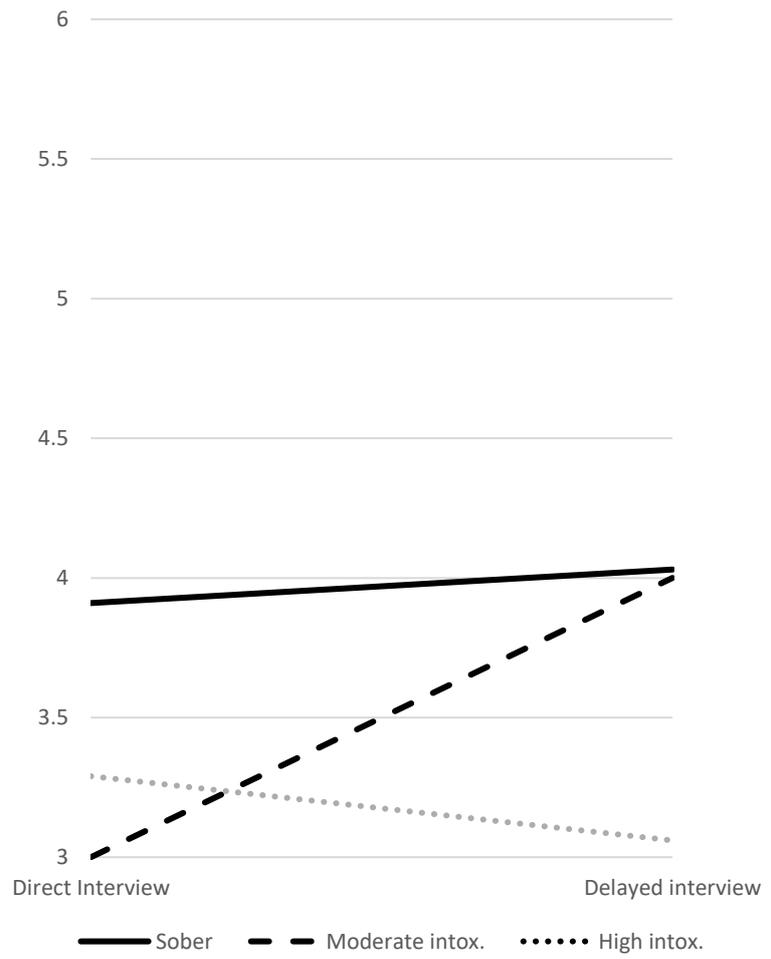
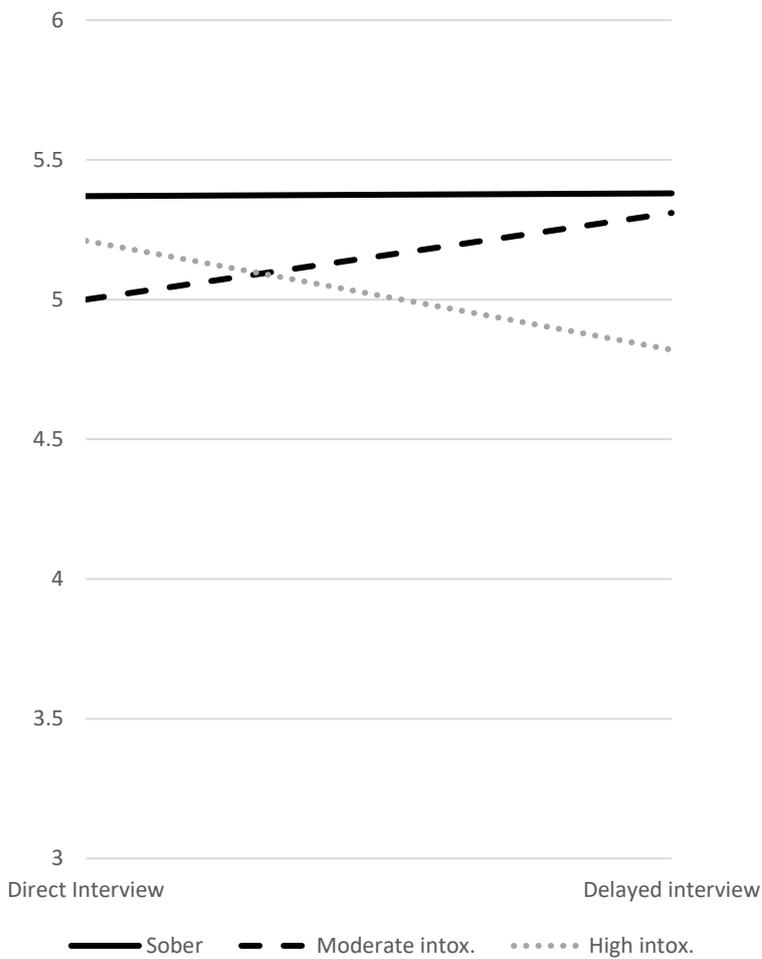


Figure 1. Mean Aggression Scores for the man's physical aggression as a function of BAC and Time of Interview.

Figure 2. Mean Aggression Scores for the woman's physical aggression as a function of BAC and Time of Interview.

Note. The scale ranges from 1 (not at all aggressive) to 6 (extremely aggressive) but in order to illustrate patterns, only a segment of the scale is shown.

Note. The scale ranges from 1 (not at all aggressive) to 6 (extremely aggressive) but in order to illustrate patterns, only a segment of the scale is shown.

Table 1. Mean aggression Scores (and standard deviation) as a function of BAC and Time of Interview.

	Direct interview			Repeated Interview (one week later)			Delayed Interview (one week later)		
	Sober	Moderate intox.	High intox.	Sober	Moderate intox.	High intox.	Sober	Moderate intox.	High intox.
Neutral phase:									
Man	2.06 (0.76)	2.33 (0.65)	2.29 (0.62)	2.06 (0.14)	2.00 (0.21)	2.13 (0.13)	2.21 (0.13)	2.19 (0.19)	2.00 (0.23)
Woman	1.28 (0.46)	1.67 (0.65) ⁺	1.54 (0.59)	1.31 (0.08)	1.25 (0.13)	1.38 (0.13)	1.56 (0.13)	1.63 (0.16)	1.35 (0.12)
Verbally phase:									
Man	3.56 (0.80)	3.50 (0.91)	3.46 (0.93)	3.34 (0.15)	3.33 (0.23)	3.42 (0.15)	3.50 (0.18)	3.56 (0.16)	3.24 (0.32)
Woman	2.44 (0.80)	2.58 (1.08)	2.46 (0.88)	2.28 (0.14)	2.42 (0.23)	2.54 (0.19)	2.62 (0.17)	2.75 (0.21)	2.35 (0.23)
Physical phase									
Man	5.38 (0.61)	5.00 (0.43)	5.21 (0.66)	5.22 (0.13)	5.25 (0.18)	5.38 (0.12)	5.38 (0.11)	5.31 (0.12)	4.82 (0.18) ^{*o}
Woman	3.91 (1.03)	3.00 (1.28) ⁺	3.29 (1.20) [*]	3.44 (0.17)	3.17 (0.41)	3.63 (0.22)	4.03 (0.19)	4.00 (0.34)	3.06 (0.28) ^{*o}

Notes: Mean values reported, SD in parentheses, scale ranged from 1 to 6 (not at all aggressive to extremely aggressive),

* $p < .05$, difference between highly intoxicated and sober witnesses within each interview condition. ⁺ $p < .05$, difference between moderately intoxicated and sober witnesses in each interview condition. ^o $p < .05$, difference between highly intoxicated and moderately intoxicated witnesses.

6.3 Repeated Interviewing: Repeated Interview vs. Delayed Interview.

A two-way between-groups multivariate analysis of variance (MANOVA) was employed to test the difference of perceived aggression between the two interview conditions during the interview one week later (after one week, one group received their second interview and one group received their first interview). The six dependent variables were the perceived aggression of the man and the woman during the three phases of the IPV scenario and the two independent variables were BAC (sober vs. moderately intoxicated vs. highly intoxicated) and group (group 1 [repeated] vs. group 2 [delayed]).

There was no significant interactive effect for BAC and group, $F(12, 248) = 1.14, p = 0.33$, Wilk's Lambda = 0.90, $\eta^2 = 0.05$. Nor were there any significant main effect for either group condition, $F(6, 124) = 1.13, p = 0.35$, Wilk's Lambda = 0.95, $\eta^2 = 0.05$; or for BAC, $F(12, 248) = 0.55, p = 0.88$, Wilk's Lambda = 0.95, $\eta^2 = 0.03$. See table 1 for mean ratings.

6.4 Repeated Interviewing: Change over Time

For the repeated interview condition, a series of mixed between-within-subjects analysis of variance was conducted to test the influence of BAC-levels (between-groups factor; sober vs. moderately intoxicated vs. highly intoxicated) and repetition (within-groups factor; direct interview vs. repeated interview) on each the six dependent variables for the perceived aggression in both the man and the woman in the three phases of the IPV scenario, resulting in six separate repeated measure ANOVAS. See table 1 for mean ratings.

Assessment of the Man; Neutral Phase.

Testing the ratings of the man's demeanor during the neutral phase showed no significant interaction effect, $F(2, 65) = 1.56, p = 0.22$, Wilk's Lambda = 0.95, $\eta^2 = 0.05$. It did show a

significant main effect for time, $F(1, 65) = 4.73, p < 0.05$, Wilk's Lambda = 0.93, $\eta^2 = 0.07$ but not for BAC, $F(2, 65) = 0.37, p = 0.70, \eta^2 = 0.01$. These results are illustrated in figure 3.

Assessment of the Woman; Neutral Phase.

Similar results were found when testing the woman's demeanor. There was no significant interaction effect, $F(2, 65) = 2.82, p = 0.07$, Wilk's Lambda = 0.92, $\eta^2 = 0.08$, but a significant main effect for time, $F(1, 65) = 5.98, p < 0.05$, Wilk's Lambda = 0.92, $\eta^2 = 0.08$. Intoxication levels were not significant, $F(2, 65) = 1.05, p = 0.35, \eta^2 = 0.03$. These results are illustrated in figure 4.

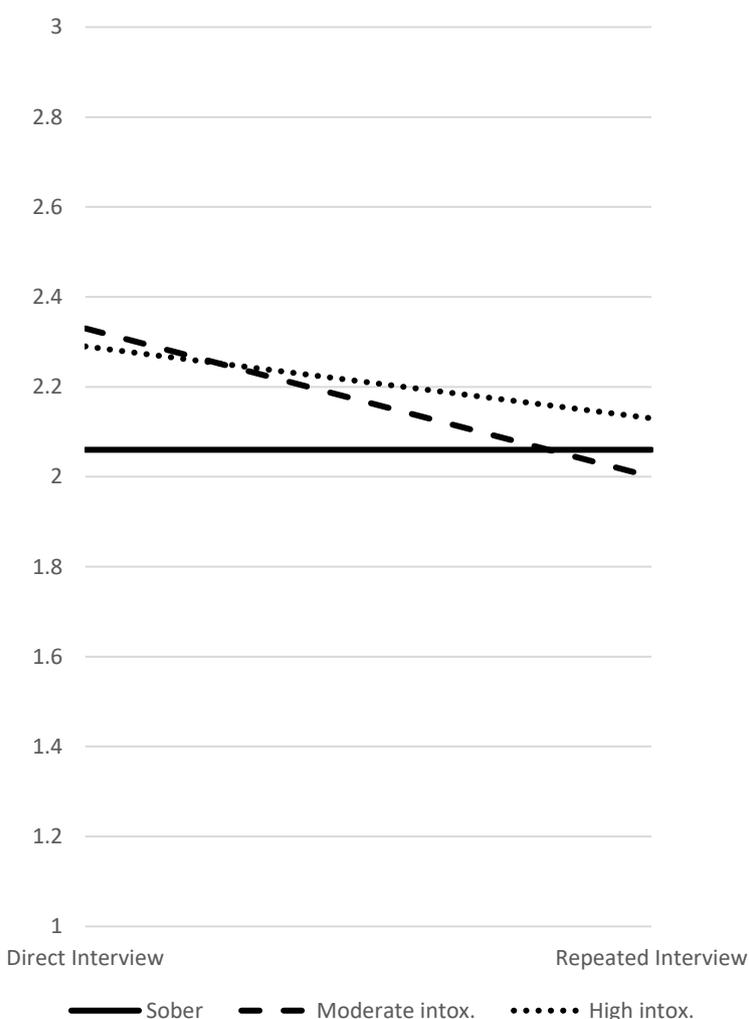


Figure 3. Mean Aggression Scores for the man's neutral demeanor as a function of BAC and Repeated interviewing.

Note. The scale ranges from 1 (not at all aggressive) to 6 (extremely aggressive) but in order to illustrate patterns, only a segment of the scale is shown.

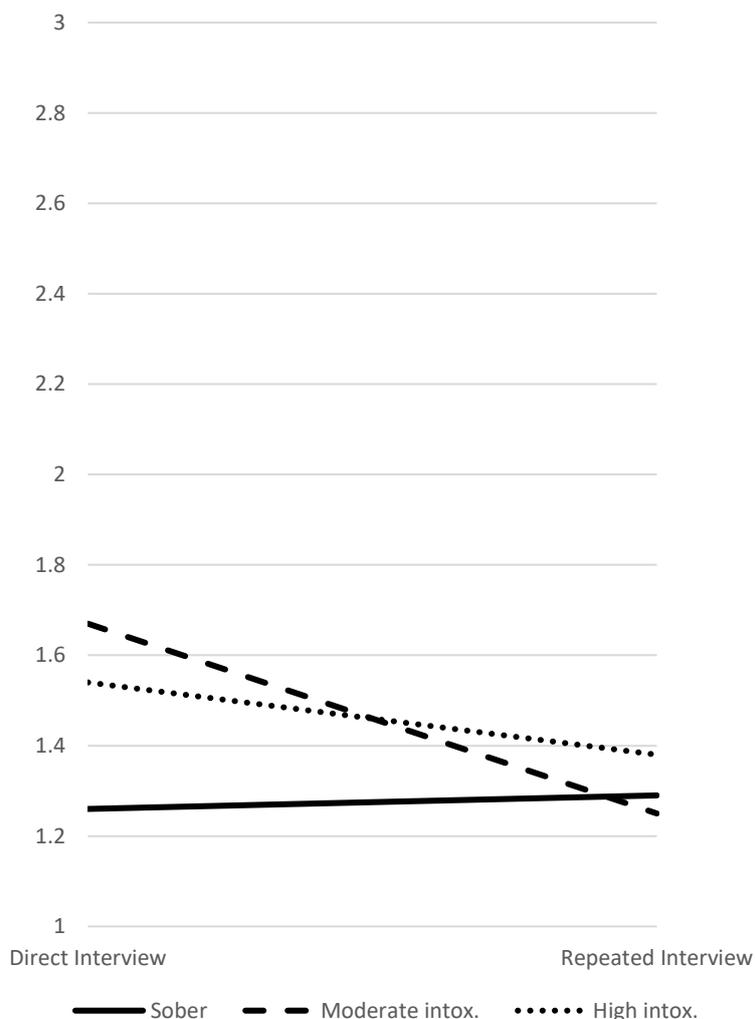


Figure 4. Mean Aggression Scores for the woman's neutral demeanor as a function of BAC and Repeated interviewing.

Note. The scale ranges from 1 (not at all aggressive) to 6 (extremely aggressive) but in order to illustrate patterns, only a segment of the scale is shown.

Assessment of the Man; Verbal phase.

During the verbally aggressive phase of the film, no significant interaction effect was found, $F(2, 65) = 0.25, p = 0.78$, Wilk's Lambda = 0.99, $\eta^2 = 0.01$, nor any main effect for time, $F(1, 65) = 1.35, p = 0.25$, Wilk's Lambda = 0.98, $\eta^2 = 0.02$ or intoxication level, $F(2, 65) = 0.01, p = 0.99, \eta^2 = 0.00$.

Assessment of the Woman; Verbal Phase.

The ratings of the woman's verbal aggression showed no significant interaction effect, $F(2, 65) = 0.68, p = 0.51$, Wilk's Lambda = 0.98, $\eta^2 = 0.02$, nor for time, $F(1, 65) = 0.55, p = 0.46$, Wilk's Lambda = 0.99, $\eta^2 = 0.01$, or BAC, $F(2, 65) = 0.29, p = 0.75, \eta^2 = 0.01$. See figure 5 and 6 for illustrations of the ratings of the verbal aggression.

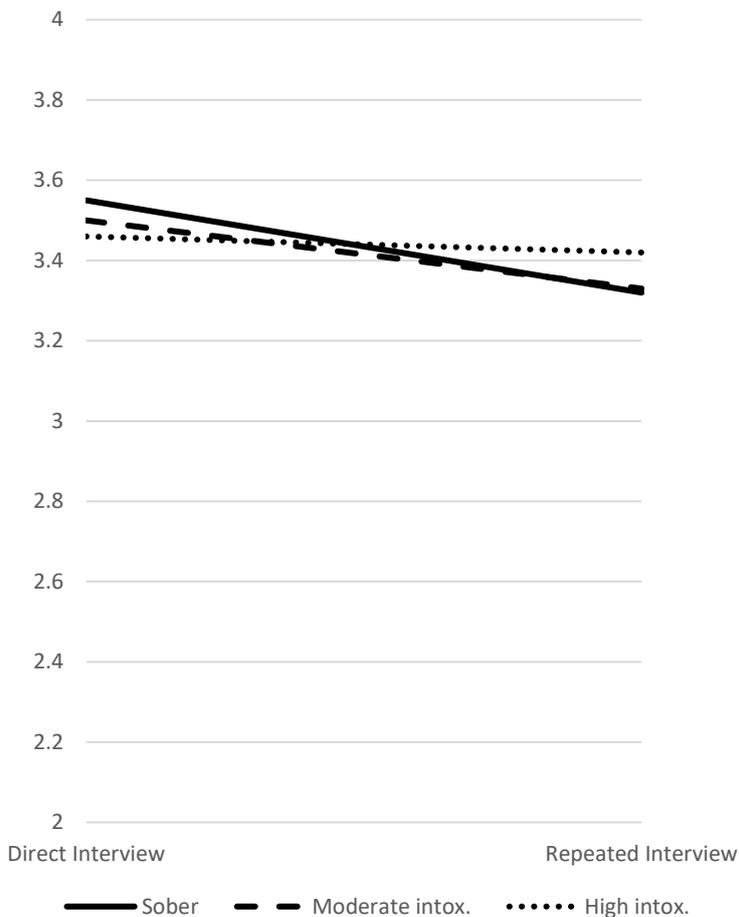


Figure 5. Mean Aggression Scores for the man's verbal aggression as a function of BAC and Repeated interviewing.

Note. The scale ranges from 1 (not at all aggressive) to 6 (extremely aggressive) but in order to illustrate patterns, only a segment of the scale is shown.

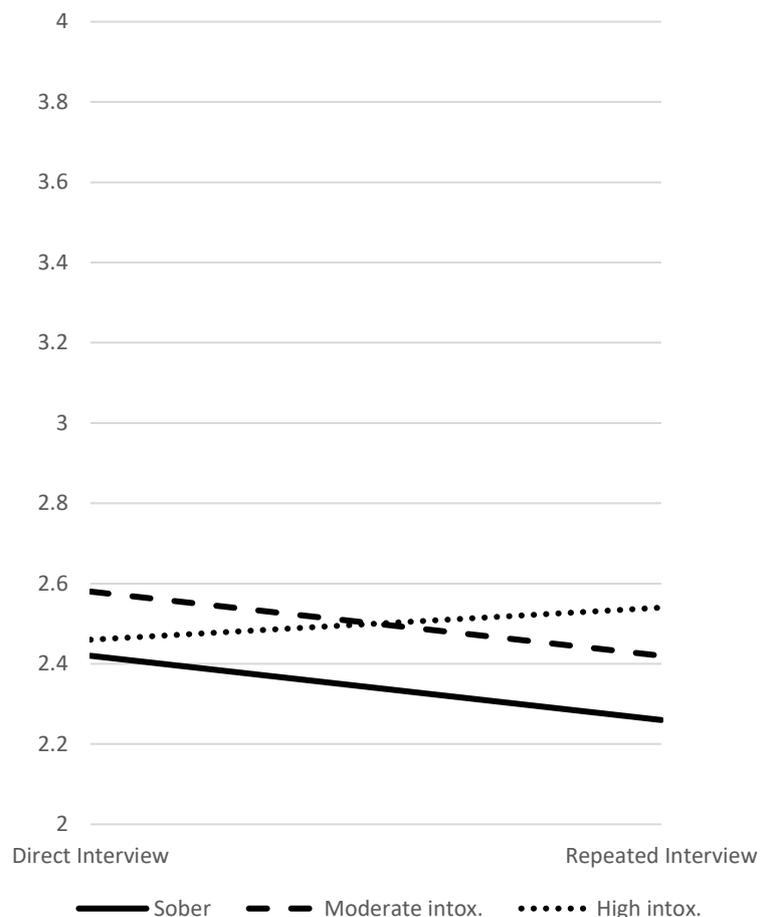


Figure 6. Mean Aggression Scores for the woman's verbal aggression as a function of BAC and Repeated interviewing.

Note. The scale ranges from 1 (not at all aggressive) to 6 (extremely aggressive) but in order to illustrate patterns, only a segment of the scale is shown.

Assessment of the Man; Physical Phase.

For the physical phase, the ratings of the man's aggression showed no significant interaction effect, $F(2, 65) = 2.69, p = 0.08$, Wilk's Lambda = 0.92, $\eta^2 = 0.08$ or for time, $F(1, 65) = 1.10, p = 0.30$, Wilk's Lambda = 0.98, $\eta^2 = 0.02$ or intoxication level, $F(2, 65) = 0.49, p = 0.62, \eta^2 = 0.02$.

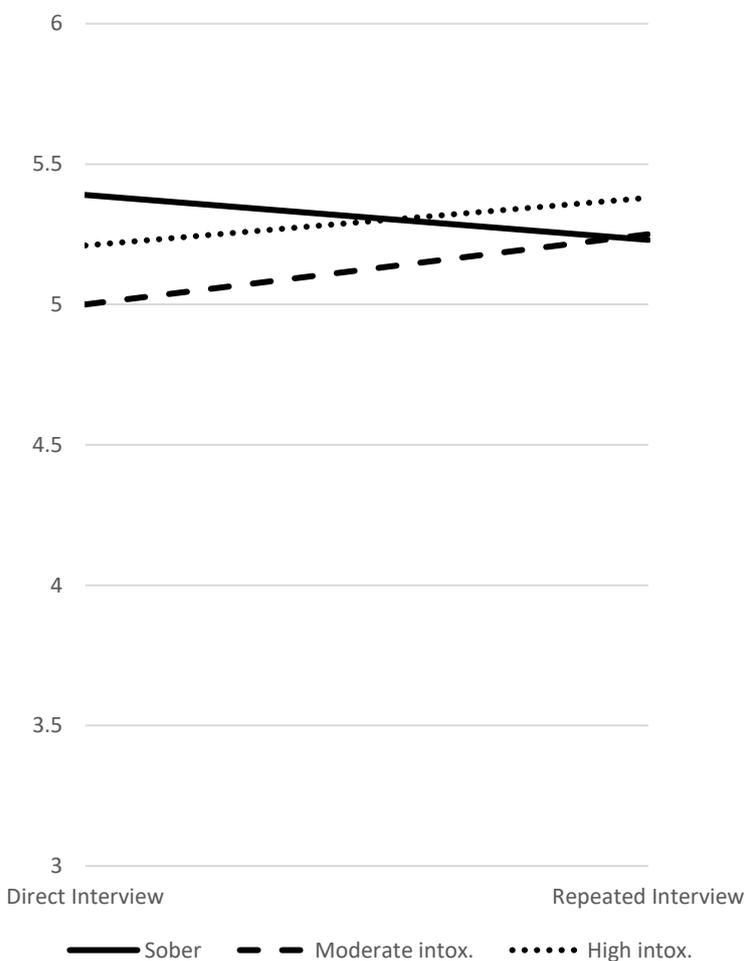


Figure 7. Mean Aggression Scores for the man's physical aggression as a function of BAC and Repeated interviewing.

Note. The scale ranges from 1 (not at all aggressive) to 6 (extremely aggressive) but in order to illustrate patterns, only a segment of the scale is shown.

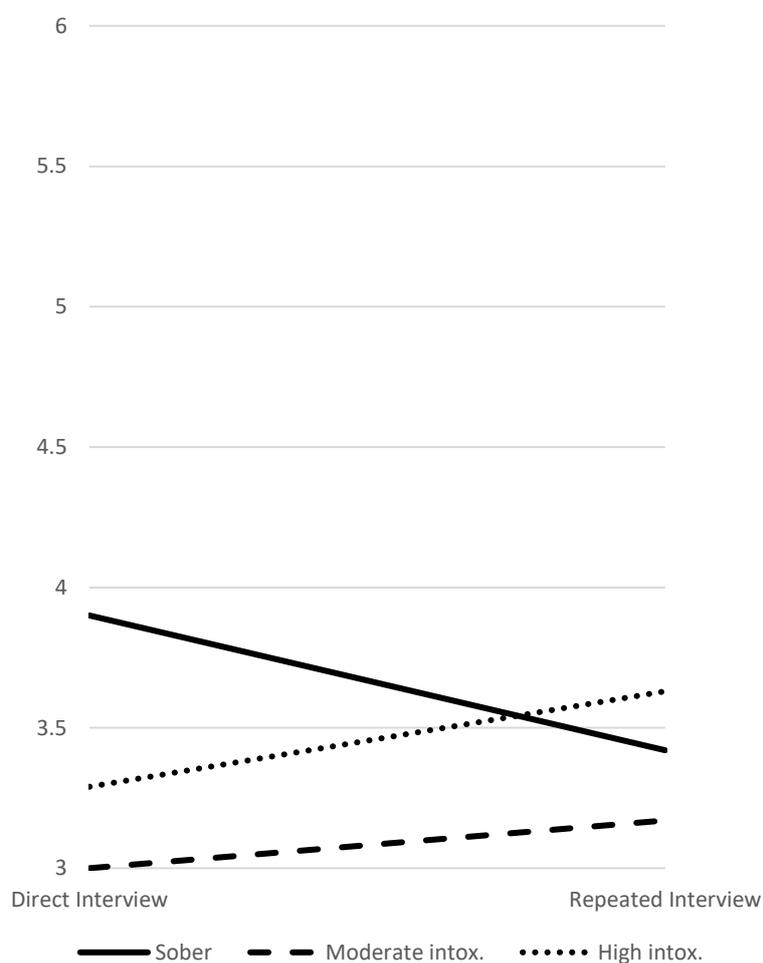


Figure 8. Mean Aggression Scores for the woman's physical aggression as a function of BAC and Repeated interviewing.

Note. The scale ranges from 1 (not at all aggressive) to 6 (extremely aggressive) but in order to illustrate patterns, only a segment of the scale is shown.

Assessment of the Woman; Physical Phase.

Testing the ratings of the woman's physical aggression showed a significant interaction effect, $F(2, 65) = 6.69, p < 0.005$, Wilk's Lambda = 0.83, $\eta^2 = 0.18$. But no significant main effect for time, $F(1, 65) = 0.01, p = 0.93$, Wilk's Lambda = 1.00, $\eta^2 = 0.00$ or BAC, $F(2, 65) = 1.45, p = 0.24, \eta^2 = 0.04$. The results from the physically aggressive phase are illustrated in figure 7 and 8.

7. Discussion

The results showed that alcohol intoxication had no significant, direct effect on how witnesses perceived the anger displayed by the man and the woman in the IPV-film during either of the three interview conditions. This shows no support for Hypothesis 1a and 1b. However, alcohol intoxication did have a significant effect in the comparison between the direct and the delayed interview and contributes with a large portion of the variation in aggression ratings. This does lend support for hypothesis 1a and 1b. Intoxication levels have strong effects on perceived aggression during both the direct and the delayed interview for certain phases of the film (see table 1). However, these effects are not strong enough to reach significance for each interview condition as a whole. While comparing the direct and delayed interview, the effect intoxication has on aggression ratings in each interview group becomes more pronounced and reaches significant levels. While somewhat confounding, these trends follows the findings presented by previous research (Hildebrand Karlén et al., 2017a; Ogle & Miller, 2004) where intoxicated witnesses rated neutral demeanor as more hostile and physical aggression as less so.

Alcohol was found to have a significant effect on aggression ratings depending on the time of interview (direct compared to delayed). That is during a delayed interview, highly intoxicated

participants rated the demeanor displayed by both the man and the woman during the physically aggressive phase of the film as less hostile when compared to sober witnesses. This supports hypothesis 2a. For the participants who were interviewed twice, it was found that during the first interview, they found the neutral demeanor to be more hostile but during their second interview their ratings were almost identical to that of sober participants.

The ratings for the physical aggression changed significantly as sober participants lowered their ratings and intoxicated increased theirs between the first and the second interview. This lends some support to hypothesis 2b while raising the question as to why sober witnesses changed their ratings. It is possible that the affective component to witnessing violent crime also fades with time and the memory of the perceived aggression is lessened alongside it even for sober witnesses. There were no significant differences in aggression ratings between the repeated interview condition and the delayed interview condition. This suggests that the benefits of rehearsal are less important for perceived aggression than for memory consolidation of peripheral details. No support for hypothesis 2c was found.

Alcohol intoxication has been found to influence witnesses' perception of aggression in an IPV scenario (Hildebrand Karlén, 2017a). The findings from this study support this notion by showing similar results and expand on it by also showing that repeated interviewing as well as time of interview affect how these perceptions change. This study highlights the importance of time of interview and repeated interviewing, not only for witness' memory retention but also for a more congruent, reliable assessment of displayed aggression. Previous studies on memory retention for intoxicated witnesses show ambiguous results and one reason for this may be the differences in administered alcohol dose (Schrieber Compo, et al., 2012; Hildebrand Karlén et al., 2015; Yuille & Tollestrup, 1990). This study also aids in understanding the impact that

different BAC-levels have on witness performance and how interview conditions can help counter-act different intoxication-level related alcohol impairments. Below, the findings are discussed more in-depth.

7.1 Alcohol's effect on perceived aggression

There was no significant main effect for alcohol on perception of aggression in either of the three interview formats respectively yet the trends do follow the predictions of the appraisal disruption model (Sayette, 1993). Intoxicated individuals rated the neutral interaction as more hostile and the physical interaction as less so in comparison to sober participants. The appraisal disruption model states that alcohol inhibits the process of interpreting the implications of stress-inducing stimuli by decreasing attentional capacity, limiting the number of associations made for incoming information to previously stored memories and limiting the depth and elaboration made for processed information (Steele & Josephs, 1990; Sayette, 1993; Sayette, 1999). These anxiolytic effects explain how hostile behavior will be interpreted as less threatening to intoxicated individuals. Alcohol also lowers anxiety and inhibition and increases the tendency to utilize, perceive and tolerate aggression in others (Bushman & Cooper, 1990; Ito, et al, 1996). Recent findings on how alcohol intoxication affects witness performance in IPV crime is less than uniform. Together, they suggest a complex influence pattern where alcohol's dualistic effects are moderated by an abundance of individual factors such as gender, BMI, rate of metabolism and alcohol consumption habits (Hildebrand Karlén et al., 2017a; Hildebrand Karlén, 2018, Hagsand et al. 2013; Yuille & Tollestrup, 1990). The results presented in this study vaguely support the notion that intoxication increases perceived hostility in neutral demeanor but lowers it for physical aggression. It is also likely that the effects that level of

intoxication has on perceived aggression would be more clearly delineated with a larger sample size.

7.2 Retention Interval

Let us assume that sober people have the most accurate idea of the displayed aggression (supported by the fact that sober participants ratings are essentially identical regardless of interview condition). During the direct interview, highly intoxicated witnesses deviate the least from the control group (sober) and moderately intoxicated witnesses deviate somewhat more. During the delayed interview however, moderately intoxicated witnesses respond identically to sober while highly intoxicated witnesses gave a substantially lower rating. In other words, moderately intoxicated witnesses (BAC = 0.04-0.08) seem to still be experiencing the arousing, activating and bias-inducing effects of alcohol (Hendler et al., 2013; Sayette, 1993; Tversky & Kahneman, 1973) during the immediate interview which could explain why they rate the aggression as less severe than sober ones. Highly intoxicated witnesses (BAC = 0.08 – 0.15) have surpassed the activating phase of intoxication and are now experiencing the sedating effects of alcohol (Hendler, et al., 2013), which could explain why they differ from the control group to a lesser degree. At this BAC-level, however, they may also be subject to memory consolidation impairment (White & Best, 2000; Zoethut, et al., 2011) and conducting the interview with them after a one-week delay results in a significantly altered aggression rating. In regards to reliable aggression-assessments, if only conducting one interview the optimal time for it depends on the witness' level of intoxication; moderately intoxicated witnesses will suffer no palpable memory retention impairment and will give a more unbiased report after having sobered up while highly intoxicated witnesses are not quite so biased at the time but will

significantly understate the displayed aggression, possibly due to memory impairment, if being interviewed after a week-long delay.

7.3 Benefits of Repetition:

Comparing the aggression ratings for the repeated interview and the delayed interview, no significant effects were found for either interview condition or BAC-levels. This indicates that while rehearsal has been found highly significant for the retention of complete memories in witness paradigms (Hildebrand Karlén et al., 2015; Hildebrand Karlén et al., 2017b; Hagsand et al., 2018) it seems less important for the perception of displayed aggression. This is likely due to hostile behavior being more arousing/relevant and is allocated more attentional resources than less salient stimuli (Mather & Sutherland, 2011). Information competes for our attention and what stands out, either due to goal-relevance or due to arousal is more likely to be encoded into long term memory (ibid.). The emotional salience of aggression is likely to award it more cognitive and attentional resources at the cost of less salient cues being discounted. Therefore, it is not surprising that the aggression ratings did not differ significantly between the repeated and the delayed interview. However, in the comparison between the direct interview and the delayed interview, moderately intoxicated participants differed from sober during the direct interview but not at all during the delayed interview one week later. Highly intoxicated differed somewhat during the direct interview then significantly so during the delayed. In the repeated interview condition both moderate and highly intoxicated participants' ratings deviated at first and then converged with the control group's. Put together, this indicates that when BAC-levels reach above 0.08, it is important to conduct a repeated interview with the witness. If only interviewed after a week-long delay, it seems likely that the memory of the material is

significantly altered due to alcohol's impaired memory consolidation (White, 2003; White & Best, 2000; Zoethut, et al., 2011).

7.4 Changes over Time:

Examining how aggression ratings change from the direct to the subsequent repeated interview after one week yields some interesting results. Participants' assessment of the neutral behavior in the film showed a main effect for time where intoxicated participants rated the behavior as more aggressive than sober during the direct interview but lowered their ratings to converge with the control group after a one-week retention interval. This result both supports previous findings on the hostility bias shown both in and outside of witness context (Hildebrand Karlén, et al., 2017a; Ogle & Miller, 2004) and expands the concept by showing that in a repeated interview format, the anxiolytic judgment impairment acute alcohol intoxication has will dissipate after a week-long retention while memory consolidation will be sufficiently solid as to not alter the memory of central information (Mather & Sutherland, Murphy, Monahan & Miller, 1998; 2011; White, 2003) such as displayed aggression. The aggression shown during the physically aggressive phase of the film are also subject to change for intoxicated participants. During the direct interview, intoxicated participants rated the aggression as less severe than sober. During the repeated interview, intoxicated participants increase their ratings while sober lower theirs. The changes in perception for intoxicated witnesses are in line with the appraisal disruption model (Sayette, 1993) and recent findings on alcohol and repeated interviewing on witnesses (Hagsand et al., 2018; Hildebrand Karlén et al., 2017). The anxiety dampening effects of alcohol make stressful information, such as aggression, appear as less threatening (Sayette, 1993; Steele & Josphehs, 1988). These effects are lost with time and, with

repeated interviews, only peripheral details of the material are lost due to memory decay and alcohol's memory impairment (Hagsand et al., 2018; Hildebrand et al., 2017b).

This interaction effect of time and alcohol had an effect size of $\eta^2 = 0,18$ for the behavior of the woman. While following the same pattern, this effect for the man was less clear ($\eta^2 = 0,08$). The aggression ratings for the man have been higher overall than for the woman (see table 1). These differences as well as the strong, confounding interaction effect on the aggression assessment for the woman's physical aggression could be explained by the dual process theory (Chaiken & Trope, 1999; Khaneman, 2011). According to this, increased cognitive load increases reliance on system 1 processing which utilizes heuristics and biases such as gender stereotypes. Reliance on heuristic processing is also supported by the appraisal disruption model which states that alcohol reduces the depth with which new information is processed (Sayette, 1993) as well as alcohol myopia theory which states that alcohol narrows attentional as well as cognitive capacity as of which a result can be utilization of heuristics and stereotypes (Josephs & Steele, 1990; Steele & Josephs, 1988).

Studies on gender roles in violent crimes found that eyewitnesses perceive a male perpetrator as behaving more gender normative and a female perpetrator as less so when committing the crime (Ahola, 2012; Stewart & Maddren, 1997). The use of violence being gender normative is in line with the man's behavior in this study. While both parties show the same quantity and same severity of aggression, the man is the one who initiates and escalates the aggression and the woman's aggression is defensive. Gender norms paired with selective information seeking and confirmation bias would make the man appear as more hostile/aggressive than the woman. Arousal-biased competition is the notion that arousal determines the priority of attention where either information pertinent to our goal or emotionally stirring information is favored (Mather

& Sutherland, 2011). It is possible that expectancies based on gender stereotypes make the aggression displayed by the man to be perceived as more hostile and the man himself as more of a threat. This explanation is supported by studies showing that emotionally salient or threatening information dominate the attentional allocation hierarchy and make less salient information disregarded (Mather & Sutherland, 2011) and that the perpetrator's gender mediates the attention narrowing effect of threat of violence (Easterbrook, 1959; Pickel, 2009) especially during alcohol intoxication (Ogle & Miller, 2004; Steele & Josephs, 1988). Focused attention on the male, paired with gender related expectancies could explain why the man was thoroughly rated as more aggressive. The limited attentional capacity, loss of focus on peripheral environmental stimuli (Josephs & Steele, 1990; Mather & Sutherland, 2011) and limited depth of elaboration (Sayette, 1993) of new information explains why the woman, out staged by the aggressive man, is seemingly difficult to assess.

8. Conclusion

Many witnesses the police have to work with are intoxicated, particularly when dealing with violent crime such as IPV. Therefore, it is highly pertinent to examine if, to what extent and under what circumstances their testimonies can be relied upon. One key aspect of this problem is the dualistic effects of alcohol – activating and sedating, especially in regards to perception of hostility and aggression. Examining how witnesses' perception of aggression is influenced by alcohol and how this influence can be managed with strategic interviewing is therefore of high value for all legal practitioners.

The purpose of this study was to examine possible effects of alcohol intoxication on witnesses' perceived aggression in an IPV scenario and whether or not these ratings differed based on interview condition.

This study is the first to examine how aggression assessment of intoxicated witnesses to IPV change depending on time of interview. The hypotheses and theoretical assumptions presented here are hence explorative. Humility is warranted when generalizing beyond the context of these findings. The results, nonetheless suggest that an alcohol dose of 0.75g/kg for women and 0.8g/kg for men will alter witnesses' perception of neutral and physical aggression. Time of interview and number of interviews also have bearing on the influence of alcohol on perceived aggression. The reduced attentional capacity and anxiety presented in the appraisal disruption model may explain why intoxicated witnesses perceive neutral behavior as more hostile and physical aggression as less so. Given a week to sober up, this impaired judgment will have reverted to normal for moderately intoxicated participants while highly intoxicated will give a different report due to memory loss.

Repeated interviewing seems to play less of a role in maintaining the memory of perceived aggression than it does for retention of less salient details. However, repetition is still necessary to counter-act alcohol induced memory loss for highly intoxicated witnesses. Based on the results from the present study, it is imperative for law-practitioners to take alcohol intoxication into account when having witnesses describe the displayed aggression in intimate partner violence. Immediate interviewing can be unreliable for moderately intoxicated witnesses but is essential for establishing a reliable witness during subsequent interviewing.

Lastly, it should be mentioned that as this particular field of research is relatively niched, replication of the results presented here along with studies across varied contexts and with different demographics are also needed. Witnessing violent crime, perhaps IPV in particular, can be disturbing and emotionally taxing. The influence this emotional component has on perceived aggression is nigh impossible to capture in laboratory studies and future research

must take this into consideration. Field studies and case studies on authentic reports from intoxicated witnesses to IPV are recommended. That being said, the main argument in this study along with the support found in similar studies is well-founded; intoxicated witnesses are not to be considered as unreliable as previously thought. Impaired judgment and memory consolidation problems due to intoxication levels can be compensated for using proper interview techniques. It is viable to use the findings presented here along with previous research in this field to construct much needed, standardized practice manuals for law practitioners working with intoxicated witnesses.

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