

RESPONSIBLY COMMUNICATING SUICIDE-RELATED RAILWAY DELAYS

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Responsibly Communicating Delays after Suicides on Railways: The Impact of Delay Announcements on Suicide-related Associations and Emotions, and Announcement Appreciation

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All authors designed the study. Lonneke van Leeuwen conducted the statistical analysis. All authors wrote the first draft of the manuscript and approved the final version.

Abstract

Background: By communicating *collision with a person* as a reason for post-suicide railway delays, railway companies may involuntarily communicate to the public that colliding with a train is a suicide method. **Aims:** To compare the impact of the *collision with a person* delay announcement with an announcement about *emergency services* and one about *collision with an animal* (control announcement), we measured suicide-related emotions, associations with suicide, and announcement appreciation. **Method:** A randomized controlled online experiment ($N = 664$). **Results:** After exposure to the *collision with a person* announcement, participants were 9.1 times more likely to indicate suicide as the most probable reason for the delay than after the *emergency services* announcement. The emotional impact of both announcements was low. Still, participants reported more anger toward the victim after exposure to the *collision with a person* announcement than after exposure to the *emergency services* announcement. Announcement appreciation was significantly higher after exposure to *collision with a person*. **Limitation:** This online experiment may have reflected real-life situations concerning train delays to only a limited extent. **Conclusion:** From the perspective of suicide prevention, the *emergency services* announcement is a more appropriate delay announcement than the *collision with a person* announcement.

Keywords: suicide prevention; responsible communication; suicides on railways; implicit association test.

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In the Netherlands, about 200 individuals die by suicide on the railways each year (ProRail, 2018), comprising about 10% of suicides in the country (CBS, 2018). Post-suicide train delays are communicated to the Dutch public as delays due to a *collision with a person* (Dutch: *aanrijding met een persoon*). The announcement is made via various media channels such as audio and text announcements at train stations, websites of local news organizations, and Twitter accounts. Suicides make up 94% of fatal train incidents after which *collision with a person* is broadcast (personal communication with ProRail, 2019). Therefore, the public may have grown to understand that *collision with a person* means that a suicide occurred and that colliding with a train was the method.

Confronting the public with suicide through this announcement may have an emotional impact on them (Majava & McNaughton Nicholls, 2015). They may experience feelings of sadness for the person involved or anger toward the person or organization that they hold responsible for the delay. More importantly however, communicating (albeit implicitly) that colliding with a train is a suicide method is risky from the perspective of suicide prevention. First, the availability of lethal means is a strong motivation for selecting these means for suicide (Law et al., 2009), and restricting access to lethal means is considered a key element of suicide prevention strategies (Hawton, 2007). It was shown in Hong Kong, for example, that the number of suicides on railways decreased after the implementation of measures that limited access to railway tracks (Law et al., 2009). In the Netherlands also, access-limiting measures have been implemented, such as fences and motion sensor lights. The *collision with a person* announcement, however, may convey to the public that colliding

with a train is still available as a suicide method, despite these measures. Second, the public may be frequently confronted with *collision with a person*, with 200 suicide incidents a year and the broadcasting of the announcement through various media channels. Therefore, *collision with a person* may communicate that multiple others used colliding with a moving train as a method to end their lives. Behavior change theories acknowledge that people's behavior is greatly influenced by what they see or hear of others doing (descriptive norms: Cialdini & Goldstein, 2004). Thus, the *collision with a person* announcement may add to the perception of the commonness of suicide by colliding with trains, which may in turn motivate individuals with suicidal behavior to perform the same behavior. Indeed, media studies have shown that mass media messages in which suicide methods are described may lead to imitative behaviors (e.g., Chen et al., 2014, 2016; Gunnell et al., 2015) and that refraining from describing suicide methods may prevent suicides (Etzersdorfer & Sonneck, 1998). Etzersdorfer and Sonneck's (1998) study, for example, showed a 75% decrease in suicide rates after newspaper professionals adhered to guidelines not to report details regarding railway suicides and not to give such reports front-page prominence.

A less risky announcement for communicating post-suicide-related train delays may be *due to emergency services* (Dutch: *inzet van hulpdiensten*). This announcement is currently broadcast in cases of non-suicide-related train delays involving emergency services such as ambulance/police services. A potential advantage of using this announcement for post-suicide delays is that the delay is not directly interpreted as suicide related. Associations with suicide may therefore be weaker, potentially lowering the commonness of suicide by colliding with trains and evoking fewer imitative behaviors and emotions. A potential disadvantage is that the announcement is less transparent about the exact cause of the delay and therefore may not be appreciated by the public (Majava & McNaughton Nicholls, 2015).

Identifying the optimal post-suicide delay announcement is challenging for railway companies. To our knowledge, only one study compared different delay announcements (Majava & McNaughton Nicholls, 2015). In that study, the announcement *due to a person [being] hit by a train* was compared to *emergency services dealing with an incident*. Although travelers found both announcements informative, the latter announcement was perceived as less graphic and less upsetting than the first. Given these results, it was recommended to use the *emergency services dealing with an incident* announcement rather than *due to a person [being] hit by a train*.

Although the *collision with a person* announcement is broadcast via multiple media channels in the Netherlands, its impact on emotions and imitative behaviors may depend on the personal relevance of the announcement. People receive many (media) messages in daily life but have only limited time and capacity to process them. The Elaboration Likelihood Model suggests that individuals scrutinize only those messages that are personally relevant (Petty & Cacioppo, 1986). Delay announcements like *collision with a person* may be most personally relevant for passengers on the train involved in the incident and for travelers awaiting this train. When individuals consider the announcement, its associations with suicide may be triggered and strong emotions may be experienced. Thus, the impact of the *collision with a person* announcement may be limited to a subgroup of the public, namely those for whom the announcement is personally relevant.

Given this synthesis, we test the following hypotheses:

- H1: the *collision with a person* announcement is more strongly associated with the concept of suicide than *emergency services* or *collision with an animal* (control announcement).
- H2: the emotional impact of the *collision with a person* announcement is stronger than that of *emergency services* or *collision with an animal*.

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- H3: personal relevance of the delay increases the impact of the delay announcement, such that those who are not affected by the delay form weaker associations with the concept of suicide and respond less emotionally.
- H4: the *collision with a person* and *collision with an animal* announcements are better appreciated than *emergency services*.

Method

Participants and Procedure

An email with a link to the online survey was sent to 3998 members of the Dutch railway consumer panel (minimum age: 18 years). This panel consists of about 70,000 train travelers, who agreed to participate in studies related to traveling by train. Participants for the current study were recruited via market research agency MWM2.

The study was described as being aimed at improving communications about railway delays. To prevent activation of the concept of *suicide*, we avoided suicide-related words in the study description. We also avoided references to the first and second authors' affiliation, the Trimbos Institute, a well-known mental health research institute. Upon entering the survey, participants gave informed consent and were randomized to exposure to one of six written scenarios (see Stimulus Material). Participants then completed the survey. On the debriefing page, we described the exact aims of the study and provided information about contacting the Dutch suicide prevention helpline (113 Suicide Prevention, www.113.nl). The Trimbos Institute's Ethical Committee gave ethical approval for the study.

Stimulus Material

The six scenarios differed on two factors. The first factor was type of delay announcement: *collision with a person*, *emergency services*, or *collision with an animal*

(control announcement). The second factor was personal relevance of the delay. In the *personally relevant* condition, the suspended train was the train to participants' imagined destination (Amsterdam). In the *not personally relevant* condition, the suspended train was not the train to participants' imagined destination (Arnhem). The scenarios with the manipulations are presented in Table 1.

Table 1

Stimulus Material. Description of the Scenario and Manipulations

Imagine this: you are walking on [platform 7 (*relevant*) / platform 3 (*not relevant*)] of Utrecht Central Station. You are about to take the train to [Amsterdam (*relevant*) / Arnhem (*not relevant*)] and are headed to an important appointment. You are on time: the train will arrive at your platform in 10 minutes: [platform 7 (*relevant*) / platform 3 (*not relevant*)]. Then, you hear the following message coming from the platform speakers: "Due to [cause of delay], the intercity to Amsterdam will not depart from platform 7." Then, information is given about how travelers can reach Amsterdam. [So, you can continue your journey as planned and without delay (*not relevant*)].

Note. (*Not*) *relevant* indicates whether the reader's imagined journey is (not) personally affected by the delay.

Measures

Manipulations checks. We used two open questions to verify whether participants were able to correctly reproduce the delay announcement content and whether their imagined journey was delayed or not.

Imagination. To ensure that participants were able to imagine themselves well in all scenarios, we assessed the extent to which they were able to imagine themselves in the scenario (0 = *not at all*, 10 = *very much so*). Mean imagination in all scenarios was high (> 7.56).

Explicitly measured associations with suicide. We asked participants to indicate which event was the most probable cause of the delay. The answer options were: collision with an animal, accidental collision with a person, emergency services handling an accident, terrorist attack, or collision with a person who was on the tracks on purpose. If participants responded that the delay was probably caused by a train colliding with a person who was on the tracks on purpose, we assumed participants explicitly associated the announcement with

suicide. If this event was chosen, the answer was coded as 1; otherwise, the answer was coded as 0.

Implicitly measured associations with suicide. Participants completed a suicide-related Word Association Test (WAT; see Electronic Supplementary Material 2). WATs measure implicitly the extent to which certain concepts are activated after exposure to stimuli (Stacy, Ames, & Grenard, 2005). For example, if the concept *suicide* is activated after exposure to a delay announcement, participants may associate the word “jump” with “jumping in front of a train”. If the concept *suicide* is not activated, participants may associate the word “jump” with things like trampolines, sports, or frogs.

In the WAT, five ambiguous stimulus words, randomly mixed with five filler words, were presented in Dutch: *way out*, *crisis*, *ambulance*, *attempt*, and *jump*. Participants were instructed to type the first word that came to mind after reading each of these words. At the end of the survey, the stimulus words along with the self-typed responses were presented. Participants then indicated which one of eight answer categories best matched each of their responses (Shono, Ames, & Stacy, 2016). If participants self-categorized their response as matching the category *suicide on the railway*, we coded the response as a suicide-related word. If this category was not chosen, we coded the response as a non-suicide-related word. The number of suicide-related words was summed (range 0 to 5) to yield a measure of implicitly measured associations with suicide.

Emotional impact. Emotional impact was assessed with five statements measuring emotions relevant to post-suicide delay announcements (Majava & McNaughton Nicholls, 2015). Participants indicated the extent to which they agreed with the statements (0 = *not at all*, 10 = *very much so*). A factor analysis revealed three factors. The first factor consisted of the items *I felt frustrated by the delay* and *I felt anger towards ProRail/Dutch Railways*. Responses to these items were averaged to yield a composite score labeled *Anger about the*

delay (Cronbach's $\alpha = .73$). The second factor consisted of the items *I felt sad for the victim* and *The incident affected me*. Responses to these items were averaged to yield a composite score labeled *Sadness about the incident* ($\alpha = .81$). The last item *I felt anger toward the victim* was included as a single-item measure *Anger toward the victim*.

Announcement appreciation. Participants indicated on a scale whether the announcement was unclear (score = 0) vs. clear (10), dishonest (0) vs. honest (10), not trustworthy (0) vs. trustworthy (10), and not informative (0) vs. informative (10). Factor analysis showed that these four items formed one factor. We therefore averaged them to yield one composite announcement appreciation score ($\alpha = .85$).

Statistical Analyses

We conducted a three-way loglinear analysis to explore whether the type of delay announcements and level of personal relevance were associated with explicitly measured associations with suicide (categorical outcome variable). For the other continuous outcome variables, a 3 (announcements) by 2 (levels of personal relevance) factorial ANOVA was performed. If the assumptions of these tests could not be met, bootstrapping procedures were performed (1000 bootstraps). All analyses were performed using IBM SPSS, version 22.

Results

Sample

A total of 898 surveys were completed. We excluded surveys from individuals who completed the survey more than once (63 surveys). Also, we excluded individuals who failed at least one of the manipulation checks (171 respondents). The data of the remaining individuals ($N = 664$) were analyzed in this study.

The sample consisted of 272 females and 282 males, and 110 participants did not specify their gender. Age was unknown for 181 participants. The 483 participants who did report their age had a mean age of 47.72 years ($SD = 15.96$).

Explicitly Measured Associations with Suicide

The loglinear analysis showed that three-way interactions were not significant, but the two-way interaction delay announcement by explicitly measured associations with suicide was significant ($\chi^2(7) = 305.67, p < .001$). To break down this effect, a separate chi-square test was performed on delay announcement and explicitly measured associations with suicide. This test confirmed a significant association ($\chi^2(2) = 274.40, p < .001$). The odds ratios showed that the odds of respondents indicating suicide as the most probable cause of the delay were 9.1 times higher after exposure to the *collision with a person* announcement than after *emergency services*, and 57.3 times higher than after *collision with an animal*. These results support H1.

The loglinear analysis showed that the two-way interaction of personal relevance of the delay by explicitly measured associations was not significant. H3 is not supported by this finding.

Implicitly Measured Associations with Suicide

Detailed results on the following analyses are presented in Table 2. There was no significant main effect of announcement type or personal relevance on the number of suicide-related words measured by the WAT. Neither H1 nor H3 is supported by these findings.

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Table 2

Means (M), Standard Deviations (SD), and Test of Between-Subjects Effects for the Continuous Outcome Variables

	Delay announcement			Level of personal relevance of the delay		Delay announcement x personal relevance
	Collision with a person (n = 225)	Emergency services (n = 191)	Collision with an animal (n = 248)	Relevant (n = 320)	Not relevant (n = 344)	
Implicitly measured associations with suicide*						
M (SD)**	1.19 ^a (1.00)	1.14 ^a (1.02)	1.01 ^a (0.95)	1.16 ^a (0.99)	1.06 ^a (0.98)	
Test of between-subjects effects	SS = 4.14, df = 2, MS = 2.07, F = 2.14, p = .12, η ² = .006			SS = 2.03, df = 1, MS = 2.03, F = 2.10, p = .15, η ² = .003		SS = 2.83, df = 2, MS = 1.42, F = 1.46, p = .23, η ² = .004
Anger about the delay***						
M (SD)	3.53 ^b (2.45)	3.95 ^{ab} (2.59)	4.05 ^a (2.90)	4.89 ^a (2.23)	2.87 ^b (2.68)	
Test of between-subjects effects	SS = 43.17, df = 2, MS = 21.59, F = 3.56, p = .03, η ² = .011			SS = 692.80, df = 1, MS = 692.80, F = 114.25, p < .001, η ² = .148		SS = 12.69, df = 2, MS = 6.35, F = 1.05, p = .35, η ² = .003
Sadness about the incident***						
M (SD)	4.74 ^a (2.77)	4.35 ^{ab} (2.82)	3.89 ^b (2.59)	4.52 ^a (2.69)	4.11 ^a (2.77)	
Test of between-subjects effects	SS = 83.26, df = 2, MS = 41.63, F = 5.67, p < .01, η ² = .017			SS = 20.86, df = 1, MS = 20.86, F = 2.84, p = .09, η ² = .004		SS = 24.28, df = 2, MS = 12.14, F = 1.65, p = .19, η ² = .005
Anger toward the victim***						
M (SD)	3.66 ^a (2.98)	2.22 ^b (2.57)	2.05 ^b (2.52)	2.93 (2.82) ^a	2.38 ^b (2.75)	
Test of between-subjects effects	SS = 344.57, df = 2, MS = 172.29, F = 23.83, p < .001, η ² = .068			SS = 46.90, df = 1, MS = 46.90, F = 6.49, p = .01, η ² = .010		SS = 13.67, df = 2, MS = 6.84, F = 0.95, p = .39, η ² = .003
Announcement appreciation***						
M (SD)	8.08 ^a (1.84)	5.89 ^b (2.32)	7.74 ^a (1.90)			
Test of between-subjects effects	SS = 562.76, df = 2, MS = 281.38, F = 69.58, p < .001, η ² = .174					

Note. SD = SS = sum of squares, MS = mean square.

* Range 0–5.

** Means of levels within the same independent variable that do not share the same superscript differ at p < .05.

*** Range 0–10.

Anger About the Delay

There was a significant main effect of delay announcement on anger about the delay. *Post hoc* tests showed that anger about the delay was significantly lower in the *collision with a person* condition ($M = 3.53$) than in the *collision with an animal* condition ($M = 4.05$). The other contrasts in delay announcements showed no significant differences. This result does not support H2.

There was a significant main effect of personal relevance on anger about the delay. In line with H3, anger about the delay was significantly lower ($M = 2.87$) when the imagined delay was not personally relevant than when it was ($M = 4.89$).

Sadness About the Incident

There was a significant main effect of announcement on sadness about the incident. *Post hoc* tests showed more sadness in the *collision with a person* condition ($M = 4.74$) than in the *collision with an animal* condition ($M = 3.89$). This partly supports H2, as the other contrasts in delay announcements showed no significant differences.

We found no significant main effect of personal relevance on sadness about the incident. This does not support H3.

Anger Toward the Victim

There was a significant main effect of announcement on anger toward the victim. *Post hoc* tests showed that anger toward the victim was significantly higher in the *collision with a person* condition ($M = 3.66$) than in the *emergency service* condition ($M = 2.22$) and the *collision with an animal* condition ($M = 2.05$). This result supports H2. There was no significant difference in anger toward the victim between the *emergency services* and the *collision with an animal* condition.

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There was a significant main effect of personal relevance of the delay on anger toward the victim. In line with H3, anger towards the victim was significantly lower ($M = 2.38$) when the imagined delay was not personally relevant than when it was ($M = 2.93$).

Announcement Appreciation

There was a significant main effect of announcement on announcement appreciation. *Post hoc* tests showed that announcement appreciation was higher in the *collision with a person* condition ($M = 8.08$) than in the *emergency services* condition ($M = 5.89$). Announcement appreciation was also significantly higher in the *collision with an animal* ($M = 7.74$) condition than in the *emergency services* condition. These results support H4. There was no significant difference in announcement appreciation between the *collision with a person* and the *collision with an animal* condition.

Discussion

We compared the effect of the railway delay announcements *collision with a person*, *emergency services*, and a control announcement (*collision with an animal*) on associations with suicide and on emotional impact.

First, the study showed that after the *collision with a person* announcement, participants were 9.1 times more likely to indicate that suicide was the most probable cause of the delay than after the *emergency services* announcement. This is in line with previous research (Majava & McNaughton Nicholls, 2015), where train travelers associated an announcement focusing on emergency services less with suicide than one focusing on collision with a person. Thus, the announcement *collision with a person* conveys the message of suicide by colliding with a train. Therefore, this announcement may contribute to public knowledge about the availability of trains as a means of suicide, which is a risk factor for suicide attempts (Law et al., 2009). The announcement may also contribute to public

perceptions regarding the commonness of suicide by colliding with trains (descriptive norms: Cialdini & Goldstein, 2004). As reducing the availability of highly lethal and commonly used suicide methods has been associated with declines in suicide rates of as much as 30%–50% (Barber & Miller, 2014), this result may encourage railway companies to communicate post-suicide delays to the public by broadcasting announcements that do not imply suicide by colliding with trains. As these delay announcements are communicated through multiple channels besides railway companies, such as local news websites and radio broadcasts, they may stimulate responsible reporting about suicide on a larger scale too. In addition, and also in line with guidelines for media reporting (Sinyor et al., 2018; World Health Organization, 2008), information about support services (i.e., a helpline) may be provided if the public experiences negative emotions after exposure to delay announcements.

The second main finding is that participants reported more anger toward the victim after *collision with a person* than after *emergency services*, although the emotional impact of both announcements was low. Potentially, *emergency services* emphasizes the involvement of emergency services in a delay-causing incident, whereas *collision with a person* emphasizes the involvement of an individual. This may explain why more anger toward the victim was reported after *collision with a person*.

The third main finding is that personal relevance of the delay did not influence implicitly and explicitly measured associations with suicide. This suggests that the concept of suicide may be unnecessarily triggered in individuals for whom the delay announcement is not personally relevant. Therefore, if railway companies want to minimize the number of persons forming associations with suicide, they should refrain from communicating *collision with a person* to those individuals who are not directly affected by the delay.

The fourth main finding is that, although participants appreciated both announcements positively, they appreciated *collision with a person* significantly better than *emergency*

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services. Perhaps participants considered *collision with a person* to be a more transparent announcement. Although *emergency services* was appreciated less, it did not evoke more anger about the delay.

Although the study provided interesting insights, the external validity of the study may be limited. The online experiment may have reflected a real-life train delay situation only to a limited extent. This would explain why participants' emotions were generally low and why the WAT yielded only one suicide-related word on average. In real-life situations, train travelers might have stronger emotions and implicit associations with suicide after exposure to *collision with a person*. Future research could investigate the impact of the different delay announcements in real-life situations.

Conclusion

From the perspective of suicide prevention, the *emergency services* announcement may be a more appropriate announcement for suicide-related train delays than the *collision with a person* delay announcement. Although train travelers may be more appreciative of the *collision with a person* announcement, *emergency services* provokes fewer associations with suicide and less anger toward the victim.

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