Abstract

Alcohol-related violence surrounding the night time economy puts increased pressure and workload on security and police forces. Research surrounding alcohol-related violence consistently identifies risk factors, such as the organizational practices and physical characteristics of drinking establishments, as influential in the generation of violent behaviour. The current research uses sequence analysis to investigate dynamic patterns of events perceived to lead to a violent incident. The research was collected using questionnaires across university students with customer experience of the modern night-time economy. The findings show perceptions of maladaptive patterns of events that may lead to violent incidents in different environments (a brightly-lit bar and a nightclub). Analysis demonstrated that participants thought those involved in a violent incident would have consumed large amounts of alcohol throughout the night, fuelled by pre-drinking and irresponsible serving practices of staff. Frustration inducing events were also common stages in the sequences leading to a violent outcome. Finally, staff intervention in violent situations was also considered to be an important predictor of violence, with forceful removal of individuals from premises often considered to be the final event preceding a violent incident. The present sequences analysis supports the suggestion that the organizational practices and physical characteristics of a drinking establishment influence the risk of violent activity and helps identify where initiatives aiming to reduce levels of violence could be effectively targeted.

Keywords: Sequence analysis; alcohol; violence; drinking establishments; security staff
A Sequential Analysis of perceptions of alcohol-related violence surrounding drinking establishments.

Drinking culture surrounding pubs, bars, and clubs, collectively referred to as the night-time economy (NTE), has led to increased levels of alcohol-related violence around these venues (Povey & Allen, 2003; Smith & Allen, 2004). Recent Home Office statistics in the UK estimate that one fifth of all violent crimes per year occur in, or within close proximity to drinking establishments, with 80% of these assaults relating to alcohol consumption. Similarly, the British Crime Survey (2002-3) reported that 44% of violent crime victims thought the individual who attacked them to be intoxicated. In addition, recent statistics from the North East Alcohol Office, UK (2013), suggest over a third of police officers are asked during most shifts to provide extra support for the policing of the NTE, which demonstrates a considerable strain placed on the services responsible for dealing with the problem. Alcohol-related violence and incidents surrounding night-time venues is a complex issue. While some public policies and researchers have focused on reducing alcohol consumption (Keatley et al., 2015; Lonsdale, Hardcastle, & Hagger, 2012), fewer studies have looked at the complex interaction of behaviours that precede violent episodes around the NTE.

In an attempt to tackle the ‘binge drinking’ culture in the United Kingdom, the Licensing Act of 2003 introduced flexible opening times for licensed premises, providing management with the option to serve alcohol 24 hours a day. This Act also attempted to minimize public disorder, thought to be instigated by rapid alcohol consumption and mass congregation of intoxicated customers at the 11pm closing time. However, the success of such legislation is largely inconclusive. Whilst small, non-significant decreases in the levels of serious violent crimes have been reported (Hough et al., 2008), a four year study of alcohol-related violent crime in Manchester,
UK found no evidence to support the government-proposed hypothesis that flexible closing times would reduce levels of violent crime (Humphreys & Eisner, 2014). Although the introduction of flexible opening hours demonstrates an attempt to deal with the underlying source of alcohol-related violent crime, evidence suggests it has not had a significantly large impact.

The binge drinking culture present in the United Kingdom has been fuelled by an increase in young people’s drinking behaviour. For instance, binge drinking and drunkenness is a common outcome for individuals socializing within the NTE. Such behaviour is fuelled by the normality of rapid consumption of alcohol prior to entering drinking establishments, referred to as pre-drinking or pre-loading (Caudwell & Hagger, 2015; Caudwell, Mullan, & Hagger, 2016). Previous research has demonstrated that, in comparison to individuals who did not consume alcohol prior to entering licensed premises, pre-drinkers reported higher levels of alcohol consumption during nights-out and were over twice as likely to have had experience of a physical altercation whilst socialising within the NTE during the past year (de Andrade, Homel, Mazerolle, 2016; Graham et al., 2011; Hughes, Anderson, Morleo, & Bellis, 2008; Hughes et al., 2011).

In addition to individual difference variables, research surrounding alcohol-related violence consistently identifies environmental factors (i.e. the physical characteristics and social environment of drinking establishments) as influential in the production or triggering of aggressive behaviour (Quigley, Leonard, & Collins, 2003). Research has also identified numerous characteristics of venues that may lead to violent episodes, such as poor layouts resulting in crowding and inefficient movement systems, dimly lit, and noisy establishments (Green & Plant, 2007; Homel & Clark, 1994; Leonard et al., 2003; MacIntyre & Homel, 1997).
The organizational practices of a drinking establishment are also considered to be triggers of violent activity (Green & Plant, 2007). For instance, the continued service for customers with high levels of intoxication is a strong predictor of aggressive and violent problems within drinking establishments (Stockwell et al. 1993; Homel & Clark, 1994). Also, the type of security staff or bouncers employed by management may intensify delinquent behaviour, or the expectation of misbehaviour (Leather & Lawrence, 1995). With or without intention, security or door staff may initiate violence with customers through the use of perceived unreasonable force and as such escalate violent situations rather than diffusing them (Wells, Graham, & West, 1998).

Therefore, while alcohol may be one cause of violent episodes, it is likely that a complex interaction of many risk factors, such as ineffective staff control and unfavourable establishment characteristics, also trigger violence. A method to investigate the complex progression of risk factors and the chain of events that lead to violent episodes, is therefore needed to provide insight and understanding of the causes of violence in the night-time economy.

**Behaviour sequence analysis (BSA)**

Alcohol-related violence in drinking establishments is a difficult topic to study using an experimental approach (Beale et al., 1998; Fossi, Clarke, & Lawrence, 2005). Behaviour sequence analysis (BSA) applies mathematical models to cause and effect links, in order to further investigate the relationships between events. BSA investigates how events unfold over time and is based on the assumption that identifying the temporal order of events is advantageous for acquiring a more comprehensive understanding of issues like violence. BSA uses methodological eclecticism, applying a quantitative method to qualitative data, therefore providing in-depth knowledge within a scientific framework. As noted by Abbott (1995), sequence...
analysis methods provide researchers with a more effective way of analysing real-world phenomena.

Unlike many data analysis approaches, sequence analysis assumes that events are interdependent, rather than independent of one another (Keatley, 2016; Zourbanos et al., 2015). As suggested by Harré (1977), breaking down social behaviour into isolated events, and as such disregarding the sequential nature and interdependence of social interaction, results in analytic outcomes that do not reflect the true nature of that behaviour. Discovering the order of events leading to a particular outcome allows researchers to anticipate and redirect potentially risky patterns of behaviour. If understood appropriately, the maladaptive pattern of events, which result in violent incidents in drinking establishments, can be interrupted by initiatives introduced to steer sequences towards safer, less costly outcomes.

To conduct behaviour sequence analysis, Clarke and Crossland (1985) identify and describe three main stages. First, unitization, refers to the division of behaviours/actions into distinct units. Second, events are classified into groups based on levels of similarity and functional relatedness. Finally, during analysis, transitional matrices are used to establish the frequency with which one event succeeds another. If the probability of one event following the other is above the level of statistical chance, then the events are considered to show a sequential pattern. Significant transitions between two events may then be visually represented in state transition diagrams.

Sequence analysis has previously been used to investigate the most common pathways resulting in violent incidents in drinking establishments (Beale et al., 1998; Levine, Best, & Taylor, 2007; Taylor et al., 2008). Findings across studies indicate several significant transitions preceding violent behaviour, including following directly from the initiating problem, once staff members had intervened, or once individuals involved in the aggressive situation have exited the premises. Whilst Beale and
colleagues’ study retains ecological validity via the analysis of real-world reported incidents, the incidents were reported from the perspective of drinking establishment management and employees. Thus far, no research has utilized sequence analysis to investigate the patterns of behaviours from the perspective of a customer.

**Present study**

The aim of the present study was to use sequence analysis to investigate participants’ perceptions of the patterns of behaviour resulting in violence within licensed premises. Based on previous research (see Beale et al., 1998) it was hypothesised that participants with experience of the NTE may have a more in-depth understanding of the processes leading to violent incidents and as such reveal how and where strategies aiming to reduce violent incidents could be effectively targeted. In order to investigate contextual differences in the progression and sequence of violent episodes, the current study focused on two different types of night-time venues. The first (Condition A) was based in a brightly-lit, aesthetically pleasing drinking establishment with a large seating area. The second (Condition B) was based in a dimly-lit drinking establishment with limited seating availability and would be commonly referred to as a ‘nightclub’. These venues were selected to give a general contrast between two popular night time venues. The main aim being to see whether similar patterns emerged, and how this may be used to reduce violence in these venues.

**Method**

**Participants**

A convenience sample of participants was collected via email and by hand. In the first instance, participants were contacted via an online sign-up participation system; however, researchers also collected questionnaires by handing them out to people. Target participants were individuals over 18 years old in Nottingham, UK,
with customer experience of the modern night-time economy, and therefore the sample
mostly consisted of undergraduate students. Participants were brief that the study
would ask them about perceptions of violent incidents in a night time venue
(depending on the condition they were in); therefore, to participate, they should have
previous experience of being out at night in that particular venue. The returned
questionnaires consisted of an almost equal number of Condition A (N = 78, 56
females, 22 males, $M_{age} = 20.33$, SD = 1.08, range = 18-25 years) and Condition B (N
= 75, 45 females, 30 males, $M_{age} = 19.88$, SD = 1.61, range = 18-25). Unfortunately,
ethnic and social economic status of participants was lost; however, all participants
were Undergraduate students, from a broadly white-British background, and middle-
SES. No financial incentive was offered to individuals for their participation. Ethical
Approval was gained from the University of [REMOVED FOR ANONYMOUS
REVIEW].

Sequence List development

Based on previous research (e.g., Beale et al., 1998) and discussion with
individuals with experience of the modern night-time economy, a list of 47 events was
produced as a starting point on which participants could develop and describe their
sequences (See supplementary material 1). This list included typical events and
behaviours previously highlighted in the literature. This method of eliciting sequences
of behaviours has been supported in the literature (Townsend et al., 2016). The events
were placed in a random order to avoid influencing the sequences provided by
participants.

Materials

Participants received a questionnaire booklet, relating to either condition A or
B. The booklets were comprised of an information sheet, consent form, picture sheet,
task sheets and debrief sheet. The only difference between the two questionnaires was
the picture sheet, which instructed participants to study an image of either Condition A
(the brightly-lit bar) or Condition B (the nightclub). The pictures and description of the
two conditions were assessed by twenty randomly selected participants. The results of
the manipulation check confirmed the main differences between the establishments
chosen to feature in the questionnaire were maintenance, ease of movement, and
visibility\(^1\).

**Procedure**

Participants were sent emails with the questionnaire booklet attached, or were
given the questionnaire by hand. The booklet first informed participants about the
content of the study, indicating that they should have experience of the night-time
economy. Participants then gave full consent to participate. Participants were given
either Condition A or Condition B questionnaires. First, participants in both conditions
read the same short description of a violent incident occurring between two
individuals. This description was based on a real life violent incident, reported by the
Daily Mail (Sharp, 2013), which occurred between a male security staff member and a
male customer outside a drinking establishment in Newcastle (a large city in the North
of England, UK). Participants were then asked to study the image of the venue in their
questionnaire and told that the scenario they had read occurred in that venue.

Participants were then asked to use their own experience and knowledge to
chronologically order a series of events that they believed to precede the violent
outcome. Participants read a list of 47 possible behaviours and were asked to select
which behaviours they thought would occur. Participants were then asked, of the
behaviours they selected, and any others they thought might occur, to put them in

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\(^1\) Results for manipulation check available from correspondence author, on request.
sequential order. Participants could put the same behaviour in multiple times, or just once. Participants were informed to use as many or as few behaviours as they thought necessary to give a full description of the timeline of events.

Results

Data Collation

Participants’ data were coded into strings of sequences, and input into a behaviour sequence analysis program in SPSS. Separate sequence chains were produced by individuals who were in condition A or B. This allowed separate analyses to be conducted between the two night time venues and differences between contexts to be investigated.

Frequency Analysis

The first stage of behaviour sequence analysis is to understand the individual frequencies of particular behaviours or events (see Table 1). Table 1 shows the frequencies of individual events for Condition A (well-lit, open bar) and Condition B (dimly-lit, crowded nightclub). Results indicated that the majority of participants selected ‘Enter the establishment’, ‘pre-drinking’ and ‘purchasing multiple drinks at once’ were the most frequently occurring individual behaviours.

Sequence Analysis

Sequence analysis was then conducted to show the progression of events that participants perceived to result in a violent outcome. Using SPSS, transitional frequency matrices were produced for each condition to establish whether one event (the sequitur) was preceded by another event (the antecedent), at a level higher than expected by chance alone. However, as 47 events would result in a lag-one transition table containing 2,209 cells, the number of events was reduced to allow for effective analysis and understanding of the data. The 16 events with the highest frequency
were selected as independent events, whilst the remaining events were allocated to
three event groupings in order of decreasing frequency; Moderately-High Frequency,
Medium Frequency, and Low Frequency groupings. As a result, 19 events remained
for the sequence analysis (the 16 individual high frequency ones, and the 3
groupings). This is a standard practice in sequence analysis to reduce complexity of
the data and diagrams (see Townsend et al., 2016)².

Chi-squared tests were performed to determine whether a sequential pattern
existed in each of the conditions. The chi-square value was significant for both
conditions, indicating that transitions in the data had a sequential relationship at a
level greater than expected by chance. For Establishment A, $\chi^2(324) = 2612.26$, $p < .001$, for Establishment B, $\chi^2(324) = 2897.85$, $p < .001$.

To establish the transition between behaviours, the standardised residuals for
each possible event pair were calculated. This was performed individually for each
condition (see Figure 1 for Condition A, and Figure 2 for Condition B). Although
Colgan and Smith’s (1978) guidelines advocated 1.008 as a set threshold to identify
significant transitions between events, a more stringent critical value of standardised
residuals greater than 2 was used, which is closer to more recent guidelines (Klonek, Quera, & Kauffeld, 2015). This ensured that the subsequent state transitions
diagrams, which were produced to visually illustrate the patterns of events in the
sequences, were not too complex to follow and showed only the most common
transitions.

**State Transition Diagram**

The state transition diagram shows links between pairs of behaviours (e.g.,
A→B; B→C; C→D). The diagram may give the impression that you can, therefore,

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² Full transition matrices for all behaviours are available from the corresponding author, on request.
read sequences as $A \rightarrow B \rightarrow C$; however, this is not the case\(^3\). The diagrams should be read in single-step increments. For instance, sequences in both conditions began with pre-drinking; from this antecedent people in condition A thought that either *queueing* or *enter drinking establishment* would follow. However, participants in condition B thought that only *queueing* would follow.

The first thing to note is that sequences were very similar for both conditions. By following the state transition diagrams, participants’ perceptions of the progression between behaviours can be seen. Sequences show that immediately after entering the premises, participants thought that those involved in the violent situation would be likely to participate in a chain of *purchasing and consuming multiple alcoholic beverages*, often of the caffeinated-alcoholic variety. In both figures 1 and 2, condition A and B respectively, dancing occurred early in the sequences and was perceived to be followed by the protagonist *behaving disruptively and feels hot or frustrated*. In condition A (figure 1), having *drink spilt on clothes* was related to several other behaviours, including feelings of frustration, subjected to verbal abuse, and being threatened.

The sequences provided by participants showed significant transition from *Accidentally pushed/shoved* and *Behaving disruptively* and *Others becoming involved in potentially violent situation*. This suggests that participants thought the addition of more people, attempting to either participate or intervene in the aggressive situation, might cause the situation to escalate. Correspondingly, the events with the highest frequency within the Medium and Low Frequency groups that immediately precede the violent incident were *Supported by friends/partner/stranger in argument*, *Group*

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\(^3\) These *higher-order* analyses are possible; however, they are very data consuming and the lag-one analysis provides a clear progression of behaviours. Original data sets are available from the corresponding author, if anyone wishes to conduct higher-order analysis.
Rivalry’ and ‘Becomes involved in pre-existing fight (see supplementary material 2).

Intervention Fails also had the highest frequency within the medium frequency event
group, suggesting participants may have perceived the involvement of others, such as
staff members or friends, as ineffective. Finally, in both conditions, Forceful removal
from premises by security staff was considered an event that preceded the violent
incident.

Discussion

The aim of the present research was to use behaviour sequence analysis to
understand participants’ perceptions of the progression of events and behaviours that
lead to violence in and around different night-time economy venues. In particular, a
well-lit bar and a dimly-lit, crowded club were chosen as venues, and different groups
of participants were asked to provide an account of the most likely sequence of events
from leaving home to a violent incident occurring later that night. This research
provides general support for a number of previous studies in the area (Beale et al.,
1998; Levine et al., 2007; Taylor et al., 2008). In particular, the current research
complements Beale and colleagues’ findings, which investigated a similar topic, but
from the perspective of management and venue owners. The current research indicates
that it is not necessarily just intervention by staff that leads to violence, but several
different antecedent behaviours.

The analysis of the sequences provided by participants offers a new method
for mapping their perceptions of sequences that may lead to violence in and around
the night time economy. Firstly, the sequences show that pre-drinking alcohol before
setting-out to go to a venue was frequently perceived to be an antecedent behaviour
leading to eventual violence. This supports research that shows pre-drinking is an
increasing concern, especially among University students (Caudwell & Hagger, 2015;
Caudwell et al., 2016). To tackle the combined effects of pre-drinking and venue
drinking, the potentially irresponsible sale of alcohol could be discouraged by prohibiting the purchase of multiple alcoholic drinks in one transaction, or reducing the length of ‘happy hours’, whilst also limiting the sale of discounted and caffeinated-alcoholic drinks, which have been linked to increased violence (Kuhns, Clodfelter & Bersot, 2010).

To help tackle inebriation and violence, staff members could be provided with training in how to effectively refuse service to intoxicated customers and offer non-alcohol alternatives. Certain countries have introduced programmes aiming to promote the responsible service of alcohol, with reasonable success (e.g., the Responsible Beverage Service Program in Canada). Although such interventions are likely to have a positive effect on reducing levels of alcohol-related violence in other countries, as of yet, the implementation of such initiatives is not common practice.

A comparative assessment of condition A and B sequences revealed that there were an increased number of perceived transitions between alcohol purchase/consumption and frustration inducing events and disruptive behaviour in condition A. It may be that these transitions did not feature as much in condition B sequences as such behaviour is more expected and tolerated in enclosed, crowded layouts typical of night-clubs. Therefore, initiatives to improve the design of licensed premises, such as one-way pedestrian movement systems or lowering maximum capacity of establishments, may be effective in reducing the risk for violent activity within an establishment.

The current findings indicated that the forceful removal of individuals from licensed premises was often perceived as a final trigger before a violent incident. This finding supports previous research that showed how staff intervention can have a negative impact during conflict situations (Beale et al., 1998). Since publication of Beale and colleagues’ research, UK legislation has introduced the requirement for
security staff to hold a license from the Security Industry Authority, obtained by completing training in a range of areas, including health and safety at work, physical intervention, and conflict management. Effectiveness of current training may still be ineffective as recent customers of the modern night-time economy still view staff intervention as a risk factor for violent behaviour. Although UK security staff have the right to respond with equal force when necessary, responsibility to customers and customer care should be paramount.

The analysis of results shows the perceived sequences of events leading to a violent incident based on the responses provided by a sample of both male and female students; however, the generalizability of this student sample to other populations is questionable. It is likely that the sequences produced by non-student populations or of those above 25 years of age may be different. Similarly, the majority of respondents were mainly white British male participants and it is acknowledged that the triggers for violent behaviour and effects of alcohol consumption may be different for other ethnic and cultural groups and between males and females.

In addition, the violent scenario that participants were required to read was male orientated. As a result, the sequences produced by participants may represent the events which they thought would lead to a violent incident between two males. Although it is likely that a large proportion of violent incidents surrounding the NTE are male-orientated, a rise in the number of females participating in binge drinks and anti-social behaviour may highlight the need for future research to investigate the causes of female-female violent incidents.

Conclusions

The general conclusion to be drawn from this research is that, from the perspective of a customer, there is often a series of interdependent events perceived to
precede violent incidents that occur in, or within close proximity to drinking establishments. Applying the method of sequences analysis has allowed the integration of every day experiences and scientific study, which is vital for issues with real world applications, such as alcohol-related violent crime. The technique has allowed insight into how risk factors surrounding the night-time economy cumulate and highlights where appropriate measures could be implemented, such as queuing and staff removal strategies. Intoxication alone is not a clear predictor of violence, yet the combination of drunkenness and risk factors internal to the licensed premises may result in an increased propensity for violent behaviour in certain individuals.
References


Trent University.


