



DEPARTMENT OF  
APPLIED IT

# THE ANGRY DECISION MAKER

- Does anger elicited by video clips influence judgments?

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# Abstract

In the last 20 years, the research interest on emotions' impact on judgments and reasoning has grown intensely (Lerner et. al, 2015). In particular, The Cognitive Appraisal Tendency Framework, Feelings as Information Theory, and The Carry-Over Effect suggest that we are distinctly impacted by our emotions in our daily judgments and decision-making processes, but we are unconscious of these impacts. This study was conducted to investigate how eliciting anger through video clips might influence risk and aggression judgments. We hypothesized that individuals in an angry emotional state will be more likely to engage in risky and aggressive behavior than individuals in a neutral emotional state. Our results suggest no significant effect between the anger emotional state and neutral emotional state. Further research is needed to understand if and if so under what circumstances anger and other discrete emotions are influencing our judgments.

Keywords:

**Emotion eliciting, anger, judgment, risk, aggression.**

# DEN ARGA BESLUTSFATTAREN

- Påverkar ilska framkallad av videoklipp våra bedömningar?

## Sammanfattning

De senaste tjugo åren har forskningsintresset för emotioners påverkan vid beslutsfattande ökat drastiskt (Lerner et. al, 2015). I linje med detta förklarar The Cognitive Appraisal Tendency Framework, Feelings as Information Theory och The Carry-Over Effect hur vi omedvetet blir influerade av våra emotioner i våra dagliga bedömningar och beslutsfattandeprocesser. Därav genomförde vi ett experiment för att undersöka om ilska framkallad av videoklipp påverkar bedömningar kring risk och aggressivitet. Vår hypotes var att personer i argt emotionellt tillstånd kommer att göra mer riskfyllda och aggressiva bedömningar än de i neutralt tillstånd. Resultatet uppvisade ingen signifikant effekt mellan den arga betingelsen och den neutrala betingelsen. Vidare krävs fler studier för att nå en djupare förståelse om och isåfall under vilka omständigheter ilska och andra emotioner påverkar våra bedömningar och beslutsfattande.

Nyckelord:

**Framkallade emotioner, ilska, bedömningar, risk, aggressivitet.**

# Foreword

Both authors contributed equally to all parts of this study.

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# 1 Introduction

The dominating views in the western school of thought have long considered rationality and logic as the essential parts of reasoning and decision making, whereas emotions have been valued as a less important player in these processes (Lerner et. al, 2015). This has not been left uncontested though. Influential thinkers such as David Hume argued, already in the 1700s, that “Reason is, and ought only to be, the slave of the passions, and can never pretend to any other office than to serve and obey them.” (1978 [1738], p. 415, Hume). Along with him, the neuroscientist Damasio meant that emotions are a postulate to enable decision-making (Damasio, 1994). His patient Elliot with damages to his orbitofrontal cortex, a region important to process and express emotions, lost his ability to experience emotions. This resulted in him losing the proficiency of guiding himself in making any judgments at all (Bechara et. al, 2000).

Johnson and Tversky also found emotional biases when participants made judgments of likelihood, revealing that the answers did correspond to the participants’ current mood. This phenomenon has become known as The Mood Congruent Effect (Johnson & Tversky, 1983). Other theories such as The Feelings as Information Theory (Schwartz et. al, 2012) and The Carry-Over Effect suggests similar effects of how emotions distinctly impact reasoning (Loewenstein & Lerner 2003), and more recently The Cognitive Appraisal Tendency Framework has shown how our individual emotional experiences shape how we perceive and judge events differently (Stellar et. al, 2018). All these perspectives are taken, along with others, have demonstrated what important role emotions play in judgments and decision making. Emotions are influencing us on many levels such as how we process, learn and remember information (Petty & Cacioppo, 1986, Stellar et. al, 2018).

Of all universal emotions, anger is one of the easiest to detect, something that has been explained by The Anger Superiority Effect (Pinkham et. al, 2010). This effect concerns the human sensitivity to detect angry faces in a crowd faster than other emotional expressions (Lerner et. al, 2006). As a result of these findings, anger seemed to be an interesting emotion to examine in this paper.

In decision-making literature, judgments and decision-making are often used as synonyms. For this paper, we intended to put a distinction between the two, since we did focus on judgments. We were interested in the participants' self-assessment of the likelihood to engage

in risky and aggressive behavior rather than the execution of the behavior. Sambardo and colleagues expressed this difference as “While judgment only requires evaluation, decision making also requires action. “(p.3, Sambardo, 2020). Taken all together judgments can be labeled as an essential part of but not the whole process of decision making. More criteria could be found to deeper examine the difference. But phrasing the definition of the difference between judgments and decision making is an elusive task to master and goes beyond the scope of this paper.

In the field of judgments, risk estimations have been a widely studied subject of interest (Johnson & Tversky, 1983, Lerner & Keltner, 2000). This made it an interesting judgment category together with aggression estimations that are fruitful related to how anger is manifested. We hypothesized that individuals in an angry emotional state will be more likely to engage in risky and aggressive behavior than individuals in a neutral emotional state.

Even though the interaction between emotions and cognition is a big field of research, only a few studies have investigated how specific emotions influence judgments about risk and aggression (Lerner & Keltner, 2000). The combination of studying how anger might affect the judgment of risk and aggressive behavior by inducing anger through video clips is rather unexplored. Therefore, we developed an online method to study the effect of emotions on human judgment through emotion elicitation. This was possible due to previous emotion research. The design setup in our study consisted of a mixture of neutral film video clips, an angry video clip, and a mixed judgment questionnaire about risk domains and aggression aversion. We hope that our method design setup can contribute to the research field. Further research can reveal more about how and if different discrete emotions influence judgment.

## 2 Theory

### 2.1 Important theories.

Earlier emotion research has found that emotions have a possible incidental effect on unrelated judgments, choices, and decisions in other areas of life (Lerner et. al, 1998; Han et al., 2007, Lerner & Keltner, 2000; Lerner & Tiedens 2006; Loewenstein & Lerner 2003; Pham 2007 & Vohs et al. 2007). An incidental effect can be operationalized as a temporarily unintentional influence caused by an emotion. This is also known as The Carry-Over Effect (Loewenstein & Lerner 2003). These sources behind The Carry-Over Effect can be stimulus such as rainy weather, watching a film, or having a hectic deadline that influences unrelated judgments (Lerner & Keltner, 2000; Bodenhausen, 1993; Clore et al., 1994; Forgas, 1995; Forgas & Bower, 1988; Schwarz, 1990; Schwarz & Clore, 1996). Another way that current emotions can influence judgments is by changing your perception of predicted utility for possible outcomes, based on the logic of the present emotion (Loewenstein et al. 2003).

The central idea of The Cognitive Appraisal Tendency Framework, shortened as CATF, is that our perception is subjective, meaning that subjective emotions experienced in a certain situation will impact how you evaluate this situation, uniquely from other experiences (Stellar et. al, 2018, Lerner & Keltner, 2000). This is a cognitive process that creates personal appraisals and judgments that we reuse later in similar situations (ibid.).

These awakened emotions have been shown to have a delay and can without our awareness influence unrelated judgments and behavior (Lerner & Keltner, 2001). An evoked emotion can stay between 1-10 minutes before it fades (Coan & Allen, 2007, Gneezy & Imas, 2014). According to CATF, these triggered emotions provide coordination of causal attributions, enabling us to pinpoint opportunities and problems fast (Frijda 1988). It also includes a motivational function (ibid.). This activates predictions from earlier experienced appraisals from similar situations to guide our behavior, both on a physiological and social-communicative level (Lerner & Keltner, 2001). Furthermore, CATF suggests that these reactivated emotion patterns save us cognitive processing energy (Averill et. al, 1994).

The Feelings as Information Theory propose that people rely on their current emotional state as information, to help them make judgments (Schwartz et. al, 2011). A flaw in this heuristic way of processing information is that people are more willing to trust their emotions than to



critically examine its source (ibid.). The second step here of determining whether the emotional experience is relevant in the given situation for the judgment is often neglected (Schwartz et. al, 2011). The whole process of using feelings as information is happening without our awareness. As soon as we realize the impact of the current emotion, we start searching for more alternatives to make a more informed judgment (Schwartz et. al, 2011). Since these theories are central in emotion and decision-making research, we formed our hypothesis based on The Carry-Over Effect, CATF, and The Feelings as Information Theory. If these theories are true when combined, another conclusion will be that emotions influence our judgments in a way that is biased towards the discrete emotion that we are currently experiencing.

## **2.2 Definition of discrete emotions.**

The nature of emotions and their origin is an ongoing debate where emotion researchers take several different perspectives. From a constructive perspective on emotions, Barret and colleagues describe emotions as events of multifaceted experiences that take physiological expressions (Barret et. al, 2007). They arise from neurological processes within us and are constantly reactive to our environment and body (ibid.). From an evolutionary perspective, Ekman and other emotion researchers believe that some emotions are universal. According to The Discrete Emotion Theory, there are several basic/core/discrete emotions. Those emotions are innate and universal, and they are distinguishable based on neural, physiological, behavioral, and expressive features (Colombetti, 2009). The most well-known basic emotions are fear, anger, joy, sadness, disgust, and surprise (Ekman, 1992). In this paper, we focus on Discrete Emotion Theory to define discrete emotions. However, we welcome other researchers to test the constructivist perspective on emotion to investigate more possible outcomes.

## **2.3 Definition of anger.**

As mentioned above, anger is one of the basic emotions (Ekman, 1992). In valence dimensions, anger is classified as a negative emotion and characterized by its score on cognitive appraisal dimensions, e.g., anger scores high on certainty, anticipated effort, individual control, and others' responsibility, while it scores low on pleasantness and medium on attentional activity (Lerner & Keltner, 2000). Anger is characterized by dissatisfaction and a motivation to change the situation (Frijda et. al, 1989). Angry people tend to want to

remove obstacles and recreate the situation as it was before the scenario causing the trouble occurred (Angie et. al, 2011).

### 3 Previous research

Eliciting participants with angry emotions has been shown to make their judgments superficial since anger mediates processing with a fewer number of cues (Lerner et. al, 1998). Angry participants increased the punishment levels made in an experiment on judgments around justice (ibid.). Anger mediates a superficial processing style, where heuristics and stereotypes are more common and the rhetoric style steals attention at the expense of critically examining the content of the arguments (Bodenhausen et al. 1994, Petty & Cacioppo, 1986). Another study exploring minimal ingroups and outgroups and induced emotions found that participants induced with anger were most prejudiced against outgroups (Desteno et. al, 2004). Desteno and colleagues consider one explanation for this to be that experiencing anger might evoke competition and increase suspiciousness towards enemies (ibid.).

Several studies show that anger influences judgment regarding risks (Litvak et. al, 2010). One study found that anger, compared to neutral or sad, increased optimism in participants. This was expressed as a sort of false cover when estimating how painful consequences they might experience in different given scenarios (Hemenover & Zhang, 2004). In another study, angry participants were overly optimistic in a nervous sense, when making judgments regarding how likely they were to experience different risks and traumas in life (Lerner & Keltner, 2001). Anger also distorted the perception of risk to an exaggeration, concerning the number of people who annually die in different ways in the US (Lerner & Keltner, 2000). However, none of these studies have used video clips to elicit anger. Video clips have been shown to elicit discrete emotions such as anger in a more effective way than using text or music (Gross & Levensson, 1995; Zupan & Babbage, 2017).

## 4 Method

### 4.1 Design.

Our experiment was created with an independent group design. Participants were randomly assigned to one of two conditions. The independent variable was the anger or neutral emotional state elicited by video clips. The dependent variable was the risk and aggression judgment made by the participants. The experiment was created in PsyToolKit (Stoet, 2017, 2020). Based on previous meta-analysis findings of effect sizes, we were seeking a possible medium effect size (Angie et. al, 2011).

#### 4.1.1 Pilot Study.

The emotional time resolutions are short. Therefore the experiment design needed to fit within the time scope of 1-10 minutes (Coan & Allen, 2007, Gneezy & Imas, 2014).. For this reason, we had randomly chosen 25 out of 120 statements from (Buss et. al, 1992) and (Weber et. al, 2002). We picked the questions from different question domains, to achieve a sensitivity towards many personality traits and different scenarios. To make sure that the statements were understandable to non-native English speakers, we conducted a qualitative pilot study. Additionally to the previous purpose, the pilot study helped us to check if the instructions and information were easy to follow, as well as how the video clips' stimuli were experienced.

Three participants (2 female, 1 male) in the age range of 24-27 participated in the pilot study and were asked some questions after completing the study. These questions were: *Could you follow the instructions without any difficulties? Did you understand the 25 statements you just read? Was it something in the experiment that you did not understand? How did you experience the video clips' stimuli?* The feedback we got from the pilot study informed us that two of the statements were ambiguous on the phrasing level and hard to understand. These statements were replaced with two other statements from the same domain. We also got feedback regarding the video clips, participants found the neutral video clips stimuli confusing. This was assessed by adding a few seconds between the clips and adding headings such as Video 1, Video 2, etc. in between all clips to avoid confusion. These changes improved our tools for the main study.

## **4.2 Participants.**

130 participants from 22 different countries took part in the study. We had 65 participants in the first condition (The anger video clip) and the other 65 participants in the second condition (The neutral video clips). The participants were 47 men, 80 women, and 3 others, between the ages of 18 and 81, with a median age of 29. The participants were recruited via social media platforms such as Facebook, Instagram, Reddit, and Linked-in, and they could participate only once in the study. No compensation was given.

## **4.3 Material.**

### **4.3.1 Video clips as an emotional elicitation tool.**

Using films is an effective way of inducing emotions (Zupan & Babbage, 2017) giving a multisystem response arising from physiological, behavioral, and emotional experiences (Coan & Allen, 2007). The film *My Bodyguard* by Tony Bill (1980) has reported high levels of angry emotions in several studies (Hewig et. al, 2005; Gilman et. al, 2017; Gross & Levensson, 1995, Sambardo et.al, 2020), and therefore it was chosen as the angry stimuli in this study.

For the neutral video stimuli, we used a combination of five separate short video clips. From the list of recommended clips (Gross & Levensson, 1995) we used; Sticks Screensaver that shows colors and changing shapes, and clips from the film *Blue* by Derek Jarman (1993) and *The Lover* by Claude Berri (1992) containing people moving, traveling in cars or walking (Schaefer et al., 2010), all films can be found in appendix 1. The neutral video stimuli had a numeral distinction between each one of the clips, indicating which video the participant is going to watch e.g. (video 1, video 2, video 3...). The neutral video clips' validity has been confirmed as evoking a neutral to mild pleasant response in eliciting emotions (Schaefer et al., 2010).

The reason that the neutral clips were mixed into one stimulus was to achieve a material as similar as possible in terms of length. The video clips were 4 minutes and 3 minutes in length for the anger and neutral video stimuli respectively. Shorter video clips have been used more effectively than longer clips to induce emotions (Coan & Allen, 2007). The videos were edited from feature films according to prior emotion researchers' recommendations to evoke neutral and angry emotions (Gross & Levensson, 1995).

The criteria we used for selecting video clips were; all video clips must have been proven to have a significant effect in eliciting emotions, have been tested in experiments, and have been included in the database for recommended emotion eliciting films. The video clips should also be equal in length, have a dynamic real-world setting and it should include people. These criteria were met on 4 out of 5 of the neutral clips and in the anger clip. The clip Sticks not including people were needed to achieve a similar length.

#### **4.4 Tools to measure judgment.**

Our tool to measure judgment was a questionnaire consisting of a total of 25 statements. In the design of this study, we chose 21 questions out of 91 (Weber et. al, 2002), and 4 questions from Buss and colleagues (Buss et. al, 1992). As mentioned earlier, the reason why we customized this questionnaire to 25 questions was that the emotional time resolutions are short. Therefore the experiment needed to fit within the time scope of 1-10 minutes, as this is the approximate estimated life length of induced emotions (Coan & Allen, 2007, Gneezy & Imas, 2014).

The statements are categorized under Risk or Aggression categories. In the risk category, we had five main domains: financial, health/safety, recreational, ethics, and social decisions (Weber et. al, 2002). Three statements were assessing risky financial behaviors, six statements assessing health/safety behaviors, five statements assessing risky ethical behaviors, and three and four statements measuring recreational and social decisions, respectively (Weber et. al, 2002). The remaining four statements assessed aggressive behaviors (Buss et. al, 1992).

Weber and colleagues have refined their risk questionnaire through several replications to improve the domains and questions assessing risk judgments (Weber et. al, 2002). A strength in this development is that they found evidence supporting that risk-taking is domain-specific, rather than belonging straight to a personality trait (Weber et. al, 2002). The original Likert scale went from extremely unlikely to extremely likely with five steps (ibid.). We adjusted this to seven steps to improve its sensitivity.

#### **4.5 Procedure.**

We started our recruiting process by sharing a link to the study on social media. By clicking on the link, a new webpage opened on the device of the participant. This page contained

general information and instructions about the study. To conceal the actual research purpose the description of the study was presented as attitudes. If the participant wanted to take part in the study, he\she\other needed to give clear consent and then the study started. The first thing happening when the study started was that participants provided us some information about themselves, such as their sex and age. The next step was the random assigning of them into one of two groups, group 1 was the anger condition and group 2 was the neutral condition.

In the anger condition, individuals were shown a video clip to elicit anger. Then they answered a questionnaire of 25 questions assessing the likelihood of them engaging in some risky or aggressive activities. In the neutral condition, individuals were shown a video clip to put them in a neutral emotional state. Then they answered a questionnaire of 25 questions assessing the likelihood of them engaging in some risky or aggressive activities. When the questions were answered, our participants received a thanks note, and their data was stored automatically. The final step was to analyze the data with the help of the SPSS program version 27.

#### **4.6 Ethics.**

The goal of evoking emotions in other people comes with ethical responsibility. Notably, this may arouse other intense emotions from previous experiences. However, this is assured to be ethically justified through asking for participants' consent and letting them know that they can quit at any time and that all their information and responses are anonymized. Regarding copyright for the commercial films used in the experiment, this would most likely pass within the exceptions of copyright for educational purposes. Internationally this would be classified as fair use. "The statute provides that fair use of a work "for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use, scholarship, or research)" is not an infringement of copyright."(gov.us, 2021). In Sweden, the corresponding paragraph is called återgivningsrätt. This is part of paragraph 23, the legal right to recite someone else's artwork (SFS 1960:729). Our application of recitation of short clips from the films is undoubted without commercial interests and a part of an educational program. This is sufficient to be a solid legal motivation both in Sweden and within the notion of international law.

## 5 Results

An independent-samples t-test was conducted to compare the effect of the anger state and neutral state in our judgments. There was no significant effect between the anger state (M=3.35, SD= 0.82) and neutral state (M= 3.28, SD= 0.74) conditions;  $t(128) = 0.50, p>0.05$ .

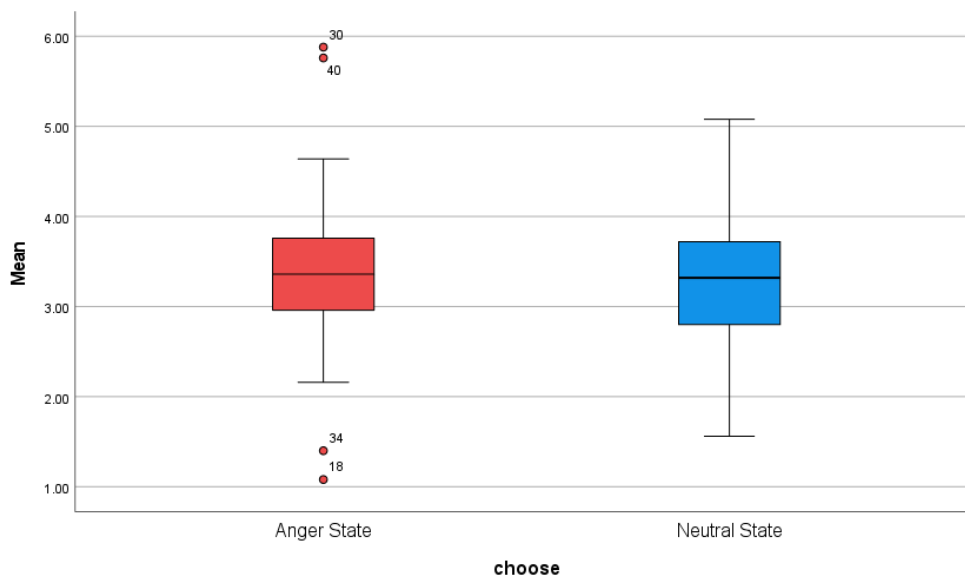


Figure (1)

Figure (1) Shows a boxplot of the mean value of the 25 questions used in the study.

We hypothesized that individuals in an angry emotional state will be more likely to engage in risky and aggressive behavior than individuals in a neutral emotional state. Our results suggest that we could not find support for this hypothesis.

To analyze the result in more depth, an additional t-test was conducted for each of the questions. The result of this test showed that 23 of the questions had no significant effect and two questions had a significant effect. These two questions were: “Exploring an unknown city or section of town?” (Question number 20, recreational domain), together with “Taking a job where you get paid exclusively on a commission basis?” (Question number 25, financial domain). According to the result, participants in the angry emotional state were more willing to explore an unknown city, question number 20, with a mean value of (M= 5.74, SD= 1.59), compared to the neutral emotional state (M= 5.03, SD=1.94);  $t(128) = 2.27, p>0.02$ . This was also true for question number 25, taking a job with payment exclusively on commission, where the angry emotional state group showed (M=2.65, SD=1.63) compared to the neutral emotional state (M=1.97, SD=1.35);  $t(128) = 2.58, p>0.01$ .

Group Statistics					
	choose_random	N	Mean	Std. Deviation	Std. Error Mean
Question20	Anger State	65	5.74	1.594	.198
	Neutral State	65	5.03	1.944	.241
Question25	Anger State	65	2.65	1.634	.203
	Neutral State	65	1.97	1.357	.168

Figure (2)

Figure (2) Shows the mean value of question number 20 and question number 25 used in the study.

Tables showing more results can be found in appendix 3.



## 6 Discussion

### 6.1 Relevant findings and issues.

Our result unfolded some relevant findings in an analysis of the separate effects for each question. Worth noticing is that out of 25 questions two had a significant effect. These two questions were: how you would judge the likelihood of “Exploring an unknown city or section of town” (Question number 20, recreational domain). Together with “Taking a job where you get paid exclusively on a commission basis” (Question number 25, financial domain). This result could motivate a replication with questions from these two domains.

In the design of this study, we chose 21 questions out of 90, belonging to Weber and colleagues’ risk judgments. The procedure of picking some questions could have demolished the effectiveness of the original tool. Moreover, we adjusted the original scale from a five-point scale to a seven-point scale to improve its sensitivity. This might also have affected its precision negatively. Another discovery was that within risk judgments there might exist a bias between the sexes, where one sex is less risk averse in many domains. For researchers investigating judgments on risk behavior, this could be an interesting parameter to test in future research. Furthermore, the combination of aggression and risk judgments could also have negatively affected the power of the scale as a tool. An extra pilot study investigating the survey questions attentively would have served this study well.

### 6.2 Possible confounder.

A few possible confounders related to the experimental setup were identified. Between participants, individual differences in personality characteristics might have been an issue. Traits as extraversion or introversion may have affected how reactive neurological baselines they had towards an emotional stimulus. This was not a part of the goal to determine in this study and this should be balanced by the random group design. However, we welcome further studies to include individual personality differences when studying anger and other emotions that influence judgments.

When it comes to the emotions eliciting database, the films included there are mostly validated through self-reports. This type of measurement can be biased by social desirability. The validity of this film eliciting database could have been tested more robustly, by combining self-reports with physiological responses and brain scanning. Additionally, the

outdated production date of the films we used might be considered as a confounder. The film set from Gross & Levenson consists mostly of films from the eighties and nineties. This could result in a less infectious emotion elicitation to young participants, considering the films might be outdated. Recognition of the films might also have caused problems. If participants recognized the films, actors, or have watched the films before this might influence their attitudes and emotions towards the video clips. This could have been solved by asking participants if they have seen films before at the end of the study. Then those participants who answered with yes could have been considered as outliers.

### **6.3 Experiment design setup issues.**

In the experiment design, we found flaws in our instructions regarding the procedure. To completely avoid confusion, we should have explicitly mentioned in the instructions that no breaks should be taken. This could have been solved by emphasizing the need to continue with the survey questions immediately after watching the video, without taking a break. There is a risk that we might have missed actual significant effects, due to the shortage of our instructions. The time resolution of eliciting emotions is short, and therefore this applies to those participants who might have taken a break. Their anger might have faded quickly before they continued and therefore was not discovered. Moreover, asking the participants at the end of the survey, how they felt, would have been valuable to the validity of the design.

Additionally, the design setup could have another flaw. The anger and the neutral emotional state might have been interrupted by the need to reflect on some of the questions in the questionnaire before making a judgment. This might have forced the participants to switch to another processing mode. One possible way to control this is by measuring the emotional experiences as they are happening during the whole experiment. This could be done by asking questions about how the participants feel or by measuring their physiological biomarkers, several times in the experiment. However, we did not use this method since we identified the additional questions and the biomarkers as a risk of stealing attentional resources from participants during the experiment. This exemplifies the limits on the complexity set up possible for online experiments, which surely is a methodological shortage. Another factor that conceivably could have impacted the result was that the neutral and anger films differed slightly in story and length.

## **6.4 Implications for further research.**

This experiment had participants from 22 different countries which clearly represents many cultural perspectives. This makes it a representative sample considered ethnicity. Another strength of this experiment is that video clips as an emotion eliciting method are highly standardized, in a way that laboratory studies can hardly achieve. This control allows for replications for future studies. The film scenarios also resemble real-life events well, giving them ecological validity.

However, one problem with this study was the complex nature of emotions and the difficulty to measure them. We cannot be completely sure where one emotion ends and another one begins. This means that it is hard to control when anger is the only present emotion that is influencing judgments. Most likely we constantly have a mixture of several emotions, in different intensity. Additional research could assess this ambiguity by using different measurements such as fMRI, eye tracking, body language, galvanic skin response combined with more psychological self-assessment scales. For future related online studies, a combination of emotion eliciting methods e.g. (listening to music, reading text, or writing about your memories) could be used to ensure that anger is evoked in participants. To increase the external validity, it might be possible to test for induced emotional impact on judgments in office environments.

To us, judgment was the most interesting part of the decision-making process to study. Since this can be considered the first step of the decision-making process based on previous research. Judgment is connected to the way we constantly perceive and reflect upon our surroundings; this can be seen as the engine behind the actual decision-making and the behavior that is later executed.

## 7 Conclusion

This study was conducted to investigate how eliciting anger through video clips might influence risk and aggression judgments. We hypothesize that individuals in an angry emotional state will be more likely to engage in risky and aggressive behavior than individuals in a neutral emotional state. Even though our data did not show that anger, as the chosen emotion for this study, had a significant effect on judgments, we still believe that there is an effect. In the future, this needs to be studied with different tools and methods to prove its existence. Once it is proven scientifically, then in a bigger perspective, this knowledge might help us understand the biases occurring in the judgment processes on a societal level. Further emotions could influence the judgment within politics, law, international relations, and policymaking on a global scale. This will make this field of research highly important as our cognitive processes constantly are shaping our future together.

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# 9 Appendices

## 9.1 Appendix 1

Appendix 1 includes the emotion eliciting video clips.

The following links will allow you to watch or to download the anger emotion eliciting video clip and neutral emotion eliciting video clip that was used in the experiment.

### **Anger, Condition 1:**

<https://drive.google.com/file/d/1176AS2Z3lXvSW-erzZTOoehi5yziH6cJ/view?usp=sharing>

### **Neutral, Condition 2:**

[https://drive.google.com/file/d/1ooc1esdxViMZTSlsa5O\\_cCIE9tKydhFp/view?usp=sharing](https://drive.google.com/file/d/1ooc1esdxViMZTSlsa5O_cCIE9tKydhFp/view?usp=sharing)

## 9.2 Appendix 2

Appendix 2 includes a link to the experiment design and the questionnaire used to assess judgments.

### Link to the experiment:

<https://www.psychtoolkit.org/c/3.3.2/survey?s=hzZ9T>

### Questionnaire

1. Passing off somebody else's work as your own. (E)
2. Walking home alone at night in a somewhat unsafe area of town. (H)
3. When people annoy me, I may tell them what I think of them. (Aggression aversion)
4. Forging somebody's signature. (E)
5. I can't help getting into arguments when people disagree with me. (Aggression aversion)
6. Buying an illegal drug for your own use. (H)
7. Cheating on an exam. (E)
8. Taking a day's income to play the slot-machines at a casino. (F)
9. I am suspicious of overly friendly strangers. (Aggression aversion)
10. I tell my friends openly when I disagree with them. (Aggression aversion)
11. Not having a smoke alarm in or outside of your bedroom. (H)
12. Approaching your boss to ask for a raise. (S)
13. Illegally copying a piece of software. (E)
14. Shoplifting a small item (e.g. a lipstick or a pen). (E)
15. Engaging in unprotected sex. (H)
16. Trying bungee jumping. (R)
17. Defending an unpopular issue that you believe in at a social occasion. (S)
18. Exposing yourself to the sun without using sunscreen. (H)
19. Going camping in the wild. (R)
20. Exploring an unknown city or section of town. (R)
21. Ignoring some persistent physical pain by not going to the doctor. (H)
22. Arguing with a friend about an issue on which he or she has a very different opinion. (S)
23. Spending money impulsively without thinking about the consequences. (F)
24. Moving to a new city. (S)
25. Taking a job where you get paid exclusively on a commission basis. (F)

E = ethical, **5**

F = financial, **3**

H = health/safety, **6**

R = recreational, **3**

S = social items, **4**

+

Aggression aversion **4**

### 9.3 Appendix 3

Appendix 3 includes statistical result tables from our analysis made in SPSS version 27.

#### 9.3.1 Group Statistics Results examining all 25 questions

Group Statistics					
	choose_random	N	Mean	Std. Deviation	Std. Error Mean
Question1	Anger State	65	1.77	1.487	.184
	Neutral State	65	1.75	1.186	.147
Question2	Anger State	65	3.14	1.685	.209
	Neutral State	65	3.58	1.936	.240
Question3	Anger State	65	3.98	1.867	.232
	Neutral State	65	3.43	1.704	.211
Question4	Anger State	65	1.65	1.576	.195
	Neutral State	65	1.82	1.446	.179
Question5	Anger State	65	3.12	1.644	.204
	Neutral State	65	3.32	1.602	.199
Question6	Anger State	65	2.08	1.797	.223
	Neutral State	65	2.15	1.831	.227
Question7	Anger State	65	2.34	1.680	.208
	Neutral State	65	2.42	1.767	.219
Question8	Anger State	65	1.35	.959	.119
	Neutral State	65	1.37	1.054	.131
Question9	Anger State	65	3.91	1.869	.232
	Neutral State	65	4.14	1.657	.206
Question10	Anger State	65	5.11	1.706	.212
	Neutral State	65	4.74	1.770	.220
Question11	Anger State	65	3.35	2.348	.291
	Neutral State	65	3.52	2.425	.301
Question12	Anger State	65	3.18	1.836	.228
	Neutral State	65	3.57	1.811	.225
Question13	Anger State	65	3.23	2.037	.253
	Neutral State	65	2.95	2.154	.267
Question14	Anger State	65	1.55	1.415	.175
	Neutral State	65	1.55	1.335	.166
Question15	Anger State	65	2.95	2.146	.266
	Neutral State	65	3.35	2.183	.271
Question16	Anger State	65	3.62	2.343	.291
	Neutral State	65	3.22	2.362	.293
Question17	Anger State	65	4.28	1.924	.239
	Neutral State	65	3.98	1.816	.225
Question18	Anger State	65	4.88	1.841	.228
	Neutral State	65	4.51	2.040	.253
Question19	Anger State	65	4.57	2.291	.284
	Neutral State	65	3.82	2.121	.263
Question20	Anger State	65	5.74	1.594	.198
	Neutral State	65	5.03	1.944	.241
Question21	Anger State	65	4.06	1.999	.248
	Neutral State	65	4.29	1.809	.224
Question22	Anger State	65	4.26	1.761	.218
	Neutral State	65	4.32	1.697	.210
Question23	Anger State	65	2.72	1.833	.227
	Neutral State	65	2.71	1.765	.219
Question24	Anger State	65	4.48	2.077	.258
	Neutral State	65	4.71	1.958	.243
Question25	Anger State	65	2.65	1.634	.203
	Neutral State	65	1.97	1.357	.168

**Table 1.**

Table 1 shows the *mean*, the *standard deviation*, and *standard error mean* value of each of the 25 questions.

### 9.3.2 Comparison of Score Values in the Group Statics

Group Statistics					
	choose_random	N	Mean	Std. Deviation	Std. Error Mean
Mean value of 25 questions	Anger State	65	3.3588	.82116	.10185
	Neutral State	65	3.2892	.74565	.09249

**Table 2.**

Table 2 shows the *mean*, the *standard deviation*, and *standard error mean* value of 25 questions.

### 9.3.3 Results of the Independent Samples T-Test for each Question

		Independent Samples Test									
		Levene's Test for Equality of Variances				t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
									Lower	Upper	
Question1	Equal variances assumed	.546	.461	.065	128	.948	.015	.236	-.451	.482	
	Equal variances not assumed			.065	121.974	.948	.015	.236	-.452	.482	
Question2	Equal variances assumed	1.447	.231	-1.402	128	.163	-.446	.318	-1.076	.184	
	Equal variances not assumed			-1.402	125.619	.164	-.446	.318	-1.076	.184	
Question3	Equal variances assumed	1.300	.256	1.767	128	.080	.554	.314	-.067	1.174	
	Equal variances not assumed			1.767	126.958	.080	.554	.314	-.067	1.174	
Question4	Equal variances assumed	.003	.958	-.638	128	.525	-.169	.265	-.694	.356	
	Equal variances not assumed			-.638	127.067	.525	-.169	.265	-.694	.356	
Question5	Equal variances assumed	.071	.790	-.702	128	.484	-.200	.285	-.763	.363	
	Equal variances not assumed			-.702	127.913	.484	-.200	.285	-.763	.363	
Question6	Equal variances assumed	1.260	.264	-.242	128	.809	-.077	.318	-.706	.553	
	Equal variances not assumed			-.242	127.956	.809	-.077	.318	-.706	.553	
Question7	Equal variances assumed	.003	.956	-.254	128	.800	-.077	.302	-.675	.521	
	Equal variances not assumed			-.254	127.674	.800	-.077	.302	-.675	.521	
Question8	Equal variances assumed	.033	.857	-.087	128	.931	-.015	.177	-.365	.334	
	Equal variances not assumed			-.087	126.869	.931	-.015	.177	-.365	.334	
Question9	Equal variances assumed	.982	.324	-.745	128	.458	-.231	.310	-.844	.382	
	Equal variances not assumed			-.745	126.199	.458	-.231	.310	-.844	.382	
Question10	Equal variances assumed	.025	.876	1.211	128	.228	.369	.305	-.234	.973	
	Equal variances not assumed			1.211	127.825	.228	.369	.305	-.234	.973	
Question11	Equal variances assumed	.271	.603	-.404	128	.687	-.169	.419	-.998	.659	
	Equal variances not assumed			-.404	127.869	.687	-.169	.419	-.998	.659	
Question12	Equal variances assumed	.064	.800	-1.202	128	.231	-.385	.320	-1.018	.248	
	Equal variances not assumed			-1.202	127.976	.231	-.385	.320	-1.018	.248	
Question13	Equal variances assumed	.435	.511	.753	128	.453	.277	.368	-.451	1.004	
	Equal variances not assumed			.753	127.604	.453	.277	.368	-.451	1.004	
Question14	Equal variances assumed	.000	1.000	.000	128	1.000	.000	.241	-.477	.477	
	Equal variances not assumed			.000	127.573	1.000	.000	.241	-.477	.477	
Question15	Equal variances assumed	.652	.421	-1.053	128	.294	-.400	.380	-1.151	.351	
	Equal variances not assumed			-1.053	127.964	.294	-.400	.380	-1.151	.351	
Question16	Equal variances assumed	.082	.776	.969	128	.334	.400	.413	-.417	1.217	
	Equal variances not assumed			.969	127.992	.334	.400	.413	-.417	1.217	
Question17	Equal variances assumed	1.308	.255	.891	128	.375	.292	.328	-.357	.942	
	Equal variances not assumed			.891	127.569	.375	.292	.328	-.357	.942	
Question18	Equal variances assumed	.894	.346	1.083	128	.281	.369	.341	-.305	1.044	
	Equal variances not assumed			1.083	126.685	.281	.369	.341	-.305	1.044	
Question19	Equal variances assumed	.789	.376	1.947	128	.054	.754	.387	-.012	1.520	
	Equal variances not assumed			1.947	127.242	.054	.754	.387	-.012	1.520	
Question20	Equal variances assumed	5.461	.021	2.270	128	.025	.708	.312	.091	1.325	
	Equal variances not assumed			2.270	123.253	.025	.708	.312	.090	1.325	
Question21	Equal variances assumed	.639	.426	-.690	128	.491	-.231	.334	-.892	.431	
	Equal variances not assumed			-.690	126.744	.491	-.231	.334	-.893	.431	
Question22	Equal variances assumed	.743	.390	-.203	128	.840	-.062	.303	-.662	.539	
	Equal variances not assumed			-.203	127.821	.840	-.062	.303	-.662	.539	
Question23	Equal variances assumed	.014	.907	.049	128	.961	.015	.316	-.609	.640	
	Equal variances not assumed			.049	127.820	.961	.015	.316	-.609	.640	
Question24	Equal variances assumed	.041	.839	-.652	128	.516	-.231	.354	-.931	.470	
	Equal variances not assumed			-.652	127.556	.516	-.231	.354	-.931	.470	
Question25	Equal variances assumed	6.465	.012	2.569	128	.011	.677	.263	.156	1.198	
	Equal variances not assumed			2.569	123.841	.011	.677	.263	.155	1.198	

**Table 3.**

Table 3 shows a t-test analysis for each question. The red marked boxes are the questions that show a significant effect.



### 9.3.4 Results from T-test Analysis

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Mean value of 25 questions	Equal variances assumed	.029	.864	.505	128	.614	.06954	.13758	-.20268	.34176
	Equal variances not assumed			.505	126.827	.614	.06954	.13758	-.20271	.34178

**Table 4.**

Table 4 shows a t-test analysis of 25 questions with no significant effect.