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Research Paper

# Sisters are never alike? Drug control intensity in the Nordic countries

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ABSTRACT

*Background:* The Nordic countries — Denmark, Finland, Norway, and Sweden — have traditionally had different approaches to drug control policies. From the late 1980s to the early 1990s, Sweden and Norway were the most restrictive countries. Prior research has described how Nordic control policies became more repressive after this, but no research has examined this claim using the intensity of implementation as a measure.

*Methods:* This study uses data collated by the EMCDDA to examine drug control intensity from 2000 to 2016. The four countries are compared on three measures: seizure numbers relative to total population, seizures numbers by type of drug relative to population, and cannabis seizures relative to the number of annual cannabis users. Standard bivariate tests for statistical significance are used to compare control intensity over time and between countries.

*Results:* Compared to an earlier period from the late 1980s to the early 1990s, Denmark maintained the level of drug seizures to population from 2000 to 2016. Finland increased intensity by 176 percent but remained at the lowest level in the region. Norway increased by 18 percent and is currently the country with the highest enforcement intensity. Sweden reduced overall intensity by 57 percent, which decreases the level for the region by 22 percent. Sixty to seventy percent of all seizures in every country was for cannabis. Accounting for cannabis prevalence rates changes the ranking of enforcement intensity in the countries.

*Conclusion:* Drug control intensity in the Nordic countries has harmonized over time. The disparity between the extremes of low control intensity in Finland and high intensity in Sweden has been reduced. Denmark is still comparatively lenient to users when considering high cannabis prevalence rates and Norway has taken the position as the strictest country on all control intensity measures.

## Introduction

Drug policies transect multiple domains and are commonly referred to in terms of control, treatment, harm reduction, and prevention. The control component is meant to reduce the availability of drugs through interventions that target the production, distribution, and sale of illicit psychoactive substances. These interventions mostly, but not exclusively, consist of legal regulation and practical implementation of law enforcement (Babor et al., 2010). Deciding on an appropriate intensity of control requires considering the balance between the public good and citizens' freedom, an ambivalent tradeoff between crime repression and welfare concerns (Laursen & Jepsen, 2002).

Historically, the Nordic countries — Denmark, Finland, Norway, and Sweden — have displayed substantial variation in balancing these concerns (Bruun & Rosenqvist, 1980). Hakkarainen, Laursen, and Tigerstedt (1996, p. 15) described the Nordic countries as "sisters" and placed them on a continuum "running from the pragmatic liberalism of Denmark to the extremely restrictive control policy of Norway." Hauge (1996, p. 194) quantified this control as enforcement intensity, sanction certainty, measured as drug arrest per 1,000 population. From 1985 to 1992, he found that Finland had a low level at 0.5, with Denmark at 2.5, Norway at three, and Sweden at four. Hauge (1996, p. 198) concluded by describing a trend in Nordic drug control policies "towards a common denominator, with the rate in Denmark rising and the rate in Sweden falling," but noted that lack of comparable data prevented more in-depth analysis.

This study is aimed at updating and improving the comparison of Nordic drug control policies, using data collated by the European Monitoring Center for Drugs and Drug Addiction (EMCDDA). Since Hakkarainen et al. (1996) and Hauge's (1996) studies, there has been no research on Nordic drug control policies that examines whether the predicted developments occurred (Korsell & Larsson, 2011). This omission is glaring in light of drug-use trends of the late 1990s. Cannabis prevalence increased markedly in the Western world including in Nordic countries (Feilding et al., 2008). This inspired the theory of normalization where Parker (2005) describes a widespread acceptance of recreational use among young people, high accessibility, and cultural accommodation of illicit drug use. This type of growth in the underlying

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problem pressure will typically prompt policy adjustments (Adam & Raschzok, 2014), but it is an open question of how the Nordic countries responded to these developments.

The Nordic countries share a history of developing advanced social-democratic welfare state regimes in the 21st century with strong cultural values of equality, inclusion, and political climates of compromise and consensus (Esping-Andersen, 1990). Criminal justice policies reflect these values and the region constitutes a cluster with exceptionally low prison populations, at only 50–99 per 100,000 population (Brydensholt, 1980; Lappi-Seppälä, 2007; Pratt, 2008). However, several criminologists have noted that overall criminal justice policies have been moving in a repressive direction since the late 1990s (Balvig, 2005; Tham, 2012). Von Hofer (2005, p. 151) described the trend from "tough on inequality and tough on the causes of inequality" toward a "tough on crime and tough on criminals," Scandinavian style.

This style implies that the control component is becoming increasingly repressive, but at the same time, treatment options for the worst-off segments of the drug using population have improved (Houborg, 2010; Laursen & Jepsen, 2002). The Nordic research on the control component is critical of law enforcement's capacity to reduce drug market problems. Korsell & Larsson (2011, p. 533) summed the sentiment as follows: "Aggressive law enforcement seems to have strengthened the market for illegal drugs and made it more adaptable. The volume of drugs smuggled into the Nordic countries seems to be greater today than ever before." Most of this research has focused on legal amendments and sanction severity when characterizing control policies in the region. With Hauge (1996), and a few others as exceptions (Moeller & Hesse, 2013; Moeller, 2012), there is a lack of research that examines law enforcement implementation and sanction certainty.

Even in international research, studies of control policy implementation are rare (Pollack & Reuter, 2014) and comparative studies are especially lacking (Burris, 2017; Ritter, Livingston, Chalmers, Berends, & Reuter, 2016). This imbalance is noteworthy firstly because control policies constitute upwards of 76% of public expenditure on drugs (in Sweden and the Netherlands) (Reuter, 2006). Secondly, research on deterrence finds that perceived sanction certainty is more effective than eventual sanction severity (Paternoster, 1987). To better understand control policies and how drug markets respond, we need to have analyses of policy implementation, specifically on law enforcement intensity and sanction certainty.

Using data on drug seizure numbers and cannabis prevalence, I examine three research questions:

1) Overall control intensity trend: How do levels of control intensity from 2000 to 2016 compare to the level in 1988–1992?
2) Drug-specific control intensity: How many seizures, relative to the age-relevant population, by drug type, have each country made from 2000 to 2016?
3) Cannabis control intensity relative to prevalence: How many cannabis seizures are made, relative to the number of annual cannabis users, per country?

The progression in these questions goes from measuring control intensity at the broadest level, seizures to total population, to more specific measures that include types of drugs relative to the relevant age band, and measuring cannabis seizures against an estimated cannabis-using population. The aim is to present a current and comparative assessment of control intensity in the four Nordic countries. The findings are discussed in relation to the characterizations of the historical drug control continuum and broader criminal justice policy trends.

## Data and methods

The primary data source is a series of statistical bulletins available from the EMCDDA website (EMCDDA, 2018). For each European country, there are yearly data entries on drug seizure numbers for the following drug types: amphetamine, cannabis resin, cannabis herb, cocaine, ecstasy, ecstasy tablets, and heroin. Drug seizures by police are the first step in the judicial process. Not all seizures will be registered as reported offenses (if the police are somehow unable to complete the investigation), and even fewer end up as convictions (Pedersen & Skardhamar, 2010). Seizure numbers are, therefore, a better proxy for control intensity as compared to criminal statistics. Further, most European countries, including the four Nordic countries, do not register the type of drug in drug law offenses (Mounteney et al., 2016). Seizure numbers are the only available drug-specific measure of control implementation.

### *Measures*

To examine how overall control intensity has evolved over time, I depart from the data presented by Hauge (1996) to establish a baseline measure. The first measure is the mean annual number of drug seizures per 100,000 population in each of the Nordic countries from 1985–1992. Next, I calculate the corresponding figure for each Nordic country for the period 2000–2016, using EMCDDA data. The population data was retrieved from national statistical bureau databases (Statistikbanken, Statistics Finland, Statistikkbanken, Statistikdatabasen). The national means for the two periods, as well as the region as a whole, are compared using t-tests. This gives a first approximation of control intensity trends over time.

Next, I calculate the drug-specific control intensity. For this more detailed analysis, I measure intensity relative to the relevant age band, 16–34 years, where drug use and drug sanctioning is most prevalent (Nguyen & Reuter, 2012). The purpose is to add details to the overall intensity measure by comparing the distribution of drug types in seizures. This measure provides an expression of policy priorities and drug problems in each country, as well as the region, when accounting for population sizes in each country. To examine if the variations between numbers of seizures by drug types are statistically significant, I compare the overall distribution against a hypothesized even distribution in a chi-square test.

Finally, I examine how the measure of control intensity for each country changes, when considering differences in cannabis prevalence rates. I follow Nguyen and Reuter (2012) and calculate cannabis control intensity relative to prevalence (cannabis use in the past 12 months), by dividing the number of cannabis seizures with the number of annual cannabis users (divided by 1,000). Cannabis use and sanctions for cannabis possession are concentrated among young people (Moeller, 2010) and I assume all seizures are made in the age band of 16–34 years (note that Finland uses a slightly different age band of 15–34 years). The number of cannabis seizures relative to this theoretical cannabis-using population is compared against the countries with the closest rate on this measure in t-tests. This provides a test of whether the country position on the Nordic continuum is significantly different from the adjacent country. These estimates are calculated based on the years for which prevalence data are available.

The EMCDDA publishes illicit drug prevalence studies from the European countries annually. These reports consist of data provided by a network of national health authorities, organized in focal points, which "coordinate national expert networks responsible for submitting and checking data" (Mounteney et al., 2016, p. 37). They are general population surveys with a high degree of standardization that uses representative probabilistic samples. These cannabis prevalence estimates are largely considered as reliable (Fendrich & Johnson, 2005). However, not all European countries are equally diligent in reporting both law enforcement and prevalence data every year.

The national reporting of prevalence data has improved over the study period, but there are still several gaps as most countries only publish biannual data. I use linear interpolation to compensate for missing years. Denmark published four reports from 2008 to 2017 that provide nine data points after interpolation. Finland published six

reports spanning 2000 to 2014, but there is a large gap from the first report in 2000 to the next report in 2004. I only use the data from 2004 to 2014, for a total of 11 data points. Norway also published five reports, but for a period from 2012 to 2016, providing five data points. Finally, Sweden has published a report every year since 2006, providing 11 data points on cannabis prevalence.

The focus of this study is on the 2000–2016 period (t = 17) where the data coverage is most complete. To reduce the number of missing data points, I combined the data on the number of cannabis resin seizures and cannabis herb seizures into the Cannabis seizures category. Similarly, the categories Ecstasy and Ecstasy tablets were combined into one category called Ecstasy seizures. After these adjustments, the dataset contains 299 observations out of a possible 340 observations (seventeen years, four countries, five types of drugs), corresponding to 88 percent data coverage.

## Results

I examine illicit drug control intensity using three measures. First, overall control intensity is measured as rates of drug seizures to the total population for the period 1988–1992 against the period 2000–2016. Next, I disaggregate the seizure data for the period 2000–2016 into drug types, to examine if some countries have focused on certain drug types more than others. Finally, I include cannabis prevalence data to estimate the control intensity relative to prevalence. I conclude by discussing the findings in relation to the assessment of drug control and criminal justice trends from Nordic drug researchers and criminologists.

### *Overall control intensity*

I compare the estimates of drug control intensity presented by Hauge (1996) with data from the EMCDDA for the period 2000–2016 to examine if control intensity has changed in each country. The mean for the region is weighted by population size. Denmark, Finland, and Norway have similar population sizes in the range of 4.5–5.7 million. Sweden has substantially more at 8.9–10 million during the period of examination, corresponding to 38 percent of the total Nordic population. Table 1 below presents the mean rate in each country for the two periods, the difference in rates, and the percentage change.

From 1985–1992, Sweden made the highest number of drug seizures relative to its population, with Norway coming second, Denmark third, and Finland much lower. This control continuum historically characterized the Nordic region (Bruun & Rosenqvist, 1980; Hakkarainen et al., 1996). In the recent period from 2000 to 2016, Sweden has significantly decreased the number of drug seizures to less than half of former levels, and now has the second lowest rate in the region when measured against the total population. Norway still has the highest control intensity but now Denmark has the second highest, despite a small reduction. Finland has remained the lowest, despite a large and significant relative increase from a mean of .49 to a mean of 1.35 seizures per 1,000 population. The overall control intensity for the Nordic region, weighted by country population size, has decreased by a statistically significant 22 percent. The marked reduction in Swedish control intensity has influenced the rate for the entire region because of Sweden's large share of the total Nordic population.

### *Drug-specific control intensity*

Here, I examine seizure numbers by drug type and relative to population size. To get a better impression of the control experienced by drug users I divide the number of seizures with the age-relevant population of 15–34 years. This age band constitutes approximately 25 percent of the total population in all four countries. Table 2 below displays the mean annual number of seizures by drug type and country. For each drug type, I compare the number of seizures to a hypothesized even distribution, highlighting which countries make more or fewer seizures of specific drug types.

When inspecting the data by country, it is notable that Denmark is responsible for only 17 percent of total Nordic amphetamine seizures but 56 percent of all cocaine seizures. Conversely, Finland has a low share of cocaine seizures at three percent and four percent of heroin seizures. Norway has the highest overall control intensity and is responsible for almost 40 percent of all cannabis seizures and 55 percent of all heroin seizures. Relative to population, Sweden has less than their expected share of total seizures for all drug types, with low numbers for cocaine and heroin seizures. The overall relative distribution of seizures by drug type and country is significantly different from a hypothesized even distribution in the chi-square test.

Further examination reveals that in each country, there are variations in priorities between drug types. A third of all drug seizures in Finland are of amphetamine while the figure is only 12 percent in Denmark. Finland has few cocaine seizures while in Denmark more than one in ten seizures is for cocaine. Ecstasy and heroin seizures are relatively rare compared to other drugs in all countries. Cannabis constitutes a dominant portion of all seizures in every country, between 60 and 70 percent.

### *Cannabis seizures relative to prevalence*

As a final measure, I calculate an expression of how control specifically targeting cannabis relates to the number of estimated users in the age band 16–34 years. Annual cannabis prevalence rates differ between the Nordic countries with Denmark having the highest mean of 14.95 percent (SD = 2.0) for 16–34-year-olds from 2008-2017. Finland has a mean prevalence of 8.14 percent (SD = 4.32) for 15–34-year-olds from 2004-2014. Norway has a slightly higher mean prevalence at 9.14 percent (SD = 1.63) for 16–34-year-olds 2012–2016, and Sweden the lowest at 6.11 percent (SD = 0.98) for 16–34-year-olds from 2006 to 2016. Differences between countries are tested in two-sample t-tests against the nearest neighbor.

Table 3 below displays the mean annual number of seizures relative to prevalence for each country and a sample mean. N is the number of years for which there are prevalence estimate (some interpolated) and

**Table 1**
Overall enforcement intensity in 1985–1992 and 2000–2016: Seizures per 1000 population.

| | Denmark | Finland | Norway | Sweden | Sample mean |
|---|---|---|---|---|---|
| 1985-1992 Mean (SD) | 2.51 (.71) | 0.49 (.10) | 3 (.36) | 4.06 (.69) | 2.74 (.53) |
| Range rate | 1.5-3.5 | 0.4-0-7 | 2.6-3.1 | 3.2-5.2 | 0.4-5-2 |
| 2000-2016 Mean (SD) | 2.40 (.73) | 1.35 (.43) | 3.53 (1.11) | 1.75 (.53) | 2.15 (.75) |
| Range | 0.51-4.37 | 0.74-2.16 | 0.79-4.95 | 0.93-3.04 | 1.35-3.53 |
| Mean difference | −0.12 | 0.86 | 0.53 | −2.31 | −.59 |
| 95 % CI difference | 0.53-0.76 | 0.54-1.19 | 0.86-1.91 | −1.79–2.84 | .27- .91 |
| t (df) | 0.37 (23) | −5.52 (21) | −0.80 (18) | 9.14 (22) | 3.74 (90) |
| p | .71 | < .001 | .43 | < .001 | < .001 |
| % change | −4 | 176 | 18 | −57 | −22 |

**Table 2**
Annual mean seizure number per 100,000 population aged 16–34 by country, drug and percent of total seizures of that drug type.

| Country | Denmark | Finland | Norway | Sweden | Mean | Chi-square |
|---|---|---|---|---|---|---|
| Amphetamine | 144 (23) | 216 (46) | 293 (86) | 206 (52) | 211 (76) | |
| % of total | 16.76 | 25.15 | 34.11 | 23.98 | | 110.7 |
| Cannabis | 778 (258) | 374 (108) | 1071 (163) | 474 (143) | 678 (326) | |
| % of total | 28.85 | 13.87 | 39.71 | 17.58 | | 6.9 |
| Cocaine | 138 (67) | 8 (5) | 67 (20) | 33 (25) | 64 (62) | |
| % of total | 56.10 | 3.25 | 27.24 | 13.41 | | 105.3 |
| Ecstasy | 37 (19) | 30 (13) | 42 (25) | 22 (17) | 33 (20) | |
| % of total | 28.24 | 22.90 | 32.06 | 16.79 | | 6.5 |
| Heroin | 62 (23) | 9 (12) | 127 (40) | 33 (14) | 59 (51) | |
| % of total | 26.84 | 3.90 | 54.98 | 14.29 | | 38.4 |
| N | 78 | 70 | 77 | 74 | | |
| Total | 1,159 | 637 | 1,600 | 768 | | 267.79 (df = 12; $p < .001$) |

Note: Standard deviation in parentheses. N is the number of observations available from each country.

**Table 3**
Cannabis control intensity relative to prevalence. Seizures per 1000 cannabis users aged 16–34 years.

| | Denmark | Finland | Norway | Sweden | Sample |
|---|---|---|---|---|---|
| N | 9 | 11 | 5 | 10 | 35 |
| Mean | 57.22 | 50.71 | 138.40 | 92.50 | 76.80 |
| CI | 48.8–65.6 | 34–67.4 | 114.6–162.2 | 83.1–101.9 | 64.7–89 |
| SD | 10.97 | 24.91 | 19.17 | 13.10 | 17.89 |
| Range | 48.2–78.3 | 35.2–121.4 | 113.9–159.2 | 74.3–110–1 | 35.2–159.2 |

Note: N is the number of observations available from each country.

seizure data. The sample mean is weighted by population sizes.

The mean for the region was 76.8 seizures per 1000 cannabis users, which implies that Denmark and Finland are below average and Norway and Sweden are above average. The difference between the lowest number of seizures relative to prevalence in Finland ($M = 50.71$, $SD = 24.91$) and, second lowest, Denmark ($M = 57.22$, $SD = 10.97$) is not statistically different ($t(18) = 0.726$, $p = 0.478$, 95% CI -12.34; 35.35). The difference between Denmark and Sweden ($M = 92.50$, $SD = 13.10$) is significant ($t(17) = 6.323$, $p < .001$, 95% CI 23.50; 47.05). The difference between Sweden and Norway ($M = 138.40$, $SD = 19.17$) is also significant ($t(13) = 5.504$, $p < .001$, 95% CI 27.89; 63.92).

Measured in this way, relative to cannabis use rates, the position of the Nordic countries on the control continuum changes. Norway still has the highest enforcement intensity in the region, but the rate in Sweden is now the second highest because of the comparably low cannabis prevalence. Denmark has the highest cannabis prevalence rates in the region and, despite a sustained high number of cannabis seizures over time, Denmark is still comparatively lenient towards its cannabis users. Finally, Finland approaches the level of enforcement of cannabis in the remaining countries measured against the size of its user population.

## Discussion

Returning to the three research questions, this study showed that overall control intensity levels have changed substantially in Finland and Sweden while remaining relatively stable in Denmark and Norway. The position of the Nordic countries on the drug control policy continuum that Hakkarainen et al. (1996) described has changed over time. The change is primarily borne by the reduced intensity of Swedish control. As a result of Sweden's large share of the total population, this change reduces overall enforcement intensity by 22 percent for the entire Nordic region. Hauge's (1996) prediction of the trend towards a common denominator in control intensity was correct.

Next, I examined the seizure data that is divided into drug types to form a more detailed impression of which countries prioritize which drug types, or alternatively, which drug types cause them more problems. Seizure numbers reflect both policies, prevalence, policing priorities, and use of discretion. The Nordic countries display variations in their composition of drug seizures, but it is not possible to ascertain from these data whether these differences are borne out of differences in use rates, policy priorities, or both. Plausibly, Finland and Sweden have a tradition for amphetamine use (Hakkarainen et al., 1996) and that could explain the higher frequency of amphetamine seizures. I refrained from pursuing this question for all five drug types because the prevalence data for drugs other than cannabis are less reliable (Babor et al., 2010).

Therefore, to examine if drug-use rates affected seizure numbers, I focused on cannabis. Between 60–70 percent of all seizures in the Nordic countries are for cannabis. Cannabis prevalence increased during the late 1990s and maybe the alleged trend towards repressive control policies is driven by this increase in offending rates, the underlying problem pressure (Adam & Raschzok, 2014). I examined this possibility further by measuring control intensity relative to the number of cannabis users. Measured against prevalence rates, the countries' position on the control continuum shifted. As a result of the high rates of cannabis prevalence in Denmark, control intensity experienced by users is lower here, compared to Sweden and Norway.

All three measures presented in this study are focused on sanction certainty. This analysis does not answer the question of whether the criminal justice trend towards an increased focus on law and order and repressive rather than welfare-oriented drug policies, has occurred. While sanction certainty is arguably most important for deterrence, sanction severity is an important part of the symbolic and communicative elements of criminal justice policies. The downward trend in seizure numbers that I have described could occur simultaneously with an upward trend in average seizure amounts. For example, Sweden's reduction of overall enforcement intensity may be counterweighed by an increase in average sanction severity. Higher average seizure amounts could suggest police targeting higher distribution levels while low amounts indicate a propensity for street-level possession and retail sale offenses. Two countries with similar rates of seizure numbers to their population can have very different levels of sanction severity. As convictions for distribution carry heavier criminal sanctions, this is a more repressive policy. Including measures for sanction severity will provide a more realistic appraisal of the deterrent effects of drug control policy and a more nuanced assessment of overall policy priorities.

Finally, I have used a data-driven approach to control policy coding throughout the study (Burris, 2017). While these data allow for comparison within each country over time and between countries, it is decidedly an input model where I measure what the Nordic countries do and not what outcomes the policies produce. It is beyond the scope of the present article to examine outcomes regarding associations between enforcement intensity and consumption, harms, and prices. These factors belong in a comprehensive evaluation of drug control

policies over time and between countries. The present study was less ambitious as I set out to examine the long-held notion of a Nordic control policy continuum. This was meant to serve as the first step towards a comprehensive Nordic comparative drug policy analysis.

## Conclusion

Hakkarainen et al. (1996) described drug control policies in the Nordic countries with the phrase "sisters are never alike." Even though these countries share similar histories of political development and a common welfare-based approach to criminal justice policies, they have had marked differences in their control policies. Measured as the number of drug seizures to population, Sweden and Norway have practiced a more repressive approach than Denmark and Finland. In this study, I examined if the countries still hold their position on this policy continuum, twenty years after the original description. Using three measures for control intensity, this study has added insights into the temporal trend in enforcement intensity and added nuances to the overall impression of increasing repression in drug control.

First, the temporal trend has moved countries closer to each other over time. Finland has markedly increased its number of drug seizures compared to the 1990s while Sweden has decreased theirs. Considering Sweden's large share of the total population in the Nordic countries, this development entails a reduction in the mean annual number of drug seizures to the population of the entire region. Secondly, the Nordic countries display different patterns concerning the types of drugs seized. Denmark has the highest proportions of cocaine seizures while Finland and Sweden have high proportions of amphetamines. Norway has the highest overall intensity and is overrepresented in the share of the total number of seizures for most drugs.

Finally, drug use rates vary substantially in the region. Estimated cannabis prevalence is 50 percent higher in Denmark compared to other countries. When adding the number of cannabis users to the calculation of control intensity, the overall impression of the country's position along the policy continuum changes. Denmark's position as a traditionally lenient nation is reaffirmed. The high number of cannabis users implies each user is less likely to be sanctioned in a typical year, compared to Sweden and, especially, Norway. As Sweden has relatively few cannabis users, their chance of encountering police is markedly higher than users in Denmark or Finland.

In conclusion, the differences in levels of intensity of drug control policy implementation between the Nordic sisters have reduced over time. When taking cannabis prevalence into account, Denmark is still quite lenient while Norway is the most repressive country in the region. Future research should include trends in seizure amounts for the various drug types for a more comprehensive assessment of control priorities. Ideally, a more ambitious analysis should assess how access to treatment and harm reduction vary in the region and how this affects the national balances between control and welfare.

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