Published in final edited form as:

Drug Alcohol Rev. 2012 June ; 31(4): 377–384. doi:10.1111/j.1465-3362.2011.00377.x.

“Hotspots” for Aggression in Licensed Drinking Venues

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Abstract

Introduction and Aims—In order to better understand the social context of barroom aggression, the aim was to identify common locations (“hotspots”) for aggression in bars and examine the association of hotspots with aggression severity and environmental characteristics.

Design and Methods—Aggression hotspots were identified using narrative descriptions and data recorded on premises’ floor plans for 1057 incidents of aggression collected in the *Safer Bars* evaluation. Hierarchical Linear Modeling was used to identify bar-level and night-level characteristics associated with each hotspot.

Results—The most common location for aggression was the dance floor (20.0% of incidents) or near the dance floor (11.5%), followed by near the serving bar (15.7%), at tables (13.1%), aisles, hallways and other areas of movement (6.2%), entrance (4.5%) and the pool playing area (4.1%). Hotspots were predicted mainly by bar-level characteristics, with dance floor aggression associated with crowded bars, a high proportion of female and young patrons, lots of sexual activity, a large number of patrons and staff, security staff present, better monitoring and coordination by staff, and people hanging around at closing. Incidents at tables and pool tables tended to occur in bars with the opposite characteristics. Nightly variations in patron intoxication and rowdiness were associated with aggression at tables while variations in crowding and sexual activity were associated with aggression in areas of movement. Incidents outside tended to be more severe.

Discussion and Conclusions—Each aggression location and their associated environments have somewhat different implications for staff training, premises design, policy and prevention.

Keywords

alcohol & violence; licensed premises; environment; prevention

Introduction

Licensed drinking venues are common settings for aggression [1–8] and injury [9–11], and previous research has demonstrated important associations between environmental factors and frequency of aggression in licensed premises [see review by 12]. For example, aggression has been associated with venues that have: dancing [13–15]; pool tables [13–15]; other games [16, 17]; inconvenient serving bar access [18]; drink service refusal [17, 19]; entrance queues [15]; and lots of patron movement [13], especially intersecting traffic patterns [20]. Although these associations suggest that specific locations or “hotspots” may be high risk for aggression, these studies examined only the association of aggression with the presence of certain characteristics (e.g., dancing taking place, pool tables in use, or poor serving practices) not whether aggression actually occurred in specific locations such as the dance floor or was actually related to specific activities (e.g., dancing, pool playing, drink service).

Identifying aggression hotspots has both theoretical and practical significance. For example, if pool tables are hotspots for aggression, this suggests a focus on specific theoretical constructs such as provocation (e.g., being bumped by passers-by), competition, concerns with self image and frustration [21]. High risks at pool tables also suggests practical strategies to reduce risk such preventing traffic flow near the tables, establishing rules for access to and competition at the pool tables, ensuring closer staff supervision and even eliminating pool tables completely. Thus, the identification of aggression hotspots can help target prevention strategies as has been done using similar data related to crime [22–25], policing [26], schools [27] and prisons [28].

It is also important to identify locations where more severe aggression occurs, not just more frequent aggression, because severe aggression, even if fairly rare, needs to be a primary focus for prevention. For example, an important finding for preventing prison violence is that aggression is more likely in crowded areas but more severe in isolated areas [29]. Hotspots may also vary by environmental characteristics of the venue. For example, aggression at the serving bar may be more likely on crowded nights because of queues and bumping related to drink purchase, while aggression at pool tables may be more affected by patron intoxication than by crowding.

Objectives

The objectives of the present research are to identify: (1) the most frequent locations for aggression and severe forms of aggression in late night large capacity venues; and (2) characteristics of the immediate environment and of the venue generally associated with hotspots.

Methods

Procedures

During 2000 – 2002, 1334 visits were conducted by trained male-female pairs of observers to 118 large capacity (>300 patrons) bars/clubs in Toronto, Canada, between midnight and

3:00 A.M. on Friday and Saturday nights as part of the evaluation of the *Safer Bars* program (30). Qualitative and quantitative data were recorded for 1057 incidents of aggression observed anywhere in the venue, in the queue to enter, or outside after closing. These involved 2700 patrons and 806 staff [see 15, 30, 31 for more details].

Measures

Incident location—The observers recorded incident locations and indicated any areas that were crowded in narrative descriptions of the incidents and on floor plans of the venue. If people involved in the incident were in different locations (e.g., patron at tables yelling at someone at the entrance), the location of the aggressor (i.e., patron yelling) was used. The initial location was used if an incident moved to other location(s). Locations included: on the dance floor; near the dance floor; among tables; at or near the serving bar; areas of movement (aisles, stairways or hallways, etc.); entrance including in the queue to enter; pool tables if in use (otherwise coded as tables); coat check; exit; in the washroom; all other inside locations (e.g., open areas); outside the bar; and initial location unknown.

Aggression severity—In previous analyses of these data, five types of aggression were defined based on harms caused by the act [31], including: 1. minor nonphysical – minimal harm such as that experienced from mild expressions of anger; 2. minor physical – minimal harm from physical acts such as light pushing; 3. moderate-severe nonphysical – acts causing psychological or emotional discomfort such as yelling, screaming or threatening; 4. moderate physical – acts causing discomfort but not pain such as forceful pushing, shoving, grabbing; 5. severe physical – acts causing pain such as punching, kicking. Incidents were categorized by the highest level of harm by anyone in the incident. An overall severity score was calculated based on level of intent (1. defensive only, 2. probably non-defensive intent, 3. definite intent) and combinations of physical and nonphysical aggression [described in 32]. The scale ranged from 0 (no harm, no intent), 1 (minor nonphysical, defensive intent) to 21 (severe physical harm, definite intent) (Pearson r for inter-rater agreement = .85). Incident severity rating was the maximum score for anyone involved.

Environmental variables—Environmental characteristics were rated following every night's observation with composite scores constructed by averaging the observers' independent ratings (see Table 1). Most variables showed high inter-observer agreement at both the night and bar levels; however, results for variables with lower than desirable inter-rater reliability (e.g., night-level measures of staff coordination and monitoring) should be interpreted with caution.

Analyses

Frequencies and percentages were computed showing the most frequent locations for aggression. Differences in mean severity scores by location were assessed using Analysis of Variance with the Scheffé test for pairwise comparisons. Three-level (incident, night, bar) Hierarchical Linear Modelling (HLM) Bernoulli models [33] were estimated to assess the relationship between each environmental variable and each incident location (vs. all other locations). Bivariate rather than multivariate approaches were used to focus on environmental characteristics associated with each location rather than the predictive power of specific environmental characteristics controlling for other variables. The environment variable in each model was grand mean centred at the night and bar level. All analyses included random intercepts to allow for unexplained mean bar-level differences. Slopes of night-level variables did not include a random residual component (i.e., the variance in slopes was modelled as being fixed) because no chi-square p -values for the variance components for these slopes were greater than 0.05. Presence of pool tables and security staff were modelled with only a night-level measure because they lacked sufficient night-

level variance to meaningfully separate night and bar-level relationships to the outcome (i.e., within-bar variance of less than 20% of the total variance). Incidents on the dance floor and near the dance floor were combined for the HLM analyses because they had similar relationships with environmental variables.

Ethics

This research was approved by the Research Ethics Board of the Centre for Addiction and Mental Health.

Results

As shown in Table 2, excluding unknown original location and the combined category of other inside locations, the most frequent locations for aggression were: dance floor, serving bar, tables, movement areas, entrance and pool tables. The fourth column shows the percent of incidents in each location that occurred when the location was crowded. High crowding was most likely for dance floor, serving bar and coat check incidents and least likely for incidents at tables and pool tables and in areas of movement. Highest severity scores and the largest percent in the moderate-severe physical harm category were for staff ejecting patrons and patron conflict where the initial location was unknown and outside the venue. The only significant differences for severity were for staff ejecting patrons initial location unknown (more severe than incidents at serving bar, tables and other locations).

The HLM analyses shown in Table 3 suggest that location was mainly associated with bar-level characteristics with few significant associations at the night level. Aggression *on or near the dance floor* was more likely than aggression in other locations to occur in venues with: queues to enter; presence of security staff; greater numbers of patrons and staff; larger proportions of female and young patrons; more movement/crowding/noise; more sexual activity/competition; better coordination, monitoring and professional boundaries by staff; and larger numbers hanging around at closing. Within bars, dance floor aggression was more likely on nights with poorer ventilation and less likely when there was a queue to enter.

Three variables were significantly associated with aggression *at the serving bar*, namely: venues with poorly coordinated staff and nights with lower proportions of female and young patrons.

Aggression *at tables* and *at pool tables* occurred in generally similar venues, namely those with: no queue to enter, no dancing, no security staff, fewer patrons and staff, a lower proportion of female and young patrons, less movement/crowding/noise, less sexual activity, better ventilation, cleaner premises, less coordinated or professional staff, and fewer people hanging around at closing. However differences were found between tables versus pool table locations, with pool table aggression occurring in venues that had lower levels of intoxication and rowdiness/permisiveness, while table aggression was more likely on nights where patrons were more intoxicated and there was greater rowdiness/permisiveness. In addition, aggression at pool tables was more likely on nights with better scores on professional boundaries.

Aggression in *areas of movement* was mainly associated with night-level variations in the environment, namely, a queue to enter, more movement/crowding/noise and more sexual activity/competition, but also with venues that tended to have more people hanging around at closing. Aggression *at the entrance* was associated with venues where there was dancing, security staff and no pool playing and nights when there was a queue ($p = .059$).

Discussion

Aggression hotspots in late-night large capacity bars and clubs in Toronto, Canada, circa 2000 – 2002 generally reflect associations found in previous research suggesting the importance of the dance floor [13–15, 19] including traffic to and from the dance floor [19, 20], the serving bar [17, 19] and associated traffic [20], areas of movement [13, 20], the entrance [see 12] and pool tables [13, 14]. Although no data are available regarding the number of people in each location, the most frequent locations for aggression (dance floor and serving bar) were also the most crowded suggesting that high incidence may be partly associated with greater numbers in the area.

The analyses indicated that hotspots tended to be associated with bar-level rather than night-level variations in the environment with two distinct risk environments identified: (1) dance floor aggression at popular crowded dance clubs [34] frequented by younger and a larger proportion of female patrons and (2) aggression in table and pool table areas in less crowded bars/pubs/taverns with larger proportions of older and male patrons. Thus preventive strategies need to be tailored to reflect these two very different environments as well as the specific locations where aggression occurred.

The high rate of dance floor-related aggression suggests that the need to improve the design and supervision of dance floors. In addition, given the high rate of sexual aggression associated with dancing [35], staff may also need to be more proactive in preventing and addressing sexual aggression.

Aggression at tables occurred in venues where serving staff had poor professional boundaries and on nights where patrons were more rowdy and intoxicated, suggesting that aggression at tables tends to occur where there is greater familiarity between patrons and staff and where staff are more permissive and more likely to serve intoxicated patrons. Thus, table aggression might be reduced by improving staff training and venue management.

Although only about 4% of incidents occurred at pool tables, this number is noteworthy given that about 70% of venues had pool tables and only a small proportion of patrons were in the pool table areas. Thus, the relatively high rate suggests some role of the activity itself, such as provocation and competition associated with pool playing. Aggression at pool tables occurred in less crowded venues where there was poor staff coordination and monitoring. Therefore, prevention could include better monitoring and management of pool playing and the premises generally. The significant *night-level* association of pool table aggression with *better* professional boundaries suggests that occasional tightening of professional boundaries in loosely run establishments may actually backfire (i.e., effectiveness of professional boundaries depends on consistency).

Areas designed for movement (e.g., hallways, aisles) were among the most frequent locations for aggression, despite not being generally crowded. Moreover, the importance of movement is likely under-estimated because some of the aggression classified as near the dance floor or serving bar would have been related to movement. The general association of movement and crowding with aggression has been known for over 30 years [13]; however, the substantial proportion of aggression in this location and the night-level associations with movement/crowding/noise level indicate a specific role of traffic flow in precipitating aggression [20]. Thus, greater attention needs to be paid to the layout and design as well as measures to reduce the amount of movement in the venue, especially in stairways where there is higher risk of injury (21 incidents occurred in stairways). The night-level association with sexual activity and competition also highlights the need for greater vigilance in areas of movement where aggressive sexual overtures may be disguised as accidental bumping and touching [35].

Aggression at the serving bar was linked to venues with poorly coordinated staff, suggesting that strategies for preventing aggression at the serving bar might include: ensuring sufficient staff to reduce frustrations and other provocation associated with service delays and better training of servers in managing drink refusals.

A relatively large proportion (5%) of incidents occurred at the entrance considering that only about 20% of establishments had queues to enter. This proportion and the positive association with the presence of security staff suggests a need for better training of staff who manage entrances, including preventing patrons from jumping the queue, treating patrons in line with respect and setting fair entrance policies [see 12].

Although previous research has found that a large proportion of incidents occurred partly or wholly outside the bar [19], this location accounted for only 2.3% of incidents in the present study, possibly due to the relatively small time spent outside because of cold weather during much of the observations and good public transit. However, this is likely an underestimate of the violence occurring outside premises because it excludes incidents that started at inside locations and moved outside. Moreover, outside incidents were found to be among the most severe. Thus, the area surrounding the drinking establishment should be an important focus for bar management and violence prevention.

Although this research contributes new information about barroom hotspots, it has some limitations. The “hotspots” identified in the present study reflect a certain time and place. While the taxonomy of hotspots likely applies across venues, the relative proportions would vary depending on the sample of venues and the time and day of week. Another limitation is the lower than desirable inter-observer ratings on some of the variables of interest.

Despite these limitations, this research extends previous knowledge regarding general environmental risk factors for aggression by identifying specific hotspots where aggression actually occurred. Additionally, the association of hotspots with environmental characteristics points to specific directions for prevention.

Acknowledgments

Work on this paper was supported by a grant from the U.S. National Institute of Alcohol Abuse and Alcoholism (NIAAA) (R01AA017663) as was the original research on which the paper is based (R01AA11505). In addition, support to CAMH for salary of scientists and infrastructure has been provided by the Ontario Ministry of Health and Long Term Care. The contents of this paper are solely the responsibility of the authors and do not necessarily represent the official views of the NIAAA or NIH or those of the Ministry of Health and Long Term Care. We are grateful to Nick Bernards who did the location coding and to Sue Steinback for her help with various aspects of production of the manuscript.

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Table 1

Inter-observer agreement on environmental variables

	Night-level inter-observer agreement	Bar-level inter-observer agreement ^a
	<i>Kappa & % agreement</i>	<i>Pearson's r</i>
Whether there was a queue (line-up) ^b	Kappa = .88 (95%)	r = .95
Whether pool tables were in use ^b	Kappa = .92 (96%)	r = .99
Whether dancing was taking place ^b	Kappa = .83 (95%)	r = .97
Whether any security staff was present ^b	Kappa = .88 (97%)	r = .98
	<i>Pearson's r and % agreement within one rating for ratings 0–9</i>	
Percentage of female patrons	r = .71	r = .88
Percentage of patrons under 25 years of age	r = .68	r = .79
Movement, crowding, noise level scale (combined ratings on a scale of 0–9 of amount of movement, crowdedness on and off the dance floor and noise level)	r = .84 (74%)	r = .96
Number of people in the bar at peak	r = .94	r = .99
Smokiness and poor ventilation scale (combined ratings on a scale of 0–9 of level of smokiness and extent of staleness/stiffness of air)	r = .60 (67%)	r = .86
Uncleanliness and messiness scale (combined ratings on a scale of 0–9 of extent that premises were unclean and messy, extent that tables, ledges and other counters were unclean and not cleared and extent that restrooms were unclean) ^c	r = .63 (64% ^c)	r = .85
Sexual activity, contact and competition scale (combined ratings on a scale of 0–9 of extent of sexual behavior, extent of sexual contact in dancing and extent of sexual competition)	r = .73 (65%)	r = .94
Intoxication level was rated according to the overall intoxication level of patrons at the time during the observation period when the bar was busiest (0–1 – no signs of intoxication; 2–3 – more than a few showing mild signs of intoxication; 4–5 – some are loud boisterous, most showing some effects; 6–7 – more than a few people unsteady, slurring speech; 8–9 more than a few people drunk, staggering)	r = .59 (69%)	r = .87
Rowdiness and permissiveness scale (combined ratings on a scale of 0–9 of general level of rowdiness and extent of lack of decorum/behavioural expectations)	r = .47 (64%)	r = .80
Total number of staff	r = .87	r = .96
Lack of coordination by staff ^d	r = .44 (52%)	r = .80
Lack of monitoring by staff ^d	r = .38 (57%)	r = .63
Lack of professional boundaries by servers and bartenders ^d	r = .43 (66%)	r = .67
Lack of professional boundaries by security staff ^d	r = .45 (68%)	r = .65
Number of people around after closing	r = .76	r = .87

^aBar-level inter-observer agreement was calculated by comparing ratings averaged across female observers for each bar to ratings averaged across male observers.

^bNo = 0, Yes = 1.

^cExcluding cleanliness of washrooms because the male and female observers rated different washrooms.

^dRated on a scale from 0–9.

Table 2

Number, percent and severity of incidents in each location

Location	N	Percent of incidents occurring in that location	Percent occurring when location was crowded	Average maximum severity rating	Percent of incidents by maximum level of harm done by any person in the incident				
					Minor nonphysical	Minor physical	Moderate-severe nonphysical	Moderate-severe nonphysical & minor physical	Moderate-severe physical
Dance floor									
- On the dance floor	211	20.0	79.5	9.25	19.4	53.6	3.3	3.8	19.9
- Near the dance floor	121	11.5	70.3	8.83	19.8	50.4	8.3	8.3	13.2
At or near serving bar	165	15.7	53.0	8.56 ^a	25.5	46.7	9.1	3.6	15.2
Tables	139	13.2	28.2	8.05 ^b	36.7	29.5	7.9	7.9	18.0
Areas intended for movement (e.g., aisles, hallways, stairwells)	65	6.2	27.7	8.09	32.3	43.1	4.6	6.2	13.8
Entrance including line-up	50	4.7	NA	7.69	44.0	6.0	34.0	0.0	16.0
Pool table area (if tables in use)	43	4.1	27.9	7.55	46.5	14.0	11.6	9.3	18.6
Outside bar	24	2.3	NA	12.15	29.2	4.2	12.5	12.5	41.7
Exit not related to coat check	21	2.0	4.8	8.38	38.1	19.0	19.0	4.8	19.0
Coat check including coat check lineup	18	1.7	52.9	8.89	22.2	27.8	38.9	0.0	11.1
Washroom	17	1.6	NA	5.91	52.9	11.8	23.5	5.9	5.9
All other inside locations	104	9.9	28.0	8.09 ^c	31.7	34.6	12.5	2.9	18.3
All incidents in known locations	978	92.5	43.3	8.54	29.9	38.5	21.2	7.5	9.8
Staff ejecting patron(s) originating location unknown	66	6.2	NA	12.38 ^{abc}	6.1	30.3	12.1	3.0	48.5
Patron conflict originating location unknown	13	1.2	NA	11.58	15.4	0	30.8	23.1	30.8
All incidents	1057	100.0	43.3	8.82	27.2	37.6	10.5	5.3	19.4

^{a,b,c} significant pairwise differences based on Scheffé test for pairwise comparisons

NA: Not applicable – only indoor areas (excluding washrooms) of the bar were rated for crowding.

Table 3

Odds ratios from 3-level (incident, night, bar) bivariate HLM analyses regressing each environmental variable on whether aggression occurred in each location

	On or near the dance floor		At or near serving bar		Tables		Pool table area		Areas of movement		Entrance	
	Night-level	Bar-level	Night-level	Bar-level	Night-level	Bar-level	Night-level	Bar-level	Night-level	Bar-level	Night-level	Bar-level
<i>Dichotomous variables</i>												
Presence of a line-up	0.559**	6.432***	1.242	0.428	1.045	0.246	0.905	0.023***	1.912*	0.746	2.345	0.700
Pool tables in use ^a	0.512**		1.254			2.172*	--	--	0.793		0.505*	
Dancing taking place	--	--	0.842	0.612	1.315	0.168*	0.514	0.073**	2.304	3.844	0.143	43.425*
Presence of security staff ^a	24.612***		0.617			0.458	0.095***		2.048		5.050*	
<i>Scaled variables</i>												
Number of patrons in bar at peak	0.999	1.003**	0.999	1.000	1.000	0.996*	1.003	0.989***	1.000	1.001	1.000	1.001
Number of staff	0.996	1.056*	0.996	0.989	0.995	0.937	1.076	0.788**	0.987	1.048	0.989	1.030
Proportion female patrons	1.008	1.089***	0.972*	1.006	0.988	0.950**	1.001	0.943	1.021	0.994	0.995	1.033
Proportion patrons aged less than 25	0.998	1.022*	0.987*	1.008	1.013	0.954**	0.994	0.982	0.995	1.018	1.011	0.996
Movement, crowding and noise level	0.999	1.648**	0.876	0.989	1.130	0.559***	0.866	0.546*	1.495*	0.902	1.112	1.103
Sexual activity, contact and competition	1.142	1.419**	1.014	0.886	0.890	0.668**	0.832	0.535***	1.325*	1.148	0.940	1.191
Intoxication of patrons	1.065	0.941	0.946	0.936	1.237**	1.085	0.911	0.681	0.888	1.278	0.987	0.911
Rowdiness/permissiveness	1.062	0.882	0.967	0.972	1.206*	1.086	1.089	0.464*	1.068	0.979	0.890	1.000
Smokiness and poor ventilation	1.161*	1.466	0.901	0.690	1.011	0.691	1.027	0.448*	1.046	1.104	0.962	0.973
Extent premises were unclean and messy	0.946	1.254	1.028	0.870	1.053	0.614*	0.921	0.580	1.147	1.109	1.017	1.074
Lack of staff coordination	1.033	0.696**	0.928	1.252*	1.057	1.191	0.933	2.167**	1.074	0.749	0.989	0.876
Lack of monitoring by staff	1.051	0.672*	1.011	1.146	0.980	1.085	0.995	2.107*	1.053	0.781	0.872	0.986
Lack of professional boundaries by servers/bartenders	0.978	0.587**	1.050	1.295	1.063	1.766*	0.663**	1.760	0.991	0.670	1.012	0.706
Lack of professional boundaries by security staff	1.049	0.714	0.933	1.305	1.064	1.289	0.853	1.970*	1.006	1.019	1.060	0.914
Number of people around after closing	0.993	1.055**	1.002	0.959	0.999	0.920**	1.008	0.829***	1.008	1.087***	1.002	1.017

^aSeparate analyses not possible for night and bar level because of a lack of within bar variance.

* p<.05,
** p<.01,
*** p<.001.