Eberhard Karls Universität Tübingen

Seminar für Sprachwissenschaft

# Metaphors and Reliability in Reasoning

Research Apprenticeship

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Miriam Schiele

Matriculation number: 6098290

Supervised by

Prof. Dr. Michael Franke

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Abstract

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1. Introduction

Metaphors can be found in everyday speech. Their persuasive nature has been object of studies since the last 1970s (cf. Gibbs 2010). For instance, Thibodeau & Boroditsky (2011) researched how even subtle metaphors impact decision-making regarding a socio-political issue, namely crime. In their study, they explored how metaphorically framing crime as a *beast* or a *virus* influences the suggestions offered by the participants to solve the issue. That is, when crime was metaphorically described as a *beast*, participants were more likely to suggest enforcement-oriented solutions to the issue than when crime was metaphorically framed as a *virus*.

So far, however, little research has been conducted regarding the question whether the reliability of the speaker influences the effect of the metaphor. Hence, the present study replicates the study conducted by Thibodeau & Boroditsky (2011). The first hypothesis, therefore, is that metaphorically framing crime as a *beast* triggers participants to prefer enforcement-oriented solutions and describing crime as a *virus* influences participants to favor reform-oriented solutions.

In addition, a follow-up study aims to test whether the reliability of the speaker describing the issue influences the effect of the metaphor. Unlike in the replication study, the participants are not only presented with a metaphorical description of the crime issue but also with pictures of different speakers that are associated with different levels of reliability, namely a newscaster and an alcoholic. The second hypothesis, therefore, holds that the effects of both the *beast* and the *virus* frame are higher if the speaker describing the crime issue seems reliable.

The paper is subdivided as follows. Chapter 2 outlines the research in the field of metaphors in reasoning. Chapter 3 focuses on the study design, including the pilot study, the replication study, and the follow-up study. In chapter 4, I will present the results and in chapter 5, I will discuss the findings. Finally, chapter 6 provides a summary of the study as well as an answer to the research question.

2. Literary review

In the following section, I will outline the research in the field of metaphors in reasoning. First, the scientific background of metaphors is explained, including the conditions under which metaphors are most influential. Second, I will summarize the study by Thibodeau & Boroditsky (2011) on metaphors in reasoning and discuss their results. Next, follow-up studies that could replicate the results by Thibodeau & Boroditsky (2011) as well as their further findings are recapitulated. Finally, I will present studies that could not replicate the findings and discuss their results.

Generally, metaphors can be described as "instances of non-literal language that involve some kind of [implicit] comparison or identification" (Knowles & Moon, 2005, p. 7). According to the conceptual metaphor theory, people speak and think in metaphors (cf. Thibodeau & Flusberg, in press). Consequently, recent studies have focused under which conditions and the degree to which metaphors can influence one's thoughts and decisions about socio-political topics such as crime (cf. Thibodeau, Hendricks & Boroditsky, 2017, Thibodeau, Matlock & Flusberg, 2019, Steen, Reijnierse & Burgers 2014, Thibodeau & Flusberg, in press, Reijnierse et al., 2015).

For metaphors to have their greatest impact, several factors must be aligned. First, the source domain (e. g. *virus* or *beast*) and target domains (e. g. *crime*) must match for the metaphor to be apt. Second, people must not already have strong beliefs about the topic in question. Third, prior knowledge of the topic as well as knowledge and interest in the source domain is useful for the metaphor to be persuading. Next, the entailment of metaphors also depends on factors other than the source domain. That is, the meaning of common metaphors might vary. Finally, metaphors are more influential, if the metaphorical mapping is extended in ways that align with the metaphor. For instance, if the language used to describe the metaphor align with the mapping, people more likely to favor the metaphor-consistent response (cf. Thibodeau, Hendricks & Boroditsky, 2016).

However, little research has been conducted so far regarding the question on the influence of the speaker of the metaphor. That is, whether the reliability of the speaker corelates with the extent to which the metaphor

is influential. For instance, if the speaker seems less reliable, the hearer is less susceptible to the metaphor.

In the original study that is to be replicated in the present paper, Thibodeau & Boroditsky (2011) found that metaphors can heavily influence reasoning. In their first experiment, 485 participants were given a short metaphorically framed report about increasing crime rates in the fictitious City of Addison, which included crime statistics of said city. For half of the participants, crime was described as *virus* infecting the city, while for the other half, as a *beast* attacking the city. Afterwards, participants were asked to propose solutions for the crime problem. Participants that were confronted with the metaphor of crime as a *virus* were more likely to propose dealing with the underlying problem and suggesting reforms to prevent crimes. Contrary, metaphorically framing crime as a *beast* led participants to focus on police force or other methods of law enforcement. Interestingly, participants identified the crime statistics in the report as the motivation for their problem-solving decision instead of the metaphor, although the crime statistics were identical in both vignettes. Thus, metaphors seem to subconsciously influence the participants' decisions. Additionally, their results suggest that overall, Republicans are more likely to propose enforcement solutions.

In a replication study, Thibodeau & Boroditsky (2013) asked participants to evaluate a set of problem-solving solutions for the crime problem and select the most effective ones. The results were consistent with those of the original study. Similarly, Thibodeau & Boroditsky (2015), Thibodeau, Iyiewaure & Boroditsky (2015), and Thibodeau (2016) could replicate the findings. However, Thibodeau & Boroditsky (2015) found indications of a cultural shift in the opinion on the topic of crime. That is, participants' suggestions in their study in 2015 were focused on community outreach, while in the original study in 2011, they proposed "policies grounded in the economy and prison system" (p. 11). Additionally, neighborhood watches were no longer seen as reform-oriented and consistent with the *beast* frame, as it was the case in 2011, but were seen as enforce-oriented instead (cf. Thibodeau & Boroditsky, 2015). Moreover, their results suggest that metaphors are more influential if the metaphoric framing is extended into the

texts of policies. That is, participants were more likely to suggest social reforms that were labelled as *treatments* in response to a crime *virus*, while they favored *attacking* the problem with tough enforcement in response to a crime *beast* (cf. Thibodeau, 2016). As in the original study, results of both replication studies showed Republicans, overall, were more likely to be enforcement-oriented (cf. Thibodeau & Boroditsky, 2015, Thibodeau, 2016).

Likewise, Christmann & Göhring (2016) could replicate the findings as well. However, the participants were Germans instead of US citizens, as it was the case in the original study by Thibodeau & Boroditsky (2011). This might have led to different results, since "the use and evaluation of specific metaphors can vary across cultures" (Steen, Reijnierse & Burgers, 2014, p. 7). Additionally, the coding of the answers differed, insofar as that answers that included an equal number of suggestions for enforcement and reform were not counted to either enforcement or reform, respectively, by 0.5, as it was the case in Thibodeau & Boroditsky (2011) but were coded as 0 instead (cf. Christmann & Göhring 2016). Interestingly, when conducting the coding in the same way as in the original study, the difference between the responses of the *beast* and the *virus* group was not statistically significant (cf. ibid.).

The following two studies by Steen, Reijnierse & Burgers (2014) and Reijnierse et al. (2015) could not replicate the findings of the original study either. The results by Steen, Reijnierse & Burgers (2014) failed to show statistically significant differences between the metaphorically frames but suggested that enforcement solutions are preferred overall. However, as pointed out by Thibodeau & Boroditsky (2015), the coding of the answer differed from the original study in a way that is psychologically and statistically problematic. Moreover, only their fourth experiment included a sufficient sample. According to Thibodeau & Boroditsky (ibid.), it would be more appropriate to treat the data as categorial. In their categorical data analysis, they found that participants of the *virus* group favored reform-oriented options that are consistent with the *virus* frame (cf. Thibodeau & Boroditsky, 2015).

Furthermore, in their series of replication studies, Reijnierse et al. (2015) could not find similar evidence as in the original study by Thibodeau

& Boroditsky (2011). That is, they found no significant effect for the metaphorical framing on the preferred measures (cf. Reijnierse et al., 2015). However, instead of suggestion solutions, participants were asked to evaluate the effectiveness of two sets of measures on a scale and the presented text of the crime problem severely differed from the one in the original study. Not only did they include the mayor of the city as speaker but also information about the longevity of the crime issue, the length of the report, and the content of the report itself differed. That is, the report did not include statistical information and read *Crime is a virus/beast* instead of *Crime is a virus infecting the city/wild beast preying on the city*, as it was the case in the original study. The authors admitted that the design of the study was inappropriate in such a way that it "may have made it impossible to find out whether people actually reason by working out the entailments of the metaphorical frame" (Reijnierse et al., 2015, p. 260). Yet, as in the original study, the effect that Republicans, overall, were significantly more likely to find the enforcement-oriented approaches more effective than Democrats and Independents could be replicated (cf. Reijnierse, 2015).

## 3. Replication study

In the following section provides an overview of the replication study. The study design, including the pilot study, procedure, materials, and methods of data analysis, is explained. Next, socio-demographic information about participants and the results of the study are given.

### 3.1 Study design

The experiment was conducted using a 2 (metaphorical frame: *beast* or *virus*) x 2 (vignette length: short or long) between-subjects design. The four options of the metaphorically framed description of crime are given in the appendix.

After a welcoming page, participants were randomly presented with one of the four possible, metaphorically framed crime descriptions about crime in the City of Addison. While the description was still visible on the screen, participants were asked to propose solutions for the crime problem in a text box. Next, they were asked to rate the reliability of the text on a

scale from 1 to 7. Finally, they were asked to indicate their political affiliation, age, education, gender, nationality, native language, and level of education. During the experiment, participants were not able to return to the pages they had already visited in the survey and update their responses. The code for the study can be found here: https://tinyurl.com/mr4vky58.

Participants' solutions were treated as a set of suggestions. Each suggestion is classified as either *enforce* or *reform* by hand. As in the original study by Thibodeau & Boroditsky (2011), suggestions are categorized as *reform* if the proposed solution suggests investigating the underlying cause of the problem or suggests a particular social reform to treat or inoculate the community. In contrast, suggestions are categorized as *enforce* if the proposed solution focuses on the police force or other methods of law enforcement or modifying the criminal justice system. As pointed out by Thibodeau & Boroditsky (2015), suggestions of *neighborhood watches* cannot be clearly classified and are therefore excluded from the analysis. Solutions that contain the same number of suggestions for both reform and enforce are categorized as *both*. Finally, solutions are categorized as *neither* if the proposed solution lacked a suggestion and are therefore excluded from the analysis. Participants' answers and their categorizations are given in the appendix. The remaining three categories are ordered as follows: *reform*, *both*, *enforce*.

As preregistered at https://osf.io/2tbj5/, data were analyzed using a Bayesian ordinal regression model for the binary choice variable `metaphor` as covariate (either *beast* or *virus*). The analysis uses the statistical programming language R and relies on the `brms` package. In the analysis, the default (flat) priors of the `brms` package for the effect coefficients are used. The code for the analysis can be found here: https://tinyurl.com/yczvyjy3.

The preregistered study design is based on a pilot study that was completed by a total of 60 participants. Participants' answers as well as the findings of the pilot study can be found in the appendix.

As preregistered, we hypothesized that compared to the *virus* metaphor, we expect a higher propensity of suggestion in the category *enforce* in the *beast* frame, by comparing the posterior estimates for the aggregate value in the *beast* condition with those from the *virus* condition. We judge

there to be positive evidence in favor of the main hypothesis (1) if the posterior probability of the difference between the ordinal predictor value for the *beast* metaphor and the *virus* metaphor being positive (*beast* bigger than *virus*) is at least 0.95.

Furthermore, the study aims to test the hypothesis (2) that rates of *enforce* increase for participants that identify their political affiliation as Republican. As preregistered, we judge there to be evidence in favor of the hypothesis, if the posterior probability of this difference being bigger than zero is at least 0.95. We intend to also investigate the hypothesis (3) that the effect of metaphors on reasoning, as proposed in hypothesis (1), does not vary with the length of the metaphorically framed description of crime. In accordance with the preregistration, we judge there to be evidence in favor of the hypothesis, if the posterior probability of this difference not being bigger than zero is at least 0.95.

## 3.2 Participants

The data used in this study was taken form Prolific (www.prolific.co/). To ensure high-quality work, the approval rate on Prolific was set to 95%. During the set-up of the study, it was ensured that only participants who self-identified as native English speakers based in the US were recruited. Every participant was allowed to participate only once and was paid for their participation.

A total of 200 participants (92 females, 102 males, 3 other) completed the study. Their ages range from 18 to 85[1] with a mean of 38.9. A total of 65 participants (32.5%) completed high school as their highest level of education, while 2 (1%) participants did not graduate from high school. 96 participants (48%) reported college as their highest education, and 33 participants (16.5%) had a higher degree. A total of 108 (54%) participants described themselves as Democrats, 33 (16.5%) as Republicans, while 56 (28%) identified as neither and 3 participants (1.5%) preferred not to say. The full data set can be found here https://tinyurl.com/46ytp2z4. However,

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[1] One participant reported an age of 1850. Since this outlier must be a typing error, it is excluded. Therefore, the second highest value is given here as the highest age and the mean value of age is calculated without the outlier.

because only 3 participants out of 200 participants preferred not to state their political affiliation, we excluded those participants from the analysis to conduct a reliable statistical analysis.

3.3 Findings

The aim of the replication study was to test whether metaphorically framing crime as a *beast* triggers participants to prefer enforcement-oriented solutions and describing crime as a *virus* influences participants to favor reform-oriented solutions, as has been claimed by Thibodeau & Boroditsky (2011). Additionally, the replication study explores the influence of the vignette length on the perceived reliability. Since the follow-up study tests the hypothesis that the effects of both the *beast* and the *virus* frame are higher if the speaker describing the crime issue seems reliable, it is crucial to ensure that it is not the vignette length but the perceived reliability of the speaker that amplifies such effects.

First, consider Figure 1, in which the participants' responses to the crime issue are depicted. It becomes apparent that enforcement-oriented solutions are preferred overall.
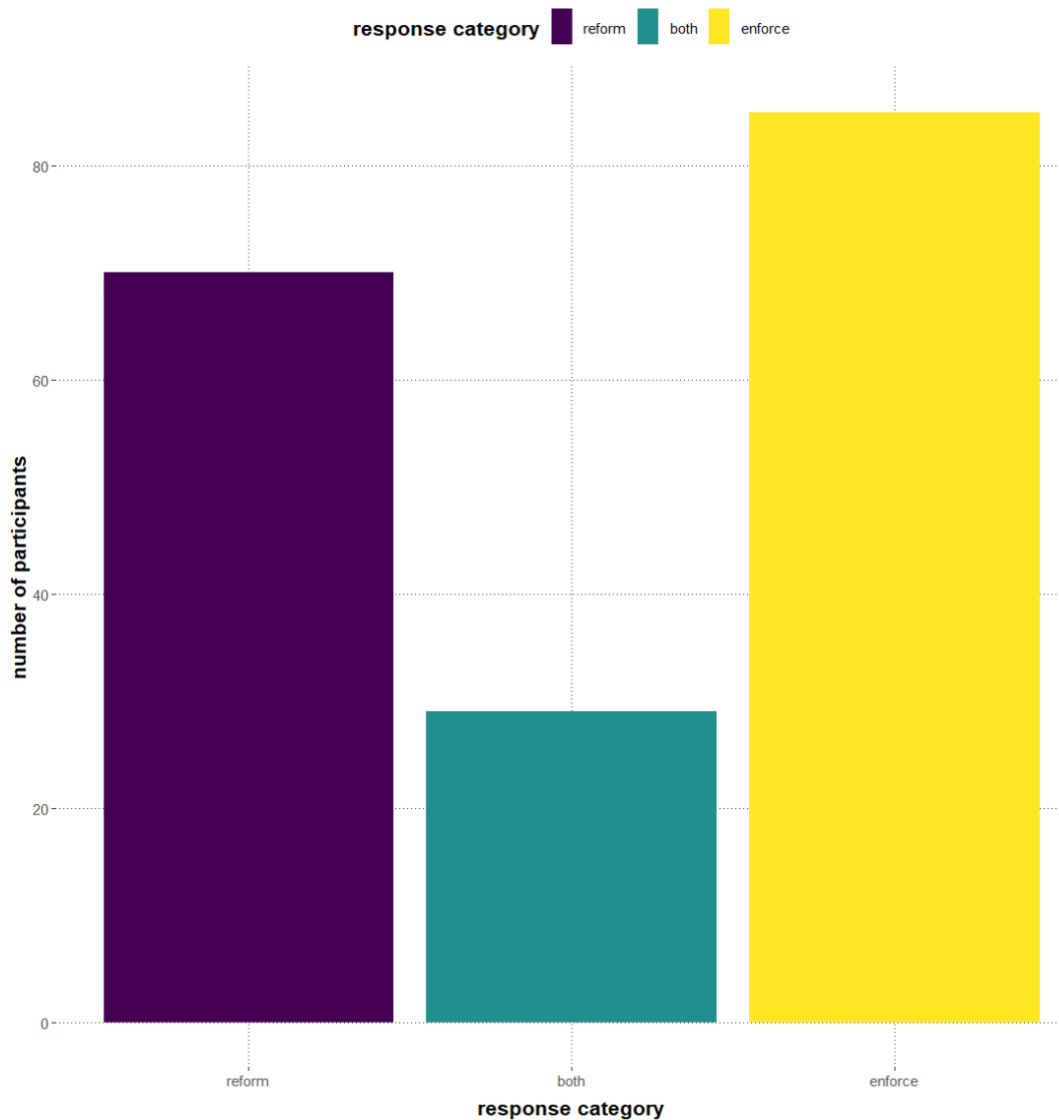
**Figure 1:** Categorizing participants' responses reveals that enforcement-oriented solutions are preferred overall.

Next, consider Figure 2, which presents the same data but differentiates between political affiliations and the metaphorical framing of the description. Considered jointly, it becomes apparent that on the one hand, Republican mostly suggest enforcement-oriented solutions overall and on the other hand, metaphorically framing crime as a *virus* leads participants to favor reform-oriented solutions.
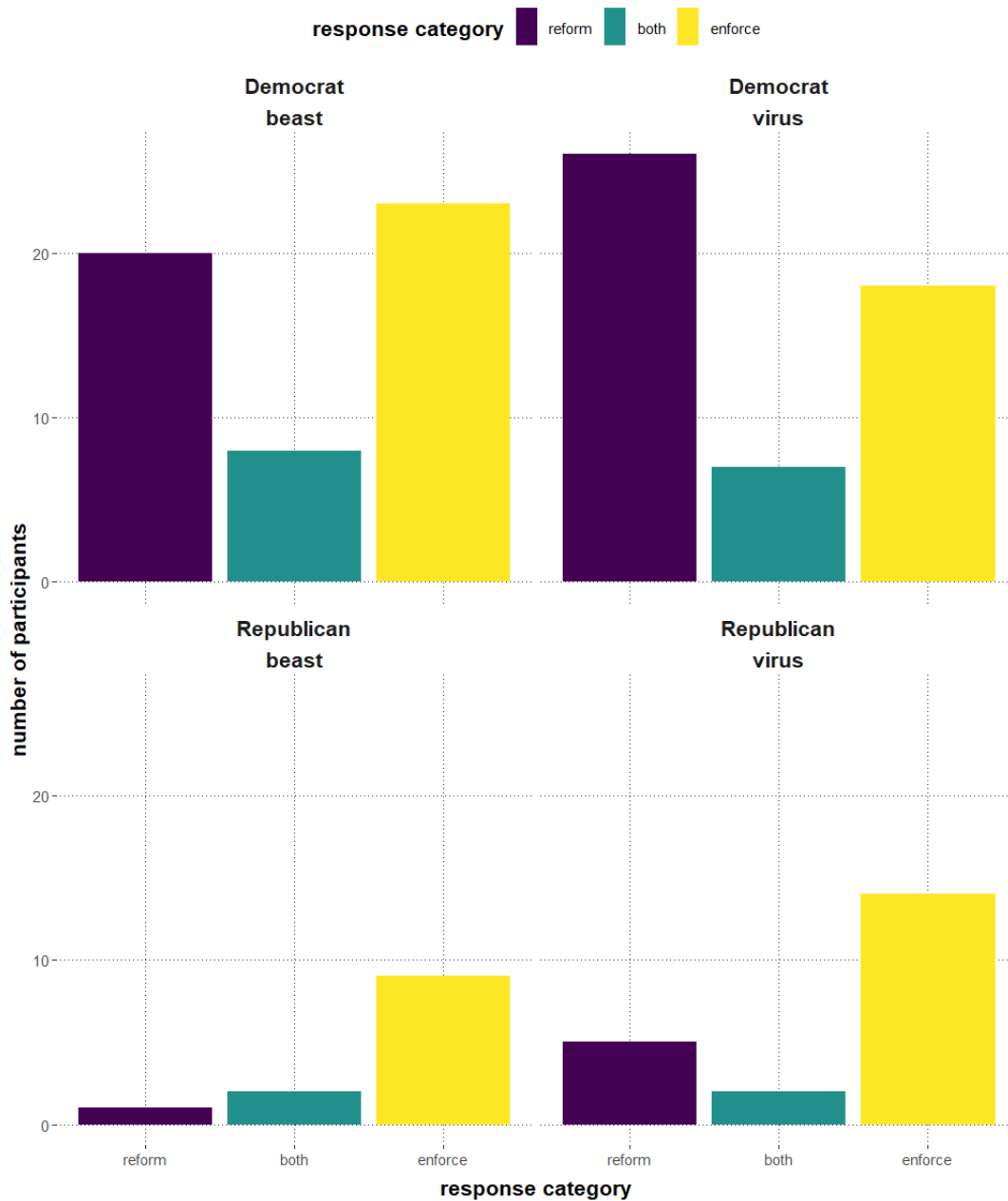
**Figure 2:** Participants' responses are influenced by the metaphorical framing of the description as well as their political affiliations.

As preregistered, we hypothesized that compared to the *virus* metaphor, we expect a higher propensity of suggestion in the category *enforce* in the *beast* frame, using Bayesian ordinal regression. We judge there to be positive evidence in favor of the main hypothesis if the posterior probability of the difference between the ordinal predictor value for the *beast* metaphor and the *virus* metaphor being positive (*beast* bigger than *virus*) is at least 0.95. However, the results of the replication study fail to reach the required threshold, as the posterior probability is 0.67. Hence, the probability of hypothesis (1),

given our model and data, is less than 0.95 and therefore insufficient to support the hypothesis.

Regarding the hypothesis (2) that investigates whether the rates of *enforce* increase for participants that identify their political affiliation as Republican, the results of the original study could be replicated. That is, as preregistered, we judge there to be evidence in favor of the hypothesis, if the posterior probability of this difference being bigger than zero is at least 0.95. The results revealed that the posterior probability is 0.99. Therefore, the results replicate the findings of the original study in this aspect.

Last, consider Figure 3, in which the influence of the vignette length on the perceived reliability is visualized. The mean values of the perceived reliabilities $r$ are almost similar in both groups ($r = 4.8$ in the long vignette condition and $r = 5.1$ in the short vignette condition), although the results reveal that the variation is rather high ($\sigma = 1.5$ and $\sigma = 1.3$, respectively).
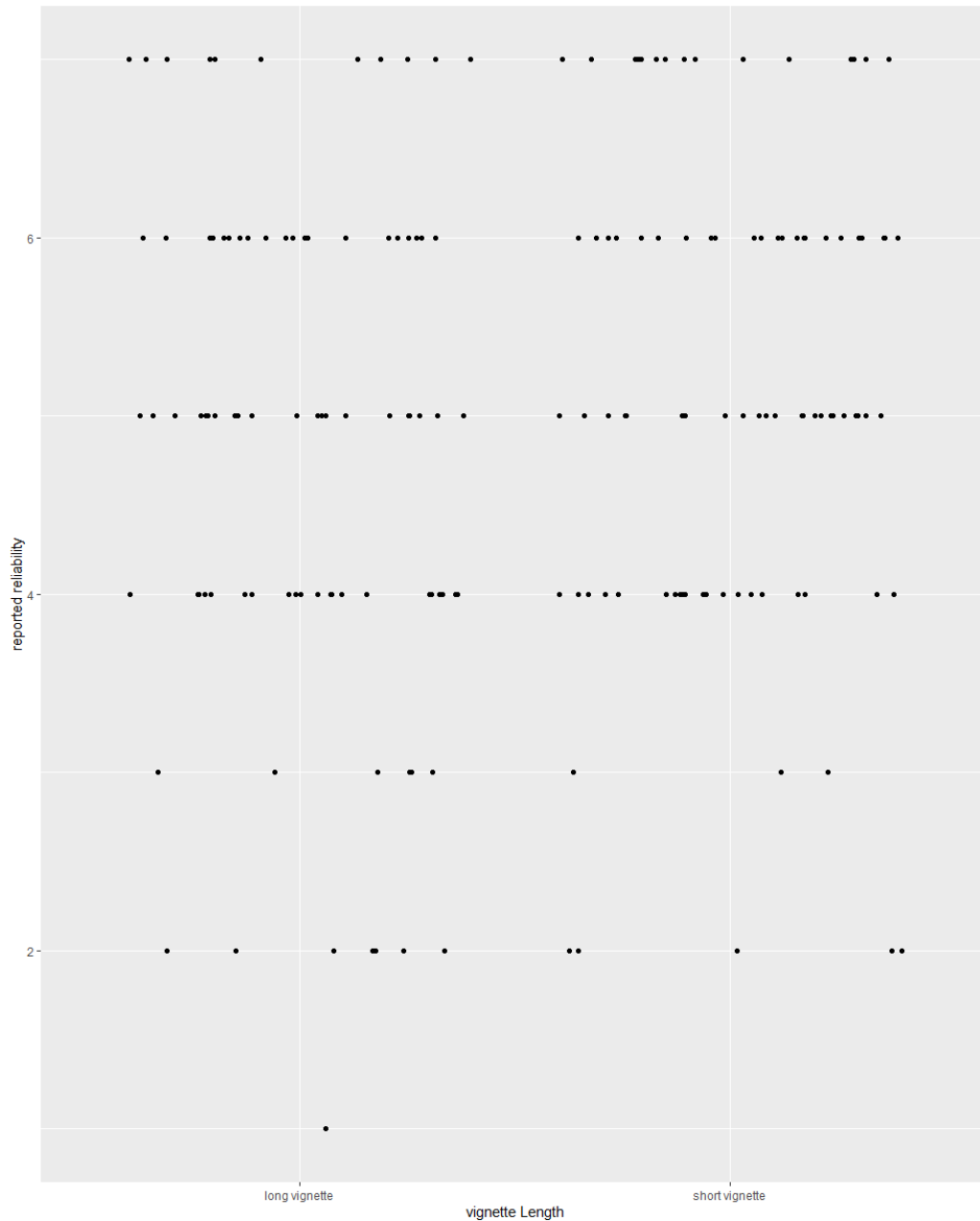
**Figure 3:** Plotting reliability against vignette length reveals hardly any influence of vignette length on perceived reliability.

As preregistered, we hypothesized that the effect of metaphors on reasoning, as proposed in hypothesis (1), does not vary with the length of the metaphorically framed description of crime. We judge there to be evidence against the hypothesis, that is, evidence in favor of a correlation between vignette length and the effect of metaphors on reasoning, if the posterior probability of the difference in vignette length being bigger than zero is at least 0.95. The results reveal that the posterior probability is about 0.82. Thus, there does not seem to be a correlation between vignette length and

the effect of metaphors on reasoning. Therefore, it can be assumed that the results support hypothesis (3).

4. Follow-up study
*To be inserted here*

4.1 Study design
*To be inserted here*

4.2 Findings
*To be inserted here*

5. Discussion
*To be inserted here*

6. Conclusions
*To be inserted here*

7. Bibliography

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## 8. Appendix

### 8.1 Pilot study: Categorizing of responses

| category | response |
|---|---|
| both | Identify and reduce the factors that make people turn to crime. Increase social services. Unless this city is in the US, then we need to spend even more money on police and make sure every citizen over the age of both is armed at ALL times. |
| enforce | police force |
| enforce | Fund the police more |
| enforce | Addison needs to implement a system where the police are connected with the community.  They can introduce a heavy but welcomed presence due to the relationships their force builds within the community. This will produce more visibility of law enforcement as well as a want to share information leading to a reduction in crime. |
| both | More uncorrupt police and better social education policies |
| both | In my opinion, the city of Addison needs to involve its residents in helping tackle the problem of increasing violent crime. It needs to recruit citizen volunteers to help its police force out, by forming neighborhood vigilance, watch groups, etc. to try to get back control of the situation. The city can also invest in initiatives for youth training, providing employment opportunities, etc. to deter would-be criminals by giving them a purpose in life. |
| reform | Institute neighborhood events/community building; build rapport between police and citizens |
| enforce | more police |
| enforce | Organize the citizens into a Crime Watch.  Publicize types of crimes and how to avoid situations.  Determine who is doing the crimes and locking them up. |
| both | They need to introduce more policing and focus on community policing. They need to build up mental health centers and introduce more employment opportunities. |

| reform | Addison needs to figure out what has caused the crime rate to increase in the past three years. The city needs to devote more resources to this problem. |
|---|---|
| enforce | it would depend on a myriad of factors but i supose a quick fix would be a redoing of the potrol system and get more cops |
| enforce | more police |
| reform | Citizens band together |
| enforce | Ensuring that the citizens of Addison are armed and know how to use their firearms would greatly reduce the crime rate. Criminals are bullies and they will not attack if they think their prey is armed and can fight back. |
| enforce | Increase security measures |
| enforce | There needs to be more police presence in neighborhoods with high crime. The city needs to spend more time investigating the crimes and putting those people away, since it is likely that the crimes are being committed by a small group of people. |
| reform | Find out the reason why there is crime and then come up with a solution to that problem. |
| enforce | Flood the streets with police. |
| enforce | More patrolling by police officers and security personnel. |
| enforce | Stricter enforcement and longer sentences will serve as a good deterrent to crime. |
| enforce | Addison needs to add more officers to patrol the streets. |
| enforce | Increase police force in areas where crimes seem to be committed the most. |

| enforce | Increase Policing and make sure criminals are punished and not just released right away |
|---|---|
| reform | It needs to look at the social and economic issues that are spurring the crime rise and address those. |
| enforce | The city needs to devote more resources to the police. |
| enforce | Invest in more security devices such as cameras and mobile recording towers. |
| enforce | Increase police presence |
| enforce | more police |
| enforce | Make a curfew for residents. |
| reform | Yes, Addison needs to invest in its people. The root of most crime is lack of means to buy necessary items. Invest in social programs to make life easier on the residents so they don't resort to criminal activity. |
| both | There should be an oversight committee to evaluate increasing the size of the police force, also hold a town hall to educate residents on how to eliminate their vulnerability to crime.  Education seminars for educating youth and giving them chances to improve their lives rather than relying on crime should be implemented. |
| enforce | Addison needs stricter law enforcement and perhaps a neighborhood patrol program. The community needs to be engaged in making it a safer place as well. |
| reform | Investigate what is causing the crimes, the kind of crimes being committed, and provide services to mitigate that. Most problems can be solved by education, compassion, and de-escalation. |
| reform | create more community programs to support youth, young adults, and vulnerable members of their community.  improve education, welfare programs |
| reform | In order to reduce crime, Addison needs to help ex-offenders find secure living-wage employment. |

| | |
|---|---|
| reform | Better funding for programs to help poor people could help reduce crime in the city. |
| reform | Addison needs to invest in more public services that can reduce crime, such as mental health services, food assistance services, housing, etc. |
| reform | Figure out the root cause of the crime. If it is rising poverty and inequality, Addison needs to invest more in the community. If it is community members committing the crime, Addison needs to focus on a restorative justice approach so that those members can actually be reintegrated into society. |
| enforce | More Security and strictly punishing those who are doing crimes, more surveillances |
| reform | Figure out who is commiting the crimes and find solutions to prevent these people from doing so. |
| reform | Addison needs to join any communities that discourages crime and advertise to the city community about reducing crime and participate in any volunteering activities |
| enforce | They should have a larger police presence.  They should have concerned neighborhoods establish neighborhood watch patrols.  Perhaps a security guard in smaller strip malls.  Tougher jail sentences or fines for illegal activity. |
| enforce | There needs to be more cops |
| enforce | Addison needs to expand its' police force. |
| enforce | Increase law enforcement presence and community outreach. |
| enforce | More protection and police. |
| reform | Increase spending on education |

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| reform | More after school programs for teens |
| reform | Better schools and education |
| neither | nwighborhood patrols |
| reform | UBI and rent control |
| enforce | Higher police patrol and enforce stricter punishments for crimes. |
| reform | The town needs to find ways to discourage anti-social behavior, and fund initiatives that would decrease poverty in the town. I would suggest funding after school programs for at risk youth, and strengthening the school system. The rule of law through the police force should also be communicated well to the residents. |
| both | Maybe to help the crime rate in Addison there needs to be more patrolling by officers and there should be educational crime prevention and recreational programs for the youth of this city. By focusing on the youth of the city in a positive way perhaps crime can be prevented in a way. Maybe a type of neighborhood watch program might encourage the citizens of this city too. |
| reform | Probably address other problems in the city, like finding people work, providing mental health care, things like that that are known to increase crime when neglected |
| both | Focusing on criminal justice, social programs, and strengthening relationships |
| enforce | Sounds like organized crime or gangs have taken over the city. The police departments and DEA should be given more funding to fight back on crime. |
| both | There needs to be more police presence in problematic neighborhoods to deter crime. Youth programs are needed to help educate young people, stimulate their minds, encourage new hobbies and interests, and to discourage unlawful activities during free time. |

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| reform | I think that they need to look into the cause of the crime and figure out what they can do about that. Also important to consider what the type of crime is - whether it is serious or smaller petty crimes. Is it because prices have increased and there is more theft? Or is it because people are unhappy? Or is there a serial killer? I think it's important to see where that is concentrated and what the types of policing are in the areas, what the income difference is. etc. |

8.2 Pilot study: Findings

8.3 Replication study: Materials

Virus, long vignette:

*Crime is a virus infecting on the city of Addison. The crime rate in the once peaceful city has steadily increased over the past three years. In fact, these days it seems that crime is plaguing every neighborhood. In 2004, 46,177 crimes were reported compared to more than 55,000 reported in 2007. The rise in violent crime is particularly alarming. In 2004, there were 330 murders in the city, in 2007, there were over 500.*

Virus, short vignette:

*Crime is a virus infecting on the city of Addison. The crime rate has steadily increased over the past three years. In fact, these days it seems that crime is plaguing every neighborhood. The rise in violent crime is particularly alarming.*

Beast, long vignette:

*Crime is a wild beast preying on the city of Addison. The crime rate in the once peaceful city has steadily increased over the past three years. In fact, these days it seems that crime is lurking in every neighborhood. In 2004, 46,177 crimes were reported compared to more than 55,000 reported in 2007. The rise in violent crime is particularly alarming. In 2004, there were 330 murders in the city, in 2007, there were over 500.*

Beast, short vignette:

*Crime is a wild beast preying on the city of Addison. The crime rate has steadily increased over the last three years. In fact, these days it seems that crime is lurking in every neighborhood. The rise in violent crime is particularly alarming.*

## 8.4 Replication study: Categorizing of responses

| category | response |
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| reform | I think that they need to look into the cause of the crime and figure out what they can do about that. Also important to consider what the type of crime is - whether it is serious or smaller petty crimes. Is it because prices have increased and there is more theft? Or is it because people are unhappy? Or is there a serial killer? I think it's important to see where that is concentrated and what the types of policing are in the areas, what the income difference is. etc. |
| both | Educate it's citizens, also apply strict penalties for crimes committed. |
| both | To bring down the crime rate in Addison, the city needs to take some steps. Here are a few suggestions:<br><br>Put more police officers on the streets: This will help keep people safe and make it harder for criminals to act.<br><br>Get people involved: Working with the community to solve crimes in their own neighborhoods can be really helpful.<br><br>Tackle the root problems: Addressing issues like poverty, unemployment, and a lack of education can reduce the reasons why people turn to crime.<br><br>Use technology: Installing security cameras and using data to predict and stop crime can help the police do their jobs better.<br><br>Partner with groups that help people: Working with organizations that provide help for mental health, drug problems, and homelessness can address some of the underlying factors that lead to crime.<br><br>Make sure repeat offenders face serious consequences: This will discourage people from breaking the law and serve as a warning to others. |
| reform | They need to establish more community involvement, address the crimes and provide resources to the community. |

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| both | Addison should expand their police department in two ways. 1) They should increase the number of officers they employ. In order to ensure they have quality candidates, they should thoroughly vet each candidate and compensate them according with a higher standard of applicant. 2) Addison should have their police have community relationship outreach events, where the community and police get together to talk about these issues. This will increase the mutual trust and not make people feel as though they are being put into a militarized area. |
| reform | Addison needs to look into why there was as increase in crime rate, so they can figure out how to properly deal with it. |
| enforce | More police |
| enforce | Add cameras, add more nightlights to darker areas and allies, have patrol and undercover patrol out at night, raise the penalty for murder |
| reform | evaluate the original causes of crime and seek to provide support services to prevent those root causes |
| reform | I would first address poverty -- does everyone have adequate housing, employment, food, and healthcare? Then I would address if there is a drug endemic and address it as a public health crisis. |
| enforce | Hire more police and invest in home safety measures |
| enforce | In order to reduce crime in Addison, more police should be hired and start patrolling neighborhoods proactively, a curfew should be put in place, and there should be a crimestopper tip line set up for citizens to report crimes and get rewarded for it. |
| reform | Better gun laws. And better training for the cops. Maybe some community programs to help with things that might lead to crime |
| reform | An important first step is for Addison to analyze the trends of crime and make the public know about them, then take steps to address them specifically. |
| reform | Address the cause of the rise in crime. Has there been an increase in poverty or a rise in drug addiction? Do children and young adults need healthy activities to keep them out of trouble? The first step in solving the increase in crime is to find out what is driving it? |
| enforce | Have some stricter laws regulating crime / Have a police force more capable to tackle this issue. |

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| enforce | get more police |
| reform | Addison needs to put preventative measures in place, starting at a young age because young adolescents are very impressionable during developmental stages. |
| enforce | Increase police and enforce stricter penalties for crimes |
| reform | Increase jobs |
| neither | reduce the cops |
| reform | prevent infection |
| enforce | Sentence crminals |
| neither | aaaaa d |
| enforce | This is a complicated question because it doesn't address what crimes are being committed. Is there an increased drug problem? Is the gang situation increasing? It's easy to say that an increased police presence would be helpful -- and it would -- but it's a bandage to the overall problem. |
| reform | Addison must focus on eliminating the material conditions that lead to crime. Focusing on poverty elimination through education, jobs guarantees, wage increases, community outreach projects, and guaranteed housing will eliminate the prevalence of most crimes. Providing free mental health care will help reduce crime even further. Focusing criminal justice on restorative and rehabilitative justice rather than retributive justice will all but entirely eliminate crime. |
| enforce | I'm sure adequate jail or prison time, appropriate bail bonds or no bail bonds would possibly prevent more serious crimes from happening. I think the way the city looks and whether or not it's taken care of has a good contribution to crime rates. |
| enforce | Addison needs to crack down on criminals and patrol the streets more often to look for suspicious behavior |

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| reform | Addison needs more social workers, mental health facilities, and resources to help the community |
| enforce | Addison needs to put cameras up to deter and catch criminals |
| enforce | Stiffer penalties for crimes. Faster court systems so a crook canâ€™t stay on the street for years while dragging out a jury trial. More cops but they would need body cams to make sure they are acting like a good cop should. |
| both | Well, without knowing anything else, I'd say they need to get to the root of the problem. Drugs? Understaffed police force? Do they need better education? It's hard to say what they need to do without knowing anything else. One thing I won't do is just blindly hand the police more money... |
| reform | Addison needs to offer a gun buyback program, encourage neighborhood watch programs, hold frequent town halls to hear about concerns directly from constituents, and empower their police force with deescalation training. |
| reform | Address problems that drive crime like homelessness, addiction, and unemployment. |
| reform | Analyze the data from the crimes, determine triggers and address them. |
| enforce | Enforce the law and allow the police to be better funded. |
| both | think through the policing approach, alongside create foundation programs of social and economic developmental work to assist the peoples most likely to commit crime to offer alternatives |
| reform | Increase wages and monitor what their people are watching on social media, and what they are listening to in their music, this is the problem to my opinion to a lot of why the violent crime is rising |
| both | Addison needs to address the community. Add police and detectives to the police force. They should be from the community and knowledgeable of the situation and the reason for the rise in crime. |
| reform | Addison can reduce crime by maintaining existing and adding new social welfare programs such as free or reduced childcare, increasing social safety nets, increasing funding spent on food stamps, WIC, etc. |

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| both | Addison needs to increase police foot patrols around the city to deter opportunistic crime. They additionally need to provide resources for the less fortunate so that they do not have to turn towards crime to make ends meet. |
| reform | Look into what crimes are happening and check on the welfare of the people of Addison. Is quality of living going down? What are the motives for the crimes taking place? |
| reform | I think start with the areas of poverty. Help bring those areas up, anyone struggling to make ends meet and the homeless, would give people a new sense of hope. |
| reform | Be more aware |
| reform | Find the root cause of crimes. Incentivize crime reducing actions, etc |
| both | Addison needs to invest in more policing while also making sure there are plenty of mental health facilities available for its residents who might be struggling with feeling violent. |
| both | I feel that the city of Addison could take several routes. Most of the time, high-crime areas also have problems with substance abuse and mental health disorders. Providing resources for those experiencing substance abuse and mental health disorders would probably help in the long run. They could also increase patrol in high-crime areas. There could also be stricter weapons laws put in place, since most crimes are violent. |
| reform | Try to figure out the cause of the crime and work on that problem. For example, if unemployment has increased, try to create more jobs. |
| reform | I think Addison needs to invest more in community activities and make sure that everyone has the opportunity to grow and learn in the community. |
| reform | If Crime is a virus, then the citizens of Addison should isolate until the virus either dies out, there is a safe treatment for it and its symptoms, or there is preventative measure that can be taken against this virus (vaccines and/or medicine) |
| reform | Addison needs officers who work with the people, and a culture to sustain the familial atmosphere |
| reform | Better education, better gun control, neighborhood watch groups. If I really knew I would win the Nobel Prize. |

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| both | Have more outreach and community programs and increase police and residents interaction and communication |
| both | To reduce crime in Addison, the police force should be increased. Police should get more training and better safety equipment. Programs to involve youth and community need to started and funded. Schools should raise awareness in children. |
| reform | Provide more job opportunities and community outreach programs for residents. Provide more mental health resources to residents. |
| enforce | Start a crime stoppers |
| enforce | Hire more police officers. |
| reform | It needs to address the root causes, usually low employment, homelessness, drug abuse. |
| neither | Honestly, I have no clue. I don't understand the causes of crime. I don't know the specific socioeconomic situation of Addison. Without more detail on the nature of the problem, I can't provide and opinion that actually means anything. |
| neither | The first thing you need to do is figure out whether or not there is a problem with crime in the city. Your description seems to have been written by a hysterical child. |
| reform | Initiate public assistance and community events. |
| reform | Get to the root cause of the crime rate and solve it by addressing the cause. |
| both | Community outreach and tougher violent crime penalties |
| both | Increase funding and availability of both social programs and police patrols |
| enforce | Arm the citizens, who are legally of sound mind and are legally in the area in order that they can protect themselves until police arrive |
| enforce | Increase police force |

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| reform | create public welfare programs that help disadvantaged communities. |
| enforce | Have a more enforceable police presence that sends the message that crime will not be tolerated and those who commit crimes will pay the consequences. |
| both | Increase police presence and invest in the community |
| reform | Investigate the economic hardships that citizens of Addison may be experiencing. |
| enforce | increase police hirings, decrease gun ownership hurdles. |
| enforce | increase the amount of police on the streets |
| reform | See if there are ways to better support the disadvantaged or mentally ill |
| reform | First off, try to understand WHY the crime rate has risen so sharply in the past three years. If you are able to identify at least one proximal cause you have a chance of defeating the problem. This can be hard to do, but it is important to mitigating the problem over the long term. Because of the work involved in doing this is extensive, most communities simply add more police and jails. Quite easily, the common universal answer is lack of education and opportunity for folks who are disadvantaged in one way or another. Early education is key. Community education outside of school is also important. Another strong origin is the lack of a stable home and family where peaceful values are instilled. However, the cause of unstable homes is rather complex, typically involving lack of boundaries when it comes to setting a good example for young ones. |
| enforce | add more law enforcement |
| reform | It needs to address the problem of why people are committing crimes. They should offer programs that would encourage people to do constructive activities and not commit crimes.Added police officers would also help. Social workers also need to be available to help those in need. |
| reform | Increase minimum wage. |

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| reform | Address the underlying issues causing people to turn to crime. |
| reform | figure out the root issue - are the crimes surrounding food insecurity? housing insecurity? organized violence in the area? high unemployment rates? |
| neither | It is impossible to create a solution to this problem without fully understanding the statistics about the city of Addision and what the current policies are in existence. Not to mention, these are very old statistics at this point. One may be solving for a problem that no longer exists or has already been mitigated. |
| enforce | Increase police patrol |
| both | I am honestly not sure because I do not know what the city is like or what is going on. Maybe they need more policing or laws, maybe they need more social services, etc. |
| reform | Addison needs to identify the root cause of their crime before they can address it. Is it teenagers who have nothing to do? They could impliment after school programs or invest in a park for them to hang out at. Have people been losing their jobs and need to resort to crime to survive They could set up public assistance programs to help with necessities and have days at the library where they help people write resumes. Only by identifying the cause of the crimes can they hope to reduce them. |
| enforce | Increase their budget for the police force significantly. |
| enforce | Add more law enforcement and enforce the law with harsher punishment |
| enforce | In order to reduce crime, Addison needs to catch the criminals |
| enforce | Addison needs to make its police department more involved (community policing) |
| neither | I have no idea because you didn't provide enough info, what type of crime is it? I could say something like "Ban guns" but that would be useless if 90% of the crimes are car hit and runs or something. |
| enforce | To reduce crime, Addison needs make sure neighborhoods are under crime watch, and that more cameras are in stores and public places to prevent theft. |

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| reform | Raise the level of awareness and education while helping implement a family structure with a good father figure who bases his beliefs on traditional values. |
| enforce | Addison needs to crackdown on criminals by seeking them out and serving severe sentences for crime. It needs to let criminals know that they will not get away with crime and they will pay a heavy price once they are found. |
| reform | Determine the cause of the increase in crime. |
| reform | Solve whatever economic crisis is happening in the city. |
| enforce | put out more surveillance and police presence |
| enforce | Increase security and police |
| enforce | Spend more on policing |
| reform | Addison should seek to understand the cause of what's causing the increase in crime rate and address the underlying cause. For example, if there is an increase in poverty, unemployment, homelessness, etc. Addison should focus on strengthening its social safety net to better support its citizens. |
| enforce | Increase public cameras and increase a well vetted and trained police force. |
| enforce | Addison needs to put more police patrols around the city to surveillance the city. |
| enforce | Hire more police officers. |
| reform | Finding the reason for violence, and stoping that source. |
| reform | Look to the root cause of it. |
| enforce | Increased police presence & teach public safety |

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| both | Addison needs more police officers to help combat the training. The city also needs comprehensive community-wide meetings to discuss the issue. |
| reform | Have more good paying jobs so people work more and dont turn to crime along with making better schools to help build job skills |
| enforce | They need to offer better pay and training to police officers and expand their police force. |
| reform | Addison should figure out the core reason that is causing crime. Whether it is due to poverty, drugs, low income, etc, finding the root of the problem is the way to solve the increase in crime. |
| both | Increase police presence. Develop more social outreach programs. |
| neither | Figure out what crime is the highest |
| reform | Find ways to lower the poverty rate and get more individual ownership in the community. |
| reform | Addison needs to start thinking of ways to reduce crime immediately as it is clear by there being an increase every year for the past three years that the crime is only increasing rather than staying the same or beginning to naturally decrease. Addison needs to create programs to help bring awareness to what is going on and, hopefully, scare some of the wrongdoers off as they feel that more eyes are open to them. |
| reform | gun control and stopping people from attaining deadly weapons would help to stop murders and violent crime in particular |
| both | put more police in the bad neighborhoods and put more money into the low income areas and education across the city |
| enforce | I think that in order for Addison to reduce crime they need to have more police officers available to patrol the area. They also need to give harsher punishments to those criminals that are committed the crimes to try and hopefully discourage them from future negative activists. |
| enforce | They need to put perpetrators in jail and KEEP them there. |
| reform | More police presence and gun control; having programs to educate people and keep them out of crimes |

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| reform | First the City Leaders need to analyze the reasons crime has increased, is it economic, social or could there be a new criminal element that has moved into the city? The root cause needs to be addressed in order to stop the worsening of the situation. Next the law enforcement officials need to police and prosecute the criminals at an increasing rate. Lastly community outreach programs need to be executed so that Citizens are made aware of ways to protect themselves and their property better, so they can be part of the solution rather than victims. |
| enforce | Increase police presense in the city. |
| both | They need to institute better police initiatives and also after school and local programs to help curtail these criminal activities especially in youth. |
| reform | I would allocate more resources towards the justice system and education for law enforcement on best practices. I would do more community outreach asking neighborhoods to take more accountability for the rise in crime. Lastly, I would do more research on what legislative policies could be implemented. |
| reform | He needs to increase job availability and money available for people. Violent crime is because of lack of social structures and thief is because of poverty and social inequality. |
| enforce | Arm the innocents and teach them self defense and prevention techniques. |
| reform | Addison needs to provide resources to its residents that will deter them from going down the path of crime to fulfill their needs. |
| reform | Figure out what is making citizens so desperate that they feel they need to commit these crimes. Perhaps provide more resources. |
| neither | Based on the increase over the 3 year period Addison should try to reduce its crime |
| reform | Rehabilitation Centers, Police Reform, and Tighter Gun Laws |
| enforce | Oh man I have no idea. I think that our police officers need to go through more training, like how in other European countries they need to have a specific degree in order to become a police officer. |

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| reform | They need to get to the root cause of why so much crime is going on in that city. I feel like they are not doing enough to stop crime but enabling it, so more crime can happened. |
| neither | I think it should prioritize reducing crime |
| enforce | Punish more criminals more severely |
| reform | I think Addison needs to figure out what has happened that encouraged the rise in crime rate and come up with a better system that does not encourage people to resort to violent crime. |
| enforce | More police in the crime areas. harsher punishment for the criminals. |
| enforce | Provide security to ensure that crime is reduced. |
| enforce | Addison needs to hire more police to patrol the streets and answer calls, especially at night. If criminals know that there are police near by and they will be caught, they will be less likely to commit a crime. |
| both | More police pertection and community programs |
| enforce | Addison needs to hire more law enforcement, create community watch programs and promote more severe punishment for offenders. |
| both | Addison needs to take a look at their policies surrounding crime as well as the socio-economic status of the population of the city. If socio-economic status is low, Addison should provide more services to the members of the city who are struggling with their daily lives. |
| enforce | Addison needs to hire more police officers to do more arrest and patrols of the streets. |
| enforce | I think they need to be stricter in regards to those committing the crimes. |
| neither | I would need more information to answer this. What kind of crimes are taking place? Where are they taking place? |

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| neither | I don't have an answer to that. |
| neither | I think that Addison needs to take measures to reduce crime. It's showing that there has been an increase in the number of crimes over the past 3 years, and more specifically, violent crime. |
| enforce | Those committing the crime should be arrested, tried and put in prison if found guilty. |
| enforce | Needs to punish the criminals more and not let them off at all. |
| both | More police on the streets, improvements to it's outdoor lighting, and better social services since much of the crime occurs in low income areas. |
| both | Significantly increase citizen involvement in crime reduction strategies, and explore root causes of the crime to target solutions. |
| enforce | They need to be more strict on crime and punish criminals. |
| reform | Find the route of the problem and involve the community |
| enforce | Add more police patrols |
| enforce | Hire better trained police officers who crack down on these offenders and give harsher sentences. |
| both | In the short term, increase police presence. Long-term, work to alleviate poverty and improve social safety nets. |
| enforce | Hire more police. Go after drug cartels and illegals. |
| enforce | There's no simple solution but an increase in the population of the police force couldn't hurt. |
| enforce | Addison needs to understand where the crime is centralized, what locations, areas. What times of day. Why is crime centered in these areas? Then step up patrols and have officers check on people in that area. Be a friendly face in the neighborhood, let people know that they will be secure. |

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| reform | I think that an investment in education, universal basic income, and Jobs programs would be helpful. |
| enforce | Addison needs to increase its police force so they can patrol the city streets more frequently as a deterrent to crime. |
| enforce | Addison needs to have better law enforcement to reduce crime. |
| both | The rise in violent crime needs to be combated in two directions. First off, the city needs to increase police presence and patrol. Their involvement will start off by making people feel safer. Secondly, an analysis needs to be done to determine who and/or what is causing the increase in crime. The question we are trying to answer is to determine if crime is coming from outside of Addison inwards, or if Addison itself is losing jobs and businesses, and need policies to help give more opportunities to the citizens of the city. In additional to the two, policies need to be looked at to determine if the laws are enough of a deterrent for violent crimes. If people committing crimes aren't being sufficiently punished, then the policies also need to be revisited. |
| enforce | Get the police presence out there! |
| neither | With no information about what kinds of violent crime are being committed, I would say the city of Addison needs to track more specific aspects of the crimes, victims, and perpetrators. |
| enforce | Increase police force |
| enforce | Need to establish a violent crime task force. Need a higher clearance rate for these type of crimes. |
| enforce | They need to put more police officers in the street to prevent crime |
| reform | Raise in the minimum wage to a livable income. Stop using all the tax dollars to keep the rich areas clean cut while not even cleaning the poor areas. Create a gun registry and enforce background checks. Expand healthcare and food access. |
| enforce | Bring more police into stop crime |

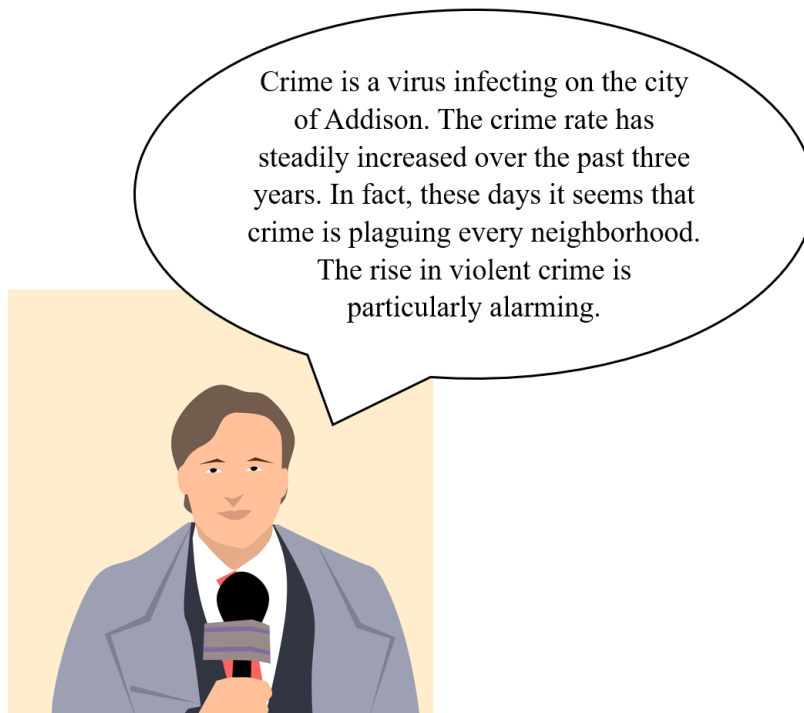| | |
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| enforce | Hire more police, and make them do more patrols in the areas that the crime is high in. When you catch these criminals strengthen the sentence so people will know, this will not be tolerated anymore. |
| reform | I think Addison needs to work on their prison system. Give inmates a chance to rejuvanate themselves through various programs. I think the actual infrastructure of the city could help too - the neighborhoods that are especially bad could use programs as well and developments. |
| enforce | Arm every single, adult, citizen with a firearm of their choice. When criminals fear their victims more than the legal system for their actions, crime will be reduced dramatically. |
| both | Invest in local policing and also give jobs to each neighborhood. |
| reform | The first thing that should be done is to find out why crimes are happening. What is causing people to commit crimes more often? The answers to those questions could be very instrumental in fixing the problem at its root. |
| enforce | They need to hire more police officers and install cameras on the streets to help reduce the crime rate. |
| enforce | Ship the criminals to a third world country |
| both | Addison needs to add police monitoring and visibility, and also identify underlying drivers of crime (housing instability, joblessness, lack of mental health care) and support addressing those as well. |
| enforce | They need to increase police monitoring within the area. |
| enforce | They need to have more police out doing their jobs properly and train them to help the community more. |
| enforce | Make punishment more serious so they don't want to commit the crimes |
| enforce | Increase the penalties for crime and increase the amount of law enforcement patrolling the streets. |
| reform | First they need to figure out what is causing the increase. |

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| both | It needs to focus on the areas where the crime is happening the most and police those areas more. In addition, find out why the problem is increasing and promote ways to help those vulnerable to becoming criminals to avoid this path. |
| enforce | Hire police and private security. In the community, there needs to be a crackdown on renters, with any late payers/nonpayers and other problem tenants evicted. A homeowner's association should be formed, and those who do not follow regulations should be forced to leave. It is only by getting the people to act civilized that one can clean up a crime ridden town, and by getting rid of those who refuse to be civilized. |
| enforce | Have more community policing, where police patrol on foot or on bicycles in the neighborhoods with the highest crime rates. Also, need to make sure that those convicted of major crimes serve their sentences. |
| enforce | Hire more police. Arrest more people. Make bail much higher. |
| enforce | i believe what addison needs to do in order to reduce crime is have more patrolling officers to keep the city protected at all times of the day. |
| reform | Addison needs to fund social services in order to reduce poverty and provide access to mental healthcare. |
| enforce | Enforce strict regulations |
| enforce | They need a stronger police force and heavy punishment for law breakers. The sheriff ought to deputize the citizens and issue more pistol permits for self defense. Citizens could also form neighborhood watch programs. |
| enforce | Public relations campaign addressing the situation. More police and tougher sentences from the justice system. |
| enforce | Have a greater police force that is more active all the time so that they are able to stop crime before it happens. |
| reform | From the write up Addison was once peaceful<br>Over the past 3 years, crime has been plaguing every neighborhood<br>Firstly, they need to identify the root cause of the crime over the past three years.<br>What actually changed?<br>Most time unemployment is the root cause.<br>When people are idle, the tend to have room for negativity. |

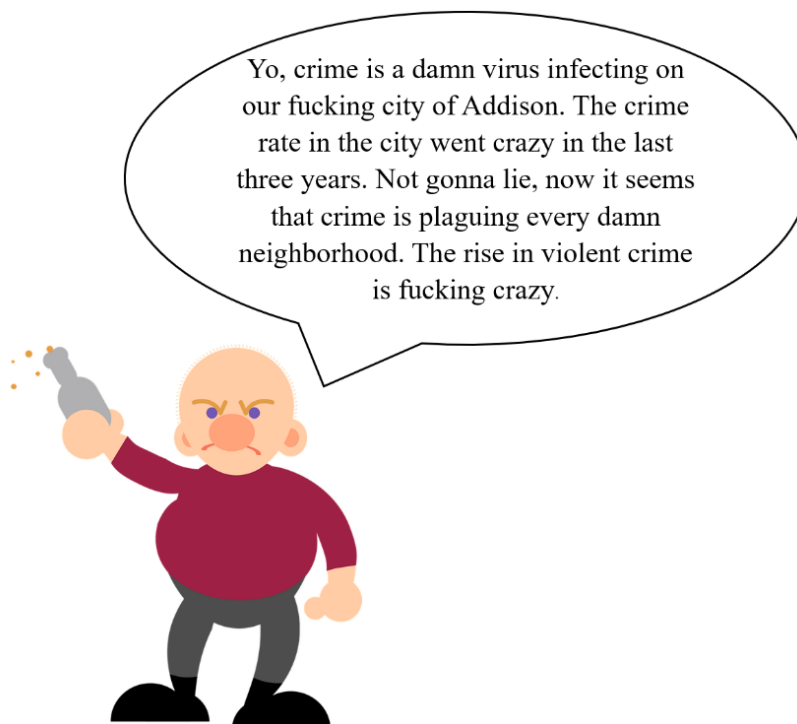| | |
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| | First, identify the problem before applying means to reduce the crime. |
| reform | It needs a better healthcare system. |
| reform | Addison can find ways to protest with others or try to talk to local political leaders. |
| reform | Address the psychology of the citizens before they become adults. If children learn the importance of morals from stable home, friends and mentors, crime numbers over time should improve. |
| enforce | Realistically, a break down of blocks or wards would need to be done. From there the city would be able to see what the demographics of an area would be. Comparing those results with the suspects and arrested perpetrators would glean an essence of what parts of the city need more police activity (regardless of race of criminals), more neighborhood watch groups, and more security systems installed. City cameras (CCTV) and citizen's home/business owned cameras. |
| enforce | Hire more police. Enforce the law. |
| enforce | They need to make the punishment more severe so people wouldn't want to commit a crime. |
| both | Addison need to find out what is driving the crime and try to establish programs that will get the root cause, be it better employment opportunities or increased treatment for substance use disorders.  In the short term, perhaps increase neighborhood watch groups and increase police patrolling. |
| reform | give everyone so much money a month |
| enforce | Addison needs to enforce stricter laws and hire more police to patrol the city. |
| enforce | More police presence, more city safety measures, (more street lighting, emergency buttons, etc.) |

| | |
|---|---|
| enforce | To start with, Addison needs to unleash the police. Arrests need to be made, and active police presence on the streets needs to be shown. The courts need to punish criminals as well, treating repeat offenders with particular harshness. |

8.5 Follow-up study: Materials

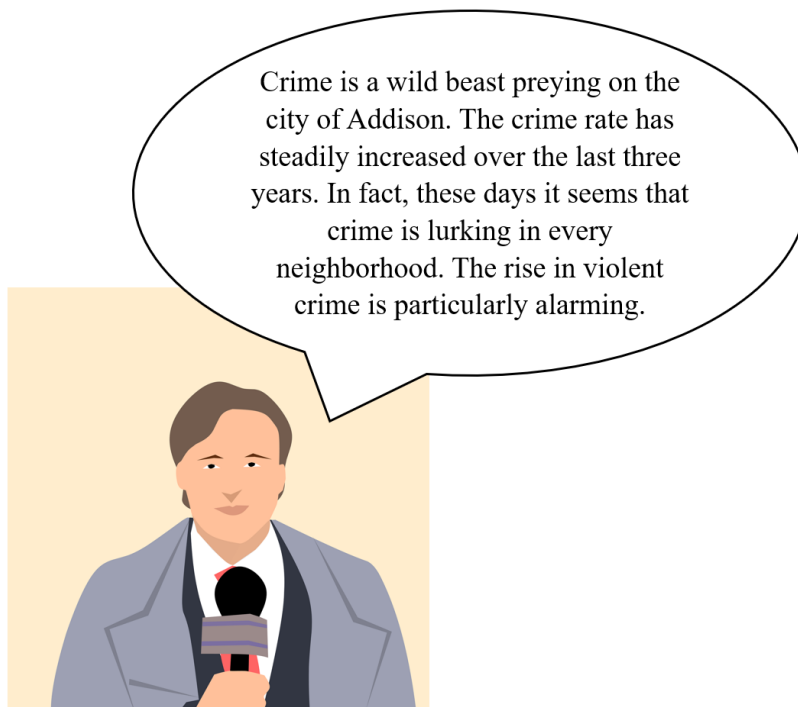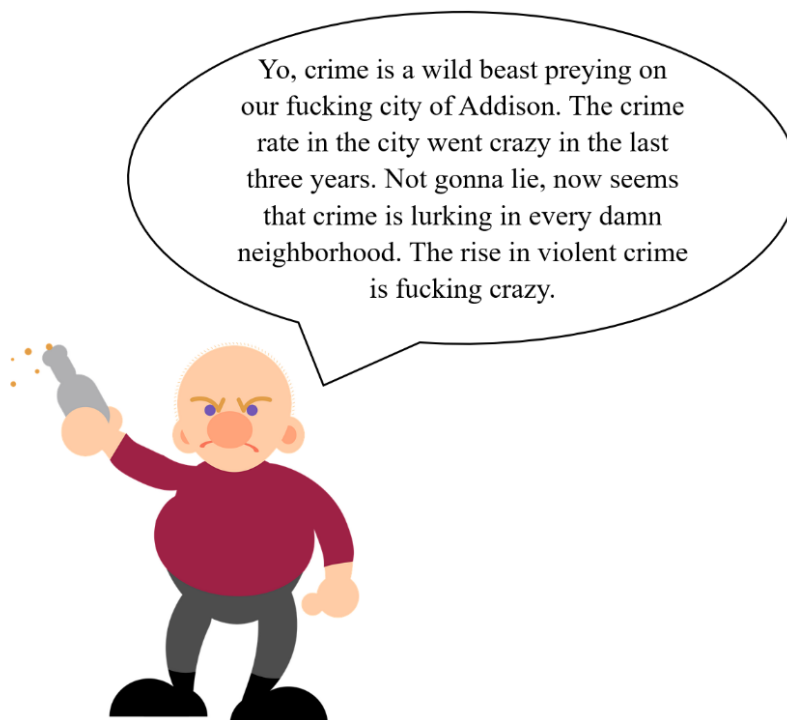Virus, reliable speaker:



> Crime is a virus infecting on the city of Addison. The crime rate has steadily increased over the past three years. In fact, these days it seems that crime is plaguing every neighborhood. The rise in violent crime is particularly alarming.

Virus, unreliable speaker:



> Yo, crime is a damn virus infecting on our fucking city of Addison. The crime rate in the city went crazy in the last three years. Not gonna lie, now it seems that crime is plaguing every damn neighborhood. The rise in violent crime is fucking crazy.

Beast, reliable speaker:



Beast, unreliable speaker:

Declaration of Authorship

I hereby confirm that this paper and the work presented in it is entirely my own. Where I have consulted the work of others this is always clearly stated. All statements taken literally from other writings or referred to by analogy are marked and the source is always given. This paper has not yet been submitted to another examination office, either in the same or similar form.

Tübingen, March 31st, 2023

*Miriam Schiele*

Miriam Schiele