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BRIEF REPORT

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The Impact of a Widely Publicized Celebrity Suicide on Suicide-Related Internet Search Activity

Martin Ø. Myhre and Fredrik A. Walby

ABSTRACT

Objective: Media reporting of celebrities' deaths by suicide are prone to suicide contagion effects. The aim of the current study is to examine whether the widely publicized celebrity suicide of Ari Behn in Norway was associated with changes in search activity of suicide-related terms.

Method: Search activity data for the terms "suicide," "Ari Behn suicide," "how to suicide," and "suicide prevention" were retrieved from Google Trends. We analyzed data as an interrupted time series and used *T*-tests to compare means before and after the suicide. Crude linear models examining the association between searches for "suicide" over time and an adjusted model controlling for searches after "Ari Behn suicide" were built. The models were tested with structural change tests.

Results: A significant increase in search activity for "suicide" ($p = <.001$), "Ari Behn suicide" ($p = .002$), and "how to suicide" ($p = .006$) was found after the suicide. Searches for "suicide prevention" were not significant ($p = .11$). The structural change test was significant both for the model that did not control for explicit searches ($p = <.001$) and for the model controlled for explicit searches ($p = <.001$).

Conclusions: A recent widely publicized suicide in Norway was associated with increases in Google searches for suicide. No indications of the Papageno effect were found. The media should be cautious when reporting about the suicides of prominent public persons. Compliance with generally accepted media reporting guidelines may need more attention.

HIGHLIGHTS

- We found a significant increase in search activity for suicide related terms.
- More attention should be devoted to careful media reporting on celebrity suicides.
- Media should consider the volume of publicity carefully.

KEYWORDS
Contagion; Google Trends; suicide; Werther effect

Media reporting of suicide can have harmful effects: *Werther effects*, and protective effects: *Papageno effects* (Niederkrotenthaler et al., 2010). Thus is it important that media minimize harmful effects and enhance protective effects when reporting suicide stories. The reporting of celebrity suicides is often different from portrayals of other

suicides and has a larger potential risk for suicide contagion effects. An 8−18% increase in suicide rates after celebrity suicides have been found in a meta-analysis

(Niederkrotenthaler et al., 2020). There is some evidence that increased risk for contagion may be limited to entertainers and politicians (Stack, 1987). An example is the suicide of Robin Williams, which was associated with a 9.85% increase of the suicide rates in the US (Fink, Santaella-Tenorio, & Keyes, 2018).

In one study, search activity on Google from Google Trends is to some extent positively correlated with suicide rates based on aggregated data (Gunn & Lester, 2013). Search activity may provide important information that enables more real-time monitoring, since suicide statistics often have a considerable delay. It is nevertheless important to be aware that Google Trends have limited validity (Tran et al., 2017). Gunn, Goldstein, and Lester (2020) used Google Trends to assess potential Werther and Papageno effects after celebrities death by suicide, finding weak support for both effects.

From 1993 until his death, Ari Behn was a prominent public figure, author, and painter with several appearances on TV series and shows. His celebrity status increased after he married princess Märtha Louise of Norway in 2002. They were divorced in 2017. He died by suicide Christmas day 2019. His family immediately revealed that he died by suicide. A burst of media coverage of the death started immediately. The weeks after his death saw extensive media coverage about him, including direct minute-to-minute coverage of the funeral on two national TV-stations, leading to an unparalleled amount of media coverage after a death by suicide in Norway. Therefore, the aim of the current study is to assess if the comprehensive news coverage of the incident had an impact on search activity for suicide-related terms. Furthermore, we wanted to assess if a potential increase reflected the Werther effect or Papageno effect.

METHOD

Data Sources and Variables

The current study used data from Google Trends (www.trends.google.com). Google Trends presents Google search activity aggregated and categorized and is used to retrieve information about interest in a specific subject; it contains open and free-of-charge data. Search interest from Google Trends is a relative index ranging from 0 to 100 where 100 indicates the day with most Google searches during the selected period. A value of 50 indicates that the subject is half as popular as the day with a value of 100. Zero values indicate that is insufficient data to generate search interest for the term. Due to the instability of Google Trends results, data were retrieved daily from Google Trends from October 18, 2020 to October 25, 2020. We then estimated the mean of search interest during this period – following the recommendation of Tran et al. (2017).

We retrieved data from Google Trends for the terms "suicide" ("selvmord") compared with "Ari Behn suicide" ("Ari Behn selvmord"), "how to suicide" ("hvordan ta selvmord"), and "suicide prevention" ("selvmordsforebygging") for Norway between November 25, 2019 and January 23, 2020. The period represents 30 days before and after Ari Behn's suicide on December 25, 2019 (from here on called the index date). *How to suicide* and *suicide prevention* were included to assess the Werther and Pagageno effect, respectively (Gunn & Lester, 2013). *Commit suicide* was not included

TABLE 1. Differences in Google Trends search interest before and after the index date.

Søkeord	30 Days before *M (SD)*	30 days after *M (SD)*	*T*	*p*
«*Suicide*»	5.35 (1.70)	22.0 (21.4)	4.2541	<.001
«*Ari Behn suicide*»	0.0 (0.0)	6.00 (9.72)	3.3851	.002
«*How to suicide*»	5.55 (12.3)	17.1 (18.8)	2.8177	.006
«*Suicide prevention*»	3.38 (12.9)	10.6 (19.3)	1.6184	.11

in the current study since no search interest index could be produced for the term. The data and code used in the current study are accessible from the Open Science Framework (https://osf.io/tra79).

Strategy for Data Analysis

Data was analyzed with R version 3.6.2 (R Core Team, 2018). We tested the difference between the four search terms before and after the index date with *t*-tests. We also analyzed search interest as an interrupted time series for each search term. To analyze the time series we conducted a series of F statistics and analyzed break points using the *strucchange* package version 1.5-2 (Zeileis, Leisch, Hornik, & Kleiber, 2002). Breakpoint analysis is suitable for analyzing time series with large and instant increases. First, we built a crude model containing search interest for "suicide." We then built an adjusted linear model that also included search interest for "Ari Behn suicide" to control for the confounding effect of explicit searches after the index date. Structural change tests (sctest() function) were used to test the models. No models were built for "suicide prevention" or "how to suicide" due to missing data.

RESULTS

As seen in Table 1, we found a significant increase in mean search activity for both "suicide" and "Ari Behn suicide" after the index date. An instant high magnitude increase was observed in search interest for "suicide" after the index date, as shown in Figure 1. Another spike in search interest for "suicide" occurred on January 3, 2020—corresponding with the broadcasted funeral. Search interest for "Ari Behn suicide" followed the same pattern as "suicide" but with an overall lower magnitude of spikes.

Searches for "how to suicide" saw a significant increase in the period after the index date ($p = .006$). No significant differences between phases were observed for "suicide prevention" ($p = .11$). It was only possible to generate search indexes for 23 days regarding "how to suicide" and 13 days for "suicide prevention" during the total study period of 60 days. Probably due to a lower search volume. The distribution of valid search indexes did, however, differ between the terms, where searches for "how to suicide" increased in frequency after the index date, while searches for "suicide prevention" is approximately evenly distributed before and after the index date.

In the crude model which measured search interest over time, a break point was identified at the index date, with a significant structural change test ($F = 74.462$, $p = <.001$). In the adjusted model, which controlled for searches after "Ari Behn suicide," the break point was identified one week after the suicide corresponding to the

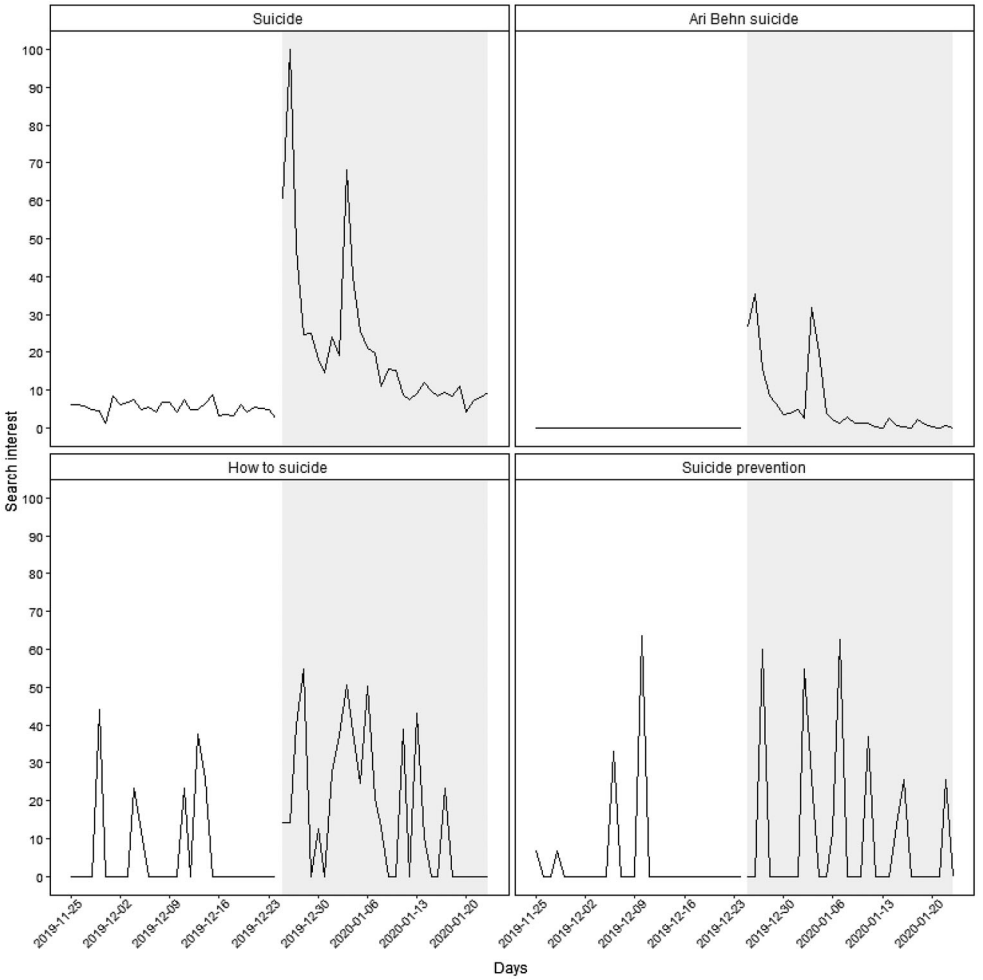

FIGURE 1. Displays mean search interest for the terms *Suicide*, *Ari Behn suicide, How to suicide*, and *Suicide prevention* over a one week period 30 days before and after the index event. Dates after Ari Behns suicide December 25, 2019 is gray in the plot. Zero values indicate that is was not sufficient search activity to generate search interest index.

broadcasted funeral. The structural change test for the adjusted model was also significant ($F = 57.295$, $p = <.001$).

DISCUSSION

We found a significant increase in search activity for "suicide" in the period after the index date. When controlling for searches after "Ari Behn suicide," we also found a significant increase, but the breakpoint in the time series occurred one week after the suicide. A significant increase was observed for "how to suicide," indicating a potential for Werther effects in the reporting of the current incident. No significant differences were found for "suicide prevention," implying that the media coverage did not indicate potential Papageno effects.

Some evidence supports that suicides by entertainers in particular have contagious effects (Niederkrotenthaler et al., 2020). The deceased in this study was a persistent public figure in Norway and media coverage of the suicide was massive over several weeks. A comparison to the suicide of Robin Williams seems reasonable, a suicide in which an increase in both Werther and Pagageno effect related searches, and an increase in suicide rates, were found (Fink et al., 2018; Gunn et al., 2020). The effect of the widely covered suicide on the suicide rates remains unknown, since suicide statistics in Norway have a more than one-year delay. However, given the significant association between the media reporting of the suicide and search activity, examination of the association between the media reporting of this incident and suicide rates seems warranted.

A unique aspect in this incident was the televised funeral, which included many celebrities and the entire Royal family of Norway. The funeral was broadcasted live on two national TV channels and covered extensively by other media. This caused a second spike in search activity as shown in the time series analysis. The risk of glorification of suicide is high when broadcasting a funeral. The coverage of the funeral was associated with a second spike in search activity leading to prolonged exposure. Given existing evidence that widely publicized suicides of entertainers or public figures can lead to contagion of suicidal behavior (Niederkrotenthaler et al., 2020), extensive reporting of funeral ceremonies, i.e. direct broadcasting, should be carefully considered from a suicide prevention perspective.

No significant differences were observed for "suicide prevention," indicating that the extensive coverage led to no protective effects. Searches for "how to suicide" were significant, indicating a possible Werther effect. If we also consider that the search term used probably does not capture the entire range of potential harmful search activity, this should warrant caution regarding extensive media coverage of a celebrity suicide, considering that no indications of Papageno effects were found.

The degree of missing data for "how to suicide" and "suicide prevention" is an important limitation of this study, which left us unable to model potential Werther and Papageno effects. It is also reasonable to assume that the search volume for these terms were much lower than for "suicide" and "Ari Behn suicide," given the low variability when the index is activated. Data on absolute search volumes would have strengthened the study design, but they were unavailable.

Uncertainty always exists regarding the intent of Google searches. In this study "suicide prevention" was used as a proxy for Papageno effects and "how to suicide" as a proxy for Werther effects. Consequently, the inferences from these proxies should be interpreted with caution and be considered as indications. Norway is a small country with 5.4 million inhabitants, so relatively rare search terms have an unstable occurrence in Google Trends. Suicide-related searches in Google Trends from Norway have not previously been examined. Most studies using Google Trends have been conducted in populations substantially larger than Norway, such as the USA (Gunn & Lester, 2013) and Japan (Hagihara, Miyazaki, & Abe, 2012).

It is important to include suicide preventive information, such as access help for suicidal individuals by suicide hotlines or health services in the period following the suicide. Media guidelines might be revised to focus more on protective factors as suggested by Maloney et al. (2014). Furthermore, very few studies have examined the efficacy of

media guidelines (Stack, 2020), and more knowledge is needed regarding how media guidelines can prevent imitation effects of suicide.

Increased openness regarding suicide in the media is important to reduce the stigma of suicide. Responsible media reporting of suicide is clearly different when high-profile celebrity suicide is involved, and this should lead to increased reflection among reporters and editors at large. While the impact of the current media coverage on the suicide rate is still unknown, this study warrants close monitoring of the suicide rate after similarly highly publicized incidents.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author(s).

AUTHOR NOTES

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DATA AVAILABILITY STATEMENT

This study used openly available data from Google Trends. The data used can be retrieved from https://osf.io/tra79/.

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