

Where do adolescents get drunk?

A study of the relative importance of various drinking locations among Norwegian adolescents

Introduction

It is well documented that drinking to the point of intoxication represents a major risk factor for acute harms (Babor et al. 2003) – notably among young people (Jernigan 2001). Hence, many countries have implemented measures to restrict the availability of alcohol among young people such as age limits for purchase and/or consumption of alcohol (Jernigan 2001; Österberg & Karlsson 2002). Nevertheless, the prevalence of heavy episodic drinking and related harm among youth call for significant concern (Anderson & Baumberg 2006; Jernigan 2001). From a preventive perspective, it may be useful to know where adolescents actually get drunk. By analysing data from a school survey of 14–17 year-old Norwegians, the present study adds to the meagre body of research on this issue.

Previous studies have primarily focused on where adolescents *drink* rather than where they *get drunk*. These studies suggest that youthful drinking most often occurs in private homes – at least in European countries and in the USA (e.g. Donnermeyer & Park 1995; Forsyth & Barnard 2000; Hibell et al. 2004; Mayer et al. 1998; Treno et al. 2000). Moreover,

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ABSTRACT

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To curb the harmful consequences of drunkenness among adolescents, it may be useful to know where they usually drink to the point of intoxication. We have analysed data from a school survey among 14–17 year-old Norwegians in 2005 to shed light on this issue (n=13 399). We assessed the prevalence of getting drunk at various locations and estimated the relative importance of various locations (i.e., the proportion of the total number of episodes of getting drunk that had taken place in various locations). About half of the episodes of getting drunk occurred in private homes. Although the respondents were too young to drink at licensed premises, about one in ten episodes took place in such locations. Relatively few episodes occurred at social events at school or in connection with organized leisure activities. The relative importance of the various locations varied with age and frequency of intoxication, whereas gender differences were less pronounced. Implications for prevention and further research are discussed.

■ KEYWORDS

Alcohol, drunkenness,
drinking location,
adolescent, underage,
survey, Norway

drinking in licensed premises seems to be fairly common among 15–16-year-olds in many European countries (Hibell et al. 2009).

The above-mentioned studies do not necessarily give a good picture of where adolescents get drunk because they do not reach the point of intoxication every time they drink. Based on data from the European School Project on Alcohol and Drugs (ESPAD/ Hibell et al. 1997; Hibell et al. 2000) Babor et al. (2003) estimated that 15–16-year-olds in Norway get drunk in about 60 % of the times they consume alcohol. This proportion is generally higher in the Nordic countries than elsewhere in Europe and in the USA (Babor et al. 2003).

The likelihood that a drinking event evolves into intoxication may depend on factors such as context-specific drinking norms and extent of formal control (Lange & Voas 2000), informal control by parents or other adults (Connolly et al. 1992), and peer influences (Borsari & Carey 2001). The importance of such factors will obviously vary with drinking venues. In some drinking venues, such as bars and pubs, formal and informal social control may be exerted (Oostveen et al. 1996), whereas other drinking venues, such as home-alone-parties, lack external social control of the family and local community (Beccaria & Sande 2003). The price of alcohol is another factor that may increase the likelihood of drinking to the point of intoxication in private homes rather than in public drinking places.

Based on (1) the studies showing that private homes is an important *drinking* location for adolescents and (2) the assumed low degree of social control in such locations – at least at home-alone-parties, we expected to find that private homes are particularly important locations for *getting drunk*. Although Norwegian law prohibits serving of alcohol to persons below 18 years of age, underage drinkers relatively often drink at licensed premises (Rossow et al. 2005; Storvoll et al. 2008). In the present paper we examined whether they also get drunk in such locations. Moreover, we addressed how often they get drunk at social events in connection with school and organized leisure activities.

We assumed to find that those who approached the age limit were more likely to get drunk at licensed premises than younger adolescents. The oldest were also expected

to be more likely to get drunk in private homes: They are probably both more often allowed to have parties at home and more often have access to parties in other people's homes. Whether the locations of getting drunk vary with drinking frequency and gender was also examined.

Previous studies have usually assessed the location of adolescents' most recent drinking occasion (e.g. Forsyth & Barnard 2000; Hibell et al. 2004; Mayer et al. 1998). Hence, the most recent drinking location for each respondent counts the same irrespective of the individuals' frequency of consuming alcohol. If the distribution of drinking venues differs for those who drink frequently and those who drink more seldom, this method may give a distorted picture of the overall distribution of drinking venues. To overcome this problem, one needs data at the event level, i.e. data on the total number of drinking episodes in a given period for each category of location. To our knowledge, such an approach has rarely been applied, and there seems to be no previous study that has addressed the *relative* importance of the various locations where adolescents get drunk.

■ Aims of the study

By analysing data from a school survey of 14–17 year-old Norwegians, the aim of the present study was to 1) describe the prevalence of getting drunk at various locations and 2) assess the relative importance of various locations (i.e. the proportion of the total number of episodes of getting drunk that had taken place in various locations). Whether this varies with age, intoxication frequency, and gender was also explored.

Data and methods

■ Participants and procedure

The data stemmed from a Norwegian school survey conducted in 2005. This was the second of three annual surveys carried out in connection with an evaluation of a community-based prevention project targeted at substance use and related problems. The evaluation indicated no effects of the project in this respect (Baklien et al. 2007). The target sample comprised students in all junior and senior high schools in 16 municipalities (nine that had taken part in the community prevention project and seven control municipalities). These municipalities represented various geographical regions of Norway as well as various degrees of urbanisation. However, none of the largest cities was represented in the sample. Altogether 85 of the 92 schools in these municipalities took part in the survey.

At each school one of the employees was in charge of the data collection. Pupils and parents/guardians were given information about the survey through the school. In line with the regulations, they were informed that participation was voluntary. Moreover, they were informed that everyone who took part in the study would be given a lottery ticket with the chance to win a price worth NOK 20 000 for a holiday of their choice for the whole family. Students at junior high schools needed a written informed consent from parent/guardian to participate.

The questionnaires, which were distributed and completed in the classroom under the supervision of a teacher, included questions about substance use, alcohol-related harms, and a wide range of suggested risk factors. The response rate was 84 %

($n = 21\,295$). In some cases whole classes did not participate in the study (due to e.g. excursions). When they were excluded from the target sample, the response rate was 87%. The sample and procedures have been described in detail elsewhere (Pape et al. 2007).

The analyses were confined to 14–17-year-olds ($n = 14\,453$), i.e. adolescents who were likely to have had some experience with being intoxicated but were too young to drink at licensed premises. To make it easier to interpret the findings regarding drinking at one's own home we excluded those who lived alone or with other adolescents ($n = 985$). Finally, some respondents were excluded due to inconsistent or apparently humorous answers ($n = 69$). Thus, the sub-sample analyzed in the present paper comprised 13 399 adolescents. The mean age was 15.5 (s.d. = 1.1) and the gender distribution was almost even (49.6% girls).

■ Measure on drinking locations

The respondents were asked how many times during the last twelve months they had drunk to the point of intoxication in the following places: 1) their own home, 2) someone else's home, 3) a licensed premise close to home, 4) a licensed premise elsewhere in Norway, 5) parties at school or on trips arranged by the school, 6) parties or trips arranged by an athletic club, marching band, youth organization, etc., and 7) other places. The answers were given on a six-point scale: never (coded 0), 1 time (1), 2–4 times (3), 5–10 times (7), 11–20 times (14), and more than 20 times (21). In order to test whether the relative importance of the various drinking locations was sensitive to the value of the upper frequency

category, the analyses were also run applying the values 30 and 40 for this category.

To get a rough measure of the total number of episodes of intoxication, we constructed a sum index of frequency of getting drunk at all places, including at "other places" (possible range: 0–147). Based on this sum index we found that 50% of the respondents ($n = 6\,455$) had got drunk during the last twelve months, and among these 55% had got drunk 1–10 times, 19% 11–20 times, 12% 21–30 times, and 14% more than 30 times.

■ Validation of the data and the key measure

The respondents were asked two questions that were used to validate the data and the key measure, i.e. how many times during the previous year they had 1) consumed alcohol and 2) consumed so much alcohol that they felt clearly intoxicated. The response categories were never (coded 0), 1–4 times (2), 5–10 times (7), once a month (12), 2–3 times in a month (24), once a week (52), and 2 times or more in a week (104).

First, we examined whether the proportion of the drinking episodes that resulted in intoxication resembled those revealed in previous studies. Roughly estimated, 59% of the drinking occasions resulted in intoxication (mean frequency of being clearly intoxicated: 5.7 (s.d. = 13.6)/ mean frequency of drinking: 9.8 (s.d. = 17.9)). This figure corresponds very well with those observed among the 15–16-year old Norwegians who participated in the ESPAD study in 1995 (60%) and 1999 (61%) (Babor et al. 2003).

Second, we compared the composite measure (based on questions about frequency of getting drunk in specified plac-

es) with the single question on frequency of drinking to the point of intoxication. The proportion that had been drunk during the previous year was almost identical when applying these measures (50 % and 47 %, respectively). Yet, as expected the mean frequency of drunkenness was higher for the former measure (7.7, s.d. = 14.2) than for the latter (5.7, s.d. = 13.6). This may partly reflect variation in the possible range for the two measures (0–147 and 0–104, respectively). Moreover, it may be easier to recall the episodes of drunkenness when asked about the frequency of getting drunk at various locations than when asked about the overall frequency of being intoxicated. All subsequent analyses were based on the composite measure.

■ Statistical analyses

Analyses of individuals. Differences (by age and gender) in the proportions that had got drunk (1) at least once and (2) in the various locations were tested using Pearson's χ^2 . In cases where the subgroups compared had different age or gender distributions, we controlled for this in logistic regression analyses. Differences in mean frequency of intoxications were tested using one-way analysis of variance with F-tests. Due to the large sample size and a fairly large number of comparisons, we used the one per cent level of statistical significance in these analyses.

Analyses of events of intoxications. The relative importance of each drinking location was calculated by dividing the total number of times the respondents had got drunk in the various locations (*100) by the total number of overall episodes of drunkenness. Whether the relative importance of each drinking location varied

for different groups (by age, frequency of intoxications, and gender) was initially tested using Pearson's χ^2 . Due to the large number of estimated drinking episodes ($n = 98\,752$), negligible differences were also statistically significant. Thus, we considered whether these group differences were of a substantial size rather than whether they were statistically significant.

When comparing groups with different age and/or gender distributions, the proportions were adjusted for this. As regards the prevalence of getting drunk at various drinking locations (analyses of individuals), adjusted proportions were calculated using logistic regression analyses. As regards the relative importance of various locations (analyses of events), adjusted proportions were calculated using adjusted mean scores (multiple classification analysis). Since the main pattern of findings was similar when considering adjusted and unadjusted proportions, only unadjusted proportions are presented in the tables. Details about the adjusted proportions are presented in the table notes.

Results

■ The prevalence of getting drunk at various locations

Analyses of subjects who had been intoxicated at least once during the previous year (50 %, $n = 6\,455$) showed that the vast majority (92 %) had got drunk in someone else's home (Table 1). Moreover, a fairly high proportion had got drunk in their own home (42 %) and in licensed premises (33 %). The prevalence of getting drunk at social events in connection with school or organized leisure activities was lower (18 % and 16 %, respectively). A sizable proportion (68 %) had got drunk at "other places"

Table 1. The proportion that had got drunk at least once and the proportion that had got drunk at various locations during the last twelve months by age and gender. D = Among respondents who had been drunk at least once (N=6 455)¹. A = Among all respondents (N=12 856).

N	Got drunk at least once	Got drunk at ...												
		Licensed premise		Social event – school		Social event – leisure activity		Own home		Other's home		Other places		
		D	(A)	D	(A)	D	(A)	D	(A)	D	(A)	D	(A)	
All	12,856	50	33	(17)	18	(9)	16	(8)	42	(21)	92	(46)	68	(34)
Age														
14	3,180	20	20	(4)	16	(3)	15	(3)	32	(6)	79	(15)	70	(14)
15	3,086	41	23	(10)	18	(7)	15	(6)	35	(14)	89	(37)	71	(29)
16	3,611	65	31	(20)	21	(13)	16	(10)	39	(26)	93	(60)	69	(45)
17	2,979	75*	44*	(33*)	16*	(12*)	16 ^{ns}	(12*)	50*	(38*)	95*	(71*)	65*	(48*)
Gender														
Girls	6,396	54	31	(17)	16	(9)	13	(7)	39	(21)	93	(51)	69	(38)
Boys	6,446	46*	35 ^{ns}	(16 ^{ns})	20*	(9 ^{ns})	19*	(9*)	45*	(21 ^{ns})	90*	(42*)	67 ^{ns}	(31*)

* p<0.001. ^{ns} not statistically significant.

¹ In this subsample the age distribution was somewhat different among girls and boys. Thus, when testing whether the age and gender differences were statistically significant we controlled for gender and age, respectively. In addition, the proportions were adjusted for different gender and age distributions. Since there were only minor differences between the adjusted and unadjusted proportions (1 %), only unadjusted proportions are presented in the table.

than those specified in the questionnaire.

Among those who had been drunk during the last year, the proportion that had got drunk at licensed premises and in private homes increased with age (Table 1). Moreover, somewhat more boys than girls had got drunk at social events in connection with school and organized leisure activities and at home.

■ The relative importance of various locations

The estimated number of episodes of

drunkenness was 98 752. It should be underlined that this is a crude estimate that is better suited to calculate the relative importance of the various drinking locations than to describe the total number of intoxication episodes. In descending order, the relative importance of the specified locations of getting drunk were (Table 2): someone else's home (45 %), licensed premises (11 %), one's own home (9 %), social events in connection with school (4 %), and social events in connection with organized leisure activities (4 %).

Table 2. Mean frequency of intoxication, events of intoxication, and the proportion of the events that had taken place at various locations by age, frequency of intoxication, and gender. Estimated among respondents who had been intoxicated at least once during the last twelve months.¹

	N	Mean frequency of intoxication (SD)	Estimated number of intoxication episodes	Relative importance of various locations (%)						Total
				Licensed premise	Social event – school	Social event – leisure activity	Own home	Other's home	Other places	
All	6,455	15.3 (16.9)	98,752	11	4	4	9	45	27	100
Age										
14	619	8.6 (13.0)	5,328	10	7	6	8	36	33	100
15	1,274	11.8 (14.1)	15,024	8	4	5	7	43	33	100
16	2,333	15.9 (17.5)	37,002	10	4	4	8	46	28	100
17	2,229	18.6 (17.7)*	41,398	14	3	3	10	47	24	100
Frequency of intoxication										
1–4	1,810	2.5 (1.2)	4,607	4	3	3	7	56	27	100
5–9	1,407	6.9 (1.2)	9,669	7	4	3	8	52	26	100
10–20	1,551	13.7 (3.1)	21,258	8	4	3	8	50	28	100
21 +	1,687	37.5 (18.7)*	63,218	13	4	4	9	42	27	100
Gender										
Girls	3,472	14.4 (14.7)	49,950	10	3	3	7	49	28	100
Boys	2,977	16.4 (19.1)*	48,725	12	4	5	10	42	27	100

* p<0.001.

¹ In this subsample the age distribution was somewhat different among girls and boys. Whether this had any substantial influence on age and gender differences in relative proportions were examined by adjusting the proportions for different gender and age distributions, respectively. In addition, the relative proportions were adjusted for different age and gender distributions when comparing subgroups based on frequency of intoxication. Among those who had been drunk from 1 to 4 times the adjusted proportions (6, 1, 1, 8, 63, and 20) differed somewhat from the unadjusted proportions. In all other cases, there were only minor differences (1 %). Since the main pattern of findings was similar when considering adjusted and unadjusted proportions, only unadjusted proportions are presented in the table.

In 27 % of the times the respondents got drunk they did so at places other than those mentioned above.

To test whether the relative importance of the various locations for getting drunk was sensitive to the choice of the value of the upper frequency category in the semi-continuous scales (i.e. > 20 times), all the

analyses were re-run twice applying the values 30 and 40 instead of the original value (21). The relative importance of the various drinking locations was hardly affected by these changes. With an upper frequency category value of 21, the highest possible value on the sum index of intoxication episodes was 147. This corresponds

to almost 3 times per week every week throughout the year. Since it is reasonable to assume that hardly any 14–17-year-old school children in Norway get drunk more often than that, we kept 21 as the upper frequency category value in all subsequent analyses.

Among the oldest subjects, a larger fraction of the episodes occurred at licensed premises and in private homes compared to the youngest subjects (Table 2). On the other hand, a smaller fraction of the episodes had occurred at social events in connection with school and organized leisure activities and at “other places”.

The heaviest drinkers (i.e. the 26 % who had been intoxicated more than 20 times during the last year) accounted for more than half of the episodes of drunkenness. Compared to less extreme drinkers, they got drunk relatively more often in licensed premises and relatively less often in someone else’s home. This pattern persisted when controlling for age.

Some minor gender differences in the relative importance of the various locations were also observed: Boys were somewhat more likely than girls to get drunk in their own home, while girls were somewhat more likely to get drunk in other people’s homes.

Discussion

The present study of where Norwegian adolescents usually drink to the point of intoxication indicates that private homes are particularly important locations. More than half of the times the respondents got drunk they did so in private homes. This finding is in line with what we expected: Previous studies have shown that private homes are an important location for ado-

lescent drinking – irrespective of whether they get drunk or not (Donnermeyer & Park 1995; Forsyth & Barnard 2000; Hibell et al. 2004; Mayer et al. 1998; Treno et al. 2000). Moreover, the degree of social control is probably fairly low in such locations – at least at home-alone-parties.

In line with our findings, a Danish study showed that adolescents more often attended private parties (usually held in private homes when the parents are not at home) than other kinds of party arrangements, and that the main purpose of such parties is to get drunk (Demant & Østergaard 2007). In Norway, so-called home-alone-parties are often associated with wild partying and excessive underage drinking. Hence, parents have been warned against leaving their teenage offspring home alone at night – notably during the weekend.¹

As expected, the relative importance of private homes as a venue for getting drunk increased by age. This may partly reflect that parents become less restrictive towards drinking (e.g. Koutakis et al. 2008), and probably also to having parties at home, as their offspring approaches the legal drinking age. Moreover, the social network of older adolescents is more likely to include young adult friends who live by themselves. The latter implies that parties in other people’s homes to a relatively larger extent will occur without any parental control.

The literature on young people’s drinking has recently paid attention to the sequencing of drinking in private and public venues. Several studies have demonstrated that pre-party drinking (i.e. drinking before the main party event), and drinking in private homes before and/or after

visiting public drinking places are associated with more heavy drinking and an increased risk of alcohol related harms (Pedersen & LaBrie 2007; Wells et al. 2009). It is possible that a substantial proportion of the episodes of getting drunk in private homes reported in our study represented the practice of pre-drinking. However, our questionnaire did not distinguish between pre-drinking, home-alone-parties, and other drinking situation in private homes. Whether the episodes of getting drunk in private homes typically occur in connection with private parties or in connection with pre-drinking, and how this varies with age, are interesting questions for further research.

Teenagers' widespread use of private homes as a location for getting drunk may be taken as an indication that preventive measures targeting parents should be given higher priority. A group of Swedish researchers recently developed an intervention (Koutakis et al. 2008) which is interesting in this respect. The input, which is embedded in the school's ordinary parent meetings, is aimed at promoting strict rules against underage drinking and at strengthening the parents' collective influence by encouraging them to formulate shared guidelines regarding home-coming hours, unsupervised partying, etc. An evaluation of the programme has given promising results: "Working via parents proved to be an effective way to reduce underage drinking" (Koutakis et al. 2008, 1629).

About one in ten times the adolescents got drunk they did so in licensed premises – despite the ban against serving alcohol to persons less than 18 years of age. However, the proportion that had visited public drinking places when they were drunk

may have been even higher: Some of the adolescents may have visited licensed premises after they had been drinking to the point of intoxication at other places.

Studies from the USA also indicate that public drinking places is a fairly important location for underage drinking and drunkenness (e.g. Harford et al. 2002; Lee et al. 1997). Moreover, previous studies of underage drinkers in Norway indicate that it is quite common to drink at licensed premises (Rossow et al. 2005; Storvoll et al. 2008). Correspondingly, a Norwegian survey (Rossow et al. 2007) as well as field studies from Norway (Buvik & Baklien 2006), Sweden (Wallin & Andreasson 2004), and other countries (e.g. Forster et al. 1995; Vaucher et al. 1995) suggest that minors often succeed when trying to obtain alcohol in licensed premises.

As expected the relative importance of licensed premises as a location for getting drunk was somewhat higher among the 17-year-olds than among younger teenagers. Correspondingly, previous research has shown that minors who approach the legal age for drinking are more likely to try to buy alcohol at licensed premises and to succeed when doing so (Rossow et al. 2007). Moreover, the relative importance of such venues was higher among frequent heavy drinkers than among those who got drunk less frequently. This may partly reflect variations in pubertal timing, as adolescents with an early onset of puberty both drink more (e.g. Kaltiala-Heino et al. 2003; Lanza & Collins 2002; Stattin & Magnusson 1999) and more often drink at licensed premises (Storvoll et al. 2008) than their peers.

Other arenas where adults are often present, and thus may have the potential

to intervene in adolescents' drinking, are social events at schools and in connection with organized leisure activities. The *proportion* of the students who reported that they had got drunk at such events was fairly high. In relative terms, however, these locations were less important. This may, at least in part, reflect that there are probably relatively few such events per year.

Nearly one in three times the respondents got drunk they did so in locations other than those specified in the questionnaire. What kind of locations are these? According to the ESPAD study, 15% of 15–16-year-old Norwegians had been drinking in the street, at the beach, in a park, etc. on the most recent drinking day (Hibell et al. 2004). Studies from other countries also suggest that adolescents often drink outdoors (Forsyth & Bernard 2000; Hibell et al. 2004; Stoduto et al. 1998) and that drinking in such locations often result in drunkenness (Forsyth & Bernard 2000). Thus, future studies should consider outdoor locations as well.

■ Methodological considerations

Representativeness of the sample. It is reason to assume that our sample is fairly representative of 14–17 year-old Norwegians: It was composed of students in municipalities from various geographical regions and with various degrees of urbanization. Moreover, the vast majority in this age group attends school, almost all junior and senior high schools in the selected municipalities participated in the survey (85/92), and the response rate was fairly high (84%). However, none of the largest cities in Norway was represented in the sample. Since (1) the availability of licensed premises is greatest in large cities

and (2) the informal control of underage drinking in such locations probably is lower in large cities than at smaller places, the relative importance of licensed premises may have been underestimated.

Measure of intoxication. As we have discussed elsewhere (Pape et al. 2008), intoxication is a subjective state, and the amount of alcohol that is required to reach this state may vary considerably. The number of drinks that it takes to feel drunk has been found to vary with age, gender, and frequency of drunkenness (Kerr et al. 2006). Thus, when comparing the locations where such sub-groups get drunk it may be favorable to apply measures of self-perceived intoxication rather than objective measures of heavy episodic drinking, such as five units or more on one occasion. Moreover, a Finnish study, which addressed the association between self-perceived drunkenness and estimated maximum blood alcohol concentration, concluded that 14–18-year-olds are competent to judge their state of intoxication (Lintonen & Rimpelä 2001).

Our estimates are probably somewhat inaccurate since the scale for assessing frequency of getting drunk at various locations was fairly crude. Moreover, some respondents may have had problems to recall all episodes of drunkenness during the previous year. Others may have over-reported. Since we asked the respondents how many times they had got drunk at various locations, and not where they had been when they were intoxicated, it is likely that most respondents reported only one location for each incidence of drunkenness. However, we cannot rule out the possibility that some reported more than one location; – for example if they moved

from one place to another and got increasingly intoxicated. If this had been a major problem, the mean score on the composite measure based on questions of getting drunk in specified places should have been considerably higher than the mean score on the single question about intoxication frequency, but it was not.

■ Conclusion

The present paper adds to the body of knowledge on adolescents' drinking venues by focusing on where minors *get drunk* rather than where they *drink* alcohol. Moreover, it provides new insights by assessing the relative importance of various locations. The most important venue for getting drunk was private homes. Despite the ban of serving alcohol to persons less than 18 years of age, licensed premises was also a fairly important location. The relative importance of the various locations

varied with age and frequency of intoxication, whereas gender differences were less pronounced. More research, including qualitative studies, is needed to flesh out the story behind our figures.

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NOTES

- 1 See e.g. <http://www.nrk.no/nyheter/dis-trikt/rogaland/jaeren/1.6226464>.

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