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Coping and health behaviours in times of global health crises: Lessons from SARS and West Nile

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We examined perceived threats of Severe Acute Respiratory Syndrome and West Nile Virus using an Internet-based questionnaire. Higher levels of perceived threats of diseases were associated with increases in a variety of ways of coping, including empathic responding and wishful thinking. In turn, we examined how coping with the perceived health threat was related to two specific health related behaviours: taking recommended precautions, and avoiding people in an attempt to avoid disease. The findings from linear regression indicated that empathic responding, in response to the threat of a virulent agent, was related to taking recommended and effective health precautions. On the other hand, wishful thinking was associated with those behaviours that may potentially lead to economic hardship in afflicted areas, such as avoiding people perceived to be at risk for an infectious agent. Implications for health promotion are discussed.

Keywords: global health; health behaviours; coping; SARS; West Nile

Introduction

Over the past few years, we have seen an increase in global fears of disease and infectious agents, such as severe acute respiratory syndrome (SARS), West Nile Virus (WNV) and most recently, the Avian Flu Virus. Over 8000 people worldwide were infected with SARS between November 2002 and July 2003, and approximately 10% died (World Health Organisation (WHO) 2006a). The SARS epidemic was the first infectious agent to cause a global media stir and mass panic since the beginning of the HIV crisis in the early 1980s. SARS impacted people physically, psychologically, socially and economically at the global level (United Nations Economic and Social Council (UNESCO) 2003, Leung and Guan 2004). For example, in Canada, it has been suggested that media coverage of SARS led to increased stigma, social alienation and discrimination of Asian-Canadians, leaving lasting psychological and social bruising on members of these communities (Leung and Guan 2004).

There is now concern of a global pandemic that is expected to leave many dead in its wake (Centres for Disease Control and Prevention (CDC) 2007). If we are to understand the course, and psychological, social and economic impacts of such agents, we need to explore the reactions of the general public to these diseases.

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Importantly, do ways of coping with the threat of an infection affect precautionary behaviours when faced with the threat of such diseases? Such information may prove essential to public health and health promotion in the face of communicable diseases.

Health behaviours

While health organisations and practitioners consistently offer information and behavioural recommendations to the public and affected individuals for all health problems (CDC 2006a, WHO 2006b), members of the general public often engage in other behavioural changes not promoted by health authorities. For example, we have previously documented that during the SARS crisis, many people avoided those who displayed symptoms of the common cold (e.g. coughing or sneezing), workers in the health-care profession, and those assumed to have a high likelihood of being at risk for SARS by virtue of their nationality or recent travel history (Lee-Baggeley et al. 2004). Avoiding people perceived to be at risk for SARS was unlikely to be effective from a health-care perspective since these attributions were most likely false. A similar strategy that was ineffective in curtailing the spread of HIV in the 1980s, for example, involved avoiding direct touch and contact with gay men (AVERT 2006). When associated with certain groups, the obvious result is racism and discrimination (Leung and Guan 2004).

Coping with the threat of infectious agents and health behaviours

The SARS crisis offered a unique look into public health behaviours during these types of crises. It not only posed significant medical risks but also psychologically impacted individuals to a greater extent that would have been predicted from the morbidity rates and physical impact of SARS. UNESCO (2003) determined that the public's perceived threat, anxiety and panic was unparalleled in recent memory (Cheung 2004). As health researchers, we looked beyond traditional models of health behaviours (see Fishbein et al. 2001), which often do not focus on threats to health as a stressor with which to cope. Models of stress may be useful in understanding reactions to health threats as they suggest a focus on cognitive appraisals of threat and ways of coping with these threats. Importantly, health researchers have begun to ask which coping strategies lead to effective precautionary behaviours that do not disrupt social cohesion (i.e. wearing a mask) compared to those strategies that predict socially and psychologically damaging precautionary behaviours (i.e. avoiding interacting with those who appear to be of Asian descent).

The literature on coping with illness reveals a number of strategies for dealing with health-related stressors (O'Brien and DeLongis 1997) that might usefully be applied to how individuals deal with the fears of an epidemic. These include both avoidant and prosocial coping strategies. One avoidant coping strategy, frequently used in response to the SARS virus, is wishful thinking (Lee-Baggeley et al. 2004). Wishful thinking refers to the individual's attempts to cognitively avoid the situation by wishing or hoping it goes away or is somehow over. One form of prosocial coping receiving attention in the stress literature is empathic responding (O'Brien and

DeLongis 1996). Individuals engaging in empathic responding try to understand what others are experiencing and offer support.

We have found that feeling threatened by SARS during the height of the crisis in 2003 was associated with higher levels of both wishful thinking and empathic responding. Feeling threatened by SARS was also related to engaging in higher levels of a variety of health behaviours – both those recommended by the CDC (i.e. taking health precautions) and those not specifically recommended (i.e. avoiding people). Notably, patterns of coping helped to discriminate between the types of health behaviours in which individuals were engaged. Those who reported a prosocial coping strategy in response to the threat of SARS appeared to use the recommended and effective precautionary health behaviours without engaging in avoidant health behaviours that were associated with significant economic and societal costs. On the other hand, those hoping SARS would simply go away were more likely to avoid people (Lee-Baggley et al. 2004).

The present study

In the present study, we sought to replicate and extend our previous findings to a larger SARS sample and to a sample of respondents (Rs) coping with the threat of WNV. Our initial study was limited to an examination of reactions to the threat of SARS during the period following the outbreak until the end of reported cases. However, the threat of SARS continued months later in people's minds and, unfortunately, because of this perceived threat, the economic and social impact continued as well. Furthermore, we also sought to replicate the findings from our previous study to a health threat that is substantially different in nature and process, namely the WNV. Importantly, WNV is not spread by human contact, and our previous findings regarding psychological reactions to the threat of SARS suggested a maladaptive pattern of avoidance behaviours that might reasonably be assumed to be limited to diseases spread by such contact. We examined ways in which coping was related to two specific health behaviours: taking recommended precautions and avoiding people.

Based on our previous findings of initial reactions to SARS, we expected specific coping strategies to be integral to engaging in specific health behaviours. Wishful thinking, as a coping strategy, is avoidant by nature and therefore, we expected that using this type of strategy to deal with the threat of an infectious agent might be associated with avoidance-type health behaviours. In both the samples included in the present study, we expected higher levels of wishful thinking to be associated with higher reports of avoiding those perceived to be at risk for either infectious agent.

The ability to empathise with others' stressful experiences is integral to prosocial coping. A person engaging in empathic responding during a health crisis might be less likely to consider others as objects to be avoided, but rather as people needing care. Therefore, without the inclination to avoid others, behavioural resources may be more likely to be expended on effective, preventative health behaviours, such as hand washing and mask wearing.

Methods

Data collection

Data from the SARS sample were collected through an online questionnaire linked to a number of websites (for a detailed description of the methodology, see Lee-Baggley et al. 2004).

Participants

SARS sample

Two-hundred and sixty-nine Rs completed the survey between June 2003 and November 2004. The majority were Canadian-born (60%), Canadian-living (63%), under 30 years of age (67%), female (70%), and had 13 or more years of education (81%). Just over half (54%) of the sample was composed of students. Half of the students in the study were from the University of British Columbia, and received course credit for their participation. Ethnicity was not included, due to the difficulties in coming up with a suitable classification system that could be used in a worldwide survey.

West Nile Virus sample

One-hundred and ninety-one Rs were surveyed between the months of September and October of 2003, beginning at the end of the summer and completing in the fall. Ninety-seven percent of the sample resided in Canada, and of those, 60% were Canadian-born. The majority of Rs were under 30 years of age (97%), female (75%), had over 12 years of education (93%) and 90% were students, mainly from the University of British Columbia. The students received course credit for participation. Again, ethnicity was not included.

Procedures

The main questionnaire was jointly developed by The SARS Collaborative Research Group,¹ which included the second and fourth authors. Only those variables related to the current study will be discussed (the health behaviours component, demographic information and the wishful thinking coping item). Other measures (perception of SARS threat, empathic coping items and state anxiety) were added to the questionnaire specifically for use in the study described here. The WNV questionnaire was adapted from the SARS questionnaire. The two studies were conducted independently of each other.

Measures

Threat appraisal

For SARS, Rs were asked to rate the extent to which five statements were true for them at the current moment on a four-point scale, ranging from 'not at all' to 'a great deal'. Item examples included 'I feel nervous about getting SARS' and 'SARS is threatening my health'. A mean score for the four items was calculated. Internal

reliability of the scale was moderate (Cronbach's $\alpha = 0.68$). Higher scores indicated greater perceived threat.

For WNV sample, Rs were asked to rate the extent to which they were 'worried about getting the West Nile Virus yourself' on a five-point scale, ranging from 'not at all worried' to 'very worried'.

State anxiety

The feelings of current anxiety related to SARS were assessed through an updated version of Spielberger et al.'s (1970) measure of state anxiety. Rs were asked to rate their current feelings related to SARS on a four-point scale, ranging from 'not at all' to 'very much so'. Composite scores were computed with 17 items, including such items as 'I feel tense', 'I feel upset', 'I feel nervous'. Internal reliability of the scale was high (Cronbach's $\alpha = 0.94$).

Ways of coping

Coping strategies were measured with the Brief Ways of Coping (BWOC) (Lee-Baggley et al. 2005). Items included in the present study were from the wishful thinking and relationship-focused coping subscales. Instructions to Rs for the coping items were 'To what extent have you managed whatever concerns or fears you might have about ___ in each of the ways listed below?'

For the measure of *wishful thinking*, Rs rated the extent to which they managed concerns or fears about SARS or WNV through 'wishing ___ would go away or somehow be over with' on a four-point scale, ranging from 'not at all' to 'a great deal'. Due to the collaborative nature in the development of the questionnaire, there were limitations on the number of items that could be included and only one item was selected. For *empathic responding*, Rs reported on four items the extent to which they had helped others who might be concerned about getting SARS or WNV on a four-point scale, ranging from 'not at all' to 'a great deal'. Examples included, 'Tried to understand the other person's concerns about ___' and 'Tried to understand how the other person felt about ___'. A mean score was calculated for the four items. Reliability was high and consistent with past research (Cronbach's $\alpha = 0.93$) (O'Brien and DeLongis 1996).

Health behaviours

The present study examined two types of health behaviours, *avoiding people* and *taking recommended health precautions*.

The instruction to Rs for the *Recommended Health Precautions Scale* was, 'To avoid getting ____, I have personally ...'. For SARS, the list contained the following items: wearing a mask, washing hands more often, taking more care about cleanliness, using disinfectants, eating a balanced diet, exercising regularly and making sure they got sufficient sleep. Reliability of the scale was moderately high ($\alpha = 0.83$). For the WNV sample, Rs selected from a list of seven items (CDC 2006b), including using 'bug spray', avoiding being outdoors between dusk and dawn, using mosquito/insect repellent, emptying pools of standing water, avoiding

wearing dark coloured clothing, wearing light coloured clothing, and wearing more clothes outdoors. The reliability of the scale was moderate (Cronbach's alpha = 0.69).

For the *Avoidance Scale*, Rs were asked to rate, 'How likely are you to avoid the following people?' Rs were asked to indicate, using a five-point scale ranging from 'very unlikely' to 'very likely', the extent to which they avoided people who might be perceived as having a higher risk of having been exposed to the SARS virus or WNV. For the SARS sample, 10 items were included: a person you know has just come from an area infected with SARS, a person who has a fever, a person who sneezes, a person who looks unwell, a health-care worker, a person who is coughing, a person who you think might possibly be from an area infected with SARS, a person who has a family member who has come down with SARS, a stranger wearing a surgical/hygiene mask, and a stranger not wearing a surgical/hygiene mask. The final scale consisted of the sum of the checked alternatives. Reliability of the scale was high (Cronbach's alpha = 0.92). For the WNV sample, seven items were included: a person you know has just come from an area infected with WNV, a person who has a family member who has come down with WNV, a person who has a fever, a person who sneezes, a person who looks unwell, a health-care worker and a person who is coughing. The final scale consisted of the sum of the checked alternatives. The reliability of the scale was high (Cronbach's alpha = 0.90).

Results

Descriptive statistics and zero-order correlations

Means and standard deviations for the variables in both the SARS and West Nile samples are shown in Table 1. For both samples, perception of threat, coping (empathic responding and wishful thinking) and health behaviours were all positively related to one another. Individuals higher in threat perception were more likely to report employing both modes of coping and engaging in greater health behaviours.

Multivariate analyses

Table 2 summarises the results of two linear regression analyses for the SARS sample. As seen in Table 2, empathic responding and perception of SARS threat² were significantly, independently and positively associated with taking recommended

Table 1. Means and standard deviations for SARS and West Nile samples.

	SARS sample		West Nile sample	
	Mean (N)	SD	Mean (N)	SD
1. State anxiety	37.07 (242)	10.67	–	–
2. Perceived threat	1.86 (246)	0.63	2.04 (191)	1.13
3. Empathic responding	2.39 (245)	0.90	1.79 (191)	0.77
4. Wishful thinking	3.11 (255)	1.49	2.74 (191)	1.44
5. Taking health precautions	2.08 (267)	2.26	1.52 (191)	1.52
6. Avoiding people	24.59 (267)	10.30	16.23 (191)	6.23

Table 2. Linear Regression models for SARS- and West Nile-related health behaviours (taking health precautions and avoiding people) as a result of time of participation, perceived threat, state anxiety and coping.

	SARS sample (<i>N</i> = 238)				West Nile sample (<i>N</i> = 190)			
	Taking health precautions		Avoiding people		Taking health precautions		Avoiding people	
	B	SE B	B	SE B	B	SE B	B	SE B
Main effects								
Time of participation	0.04	0.04	0.07	0.14	–	–	–	–
State anxiety	0.02	0.02	0.26***	0.06	–	–	–	–
Perceived threat	0.94***	0.24	3.56***	0.96	0.46***	0.09	1.02**	0.40
Empathic responding	0.71***	0.15	0.08	0.60	0.37**	0.14	0.33	0.60
Wishful thinking	–0.02	0.09	1.36***	0.35	0.08	0.07	0.59†	0.32
R ²	0.26***		0.34***		0.19**		0.07*	
TimeXcoping interaction effects								
TimeXempathic responding	–0.00	0.04	0.38*	0.16	–	–	–	–
TimeXwishful thinking	–0.04	0.02	–0.12	0.10	–	–	–	–
R ² Δ	0.02		0.02*		–		–	

p* ≤ 0.05; *p* ≤ 0.01; ****p* ≤ 0.001; †*p* ≤ .06.

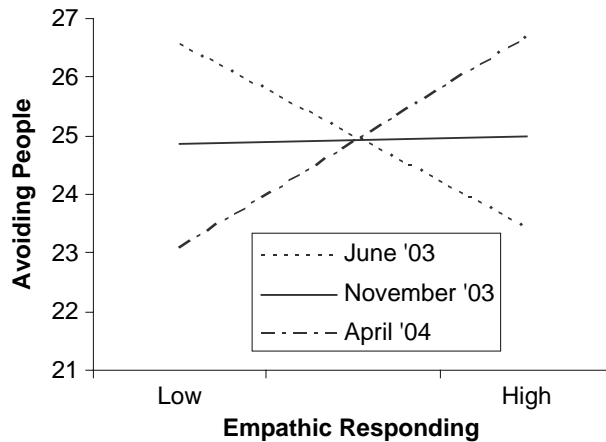


Figure 1. Interaction between time of participation in the study and empathic responding predicting avoiding people in SARS sample. The interaction was significant at $p \leq 0.05$.

health precautions. The likelihood of avoiding people was predicted by SARS anxiety, perceptions of threat, wishful thinking and the interaction between time of participation³ and empathic responding. The time of participation was considered a continuous variable from first month (June 2003) of the study until month 18 (November 2004). As can be seen in Figure 1, during the peak period of the SARS crisis (labelled June 2003), increases in empathic responding were related to lower levels of reporting 'avoiding people' as a way of responding to the threat of SARS at a 0.07 level of significance ($B = -1.75$, $t(230) = -1.81$). Conversely, soon after the peak period (labelled November 2003), levels of empathic responding were unrelated to higher levels of avoiding people ($B = 0.07$, $t(230) = 0.13$, $p > 0.50$). Finally, months after the last reports of SARS cases (labelled April 2004), higher levels of empathic responding were positively related to avoiding people ($B = 2.02$, $t(230) = 1.97$, $p < 0.05$).⁴

Table 2 also shows the results of two linear regression analyses for the West Nile sample. The analyses examined the relationship between perceived threat and coping to taking health precautions and avoiding people. Perception of threat and empathic responding were significantly, independently and positively associated with taking recommended health precautions. Finally, threat perception was significantly and positively associated with avoiding people, even after controlling for coping. Wishful thinking marginally ($p < 0.06$) predicted avoiding people.⁵

Discussion

Our previous research (Lee-Baggeley et al. 2004) highlighted the roles of wishful thinking and empathic responding in coping with the threat of infectious disease during the peak of the SARS crisis. In the present study, we sought to examine whether our previous findings would: (a) extend to a time period of the SARS crisis that was beyond the initial onset of the crisis, and (b) extend to other global health threats that were not spread by human contact, specifically the threat of WNV. We investigated the impact of these two significantly different types of global viral

outbreaks, namely SARS and WNV, on perceptions of health threat and how individuals responded to these threats. Our findings suggest that greater perceptions of health threat are associated with higher levels of coping responses and a variety of health behaviours aimed at reducing the threat of West Nile or SARS. More importantly, our findings suggest that specific coping responses are associated with specific health behaviours and that these associations are potentially dependent on the proximity to the peak in reported cases.

Empathic responding and health behaviours

In the present study, similar to our previous findings (Lee-Baggley et al. 2004), individuals who engaged in empathic responding were more likely to engage in health behaviours that were recommended by the CDC (2006a, 2006b) and WHO (2006a). The present study also found that individuals engaging in empathic responding, in order to help others deal with the threat of SARS during its peak period, were less likely to avoid people perceived to be at risk. These individuals were, therefore, not engaging in behaviours likely to be socially and economically damaging. Our findings suggest that when people cope with their fears of a potentially deadly disease by focusing their concerns on the needs of others, they are more likely to engage in health precautions that are effective and recommended, and are less likely to avoid potentially problematic responses. Consequently, major economic and social damage may be circumvented. These findings are consistent with the larger literature on prosocial behaviour. Empathy and perspective taking are well documented to lead to effective social functioning, and to benefit both the recipients of such behaviours and the larger society (Batson 1998, Oswald 2002, Penner et al. 2004). Prosocial behaviours may hinder a more automatic, and somewhat more destructive, response in the face of a global viral threat.

On the other hand, when the threat of viral infection is low – either in the early months following the end of reported SARS cases, or at the end of the summer/beginning of fall, as seen in our West Nile analyses – our findings suggest that empathic responding is unrelated to avoiding people. Empathic responding may, thus, be beneficial in hindering damaging behaviours only during the peak of a health crisis. Finally, our findings suggest that months after a public crisis, empathic responding may, in fact, be related to increases in maladaptive behaviours. These findings, while unexpected, may be a result of who is completing the questionnaire many months after the threat is over. Those volunteering to complete a survey on SARS at a time when no cases are being reported may be more anxious by nature and therefore, report higher levels of all coping strategies and higher levels of all types of precautionary behaviours. Future investigation should evaluate the personality of individuals and how individuals cope with the threat of a transmittable infection during its entire course, at times when cases are heavily reported and at times when no media attention is being paid to it. Such investigations may delineate the roles that individual differences versus coping strategies play in predicting coping and health behaviours.

Wishful thinking and health behaviours

Our results indicate that individuals who reported engaging in wishful thinking to cope with the threat of SARS or West Nile were more likely to engage in avoiding individuals perceived to be at risk for the viruses. In addition, individuals reporting wishful thinking were no more or less likely to report engaging in recommended health precautions, for either viral infection. In other words, it is possible that avoidant types of coping, including wishful thinking, may predict more extreme and potentially dysfunctional behaviours without promoting the recommended precautions necessary to effectively respond to threats to health. Our findings are consistent with previous research on HIV. Kalichman et al. (2006) demonstrated in a sample of HIV-positive individuals that avoidant coping may lead to receiving misinformation about illness, increased vulnerability to unfounded claims and may result in poorer adjustment to the illness.

Future directions

In the present study, we examined wishful thinking and empathic responding as possible avoidant and prosocial responses to distress that may predict distinct forms of behavioural responses to the threat of two global viral infections that are significantly different in nature and history, SARS and WNV. Our results indicate that coping strategies are associated with engaging in health behaviours in response to health threats. Future research should expand the ways of coping investigated, and should attempt to investigate the potential effectiveness of promoting effective coping and decreasing maladaptive strategies in response to future health threats.

A limitation in the present study is that the data are cross-sectional, not permitting the examination of changes in individuals' responses across time. In addition, our West Nile sample was collected during the months following the peak infection rates of the virus. Future research with longitudinal data is needed to investigate whether the ongoing reports of viral threats, during different periods of risk levels, lead to changes in people's perceived threats, which may in turn predict changes in coping and behaviours. Additionally, both the SARS and West Nile data were partly collected via the internet, using self-report measures. Given this, the data are subject to the biases and limitations of self-reports, in addition to the disadvantages presented by internet designs (Rhodes et al. 2003, Tourangeau 2004). First, as in this study, samples are most often self-selected in web-based surveys. Furthermore, internet users have tended to be younger, wealthier and more educated than non-users (Lenert and Skoczen 2002), as reflected in our study, leading to what has been called, the 'digital divide' (National Telecommunications and Information Administration 1999). Recent evidence, however, suggests that this digital divide is narrowing, as more people from diverse socio-economic status groups gain access to the internet (Rhodes et al. 2003). In addition, the validity of internet-based data collection is an important question. However, studies comparing data collected in traditional formats, such as pencil-and-paper (Schwarzer et al. 1999) and telephone survey (Chang 2002), have found that internet studies have high validity and yield similar results to more traditional data collection methods.

Finally, despite examining the role of demographic factors and failing to find significant differences, our samples reflect a well-educated, young and female

population, mostly residing in Canada. In addition, our samples are disproportionately students. Given the international impact of infectious agents, future research should examine a broader sample to see the extent to which the results identified in the present study generalise to other populations. Understanding cultural and geographic differences in coping strategies and health behaviours may facilitate designing more effective health promotion campaigns and media messages, focusing on those messages with wider applicability across divergent groups (Tweed and DeLongis 2006).

Conclusion

The present study highlights the importance of considering specific coping strategies in managing health threats and in promoting and discouraging different health behaviours. While we are not suggesting a comprehensive model to explain health behaviours in response to infectious agents, we believe that our results expand the understanding of why some individuals engage in specific behaviours. Over the past few years, we are often reminded about the threats to our health by infectious agents, the most notable of late being Avian Influenza. The global threat presented by Avian Flu and the resulting ways in which individuals might in the future manage these threats can be well informed by the present study. Our findings suggest ways of coping which might usefully be encouraged via mass media campaigns. Understanding the psychological and behavioural reactions to previous global threats, such as SARS and West Nile, may inform our health messages, and inspire more effective and productive campaigns intended to reduce the damaging consequences such diseases can have on the well-being of society.

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Notes

1. SARS Collaborative Research Group was assembled by George Bishop, with assistance from the American Psychological Society, Division 38 of the American Psychological Association and the Society of Behavioural Medicine. For a list of its members, please see Lee-Bagglely *et al.* (2004).
2. While state anxiety may also be viewed as a dependent variable, the current study sought to examine health behaviours as the outcome variable. Given this goal, state anxiety was controlled for in the analyses for SARS to ensure that the relationships observed between coping and health behaviours were not simply due to their shared variance with general state anxiety.
3. We controlled for time of participation in the study since we included in our analyses Rs who completed the study while reports of the outbreak were still occurring, and up to a year after the major outbreak period. We were interested in whether any coping strategies had varied associations with behaviours depending on the time of participation and thus, examined interactions of time of participation with coping.
4. All Variables were centred in our regression equations. The centre of our time of participation was November 2003 (the mean approximated month six of our data), which represents the period soon after the peak of the crisis. Furthermore, we began collecting

data in June 2003, month one of our sample, which corresponds to the peak of the SARS crisis. In order to calculate the B coefficient for the direct effect of empathic responding on avoiding people for the peak period and for seven months after the peak period (April 2004), we followed the instructions of Cohen *et al.* (2003).

5. State anxiety was included as a control variable in the SARS analyses. However, given that this control variable did not alter the pattern of results, and that it was closely related to perceptions of threat, we excluded it from further analysis.

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