

Dealing with Controversy: An Emotion and Coping Strategy Corpus Based on Role Playing

Enrica Troiano^{1,2*}, Sofie Labat^{3*}, Marco Antonio Stranisci^{4,5*},
Viviana Patti⁴, Rossana Damiano⁴ and Roman Klinger⁶

¹Computational Linguistics and Text Mining Lab, Vrije Universiteit Amsterdam, Netherlands

²HK3Lab, Rovereto, Italy

³LT3, Language and Translation Technology Team, Ghent University, Belgium

⁴Dipartimento di Informatica, Università degli Studi di Torino, Italy

⁵aequa-tech, Turin, Italy

⁶Fundamentals of Natural Language Processing, University of Bamberg, Germany
{firstname.lastname}@{hk3lab.ai, ugent.be, unito.it, uni-bamberg.de}

Abstract

There is a mismatch between psychological and computational studies on emotions. Psychological research aims at explaining and documenting internal mechanisms of these phenomena, while computational work often simplifies them into labels. Many emotion fundamentals remain under-explored in natural language processing, particularly how emotions develop and how people cope with them. To help reduce this gap, we follow theories on coping, and treat emotions as strategies to cope with salient situations (i.e., how people deal with emotion-eliciting events). This approach allows us to investigate the link between emotions and behavior, which also emerges in language. We introduce the task of coping identification, together with a corpus to do so, constructed via role-playing. We find that coping strategies realize in text even though they are challenging to recognize, both for humans and automatic systems trained and prompted on the same task. We thus open up a promising research direction to enhance the capability of models to better capture emotion mechanisms from text.

1 Introduction

In the last decades, natural language processing (NLP) has examined the interaction between language and emotions from different angles, including text generation and understanding (Alhuzali and Ananiadou, 2021; Schmidt et al., 2021; Gao et al., 2021; Wang et al., 2022). This work has resulted in the creation of many resources for processing affect in text (Bostan and Klinger, 2018), largely based on psychological theories that treat emotions as either discrete labels or vectors in a space defined by the dimensions of valence, arousal

*The first three authors contributed equally.

Strategy	Example
Attack	Every word you said just proves how utterly clueless you really are. I won't tolerate your ideas anymore.
Contact	Allow me to disagree. I feel like your ideas might have fatal repercussions.

Table 1: Texts expressing different coping strategies.

and dominance (Ekman, 1992; Plutchik, 2001; Russell, 2012), enabling machine learning approaches to model emotions in the same manner (Buechel and Hahn, 2018; Demszky et al., 2020; Hipson and Mohammad, 2021). To date, however, much research disregards the complex mechanisms governing the emergence and subsequent effect of emotions on behavior, which are often conceptualized in psychology as coping processes (Lazarus, 1991a; Scherer, 1982). Essentially, emotions can be considered episodes where people *cope* with an event, and that influence their behavior through action tendencies (Lazarus, 1991b). According to Roseman (2013), this influence occurs in four generic ways: they correspond to the four coping strategies that people use to *attack* an emotion stimulus, *contact* it, *distance* themselves from it, or *reject* it, and each of them is contextual to feeling specific emotions – e.g., being disgusted by something aligns with the tendency to reject it, feeling love prompts to establish contact with the loved object.

Theories of coping have great visibility in research on virtual agents and robotics due to their ability to model emotions at the behavioral level (Spekman et al., 2018; Marsella and Gratch, 2009, i.a.), but their potential for studying emotions in language (as a specific type of behavior) has not been fully explored so far. In this paper, we pro-

pose to study textual emotions from the perspective of coping. As NLP moves towards investigating emotions as phenomena fundamentally centered on events (Klinger, 2023), automatic systems are required to understand how individuals cope with those events when feeling and verbally expressing an emotion. They thus urge us to question the way that coping strategies realize in language, and if they can be captured by computational models.

We hypothesize that these strategies, as essential building blocks of communication, emerge in text just like the emotions that they accompany (anger, hope, etc.). Intuitively, a text expressing anger should also convey the intention of attacking a stimulus, and one associated to hope might verbalize a contacting-type of coping (see Table 1 for some examples). Our study sets out to verify this assumption: we construct COPING (COPING emotionN strateGies), the first corpus focused on coping information, and we investigate the feasibility of the task of coping strategy detection.

We approach this task using dialogues that depict conflictual situations about topics of actual relevance, in which one interlocutor utters a controversial statement threatening one’s identity, and the other person fights against it while implementing a coping strategy. In ecological settings (e.g., on online platforms), finding interactions of this type annotated with coping information is hard. Hence, we gather them via crowdsourcing, building COPING with an experimental design for text generation and annotation based on role-playing. Role-play provides a methodologically founded way to elicit behavioral and linguistic responses by asking individuals to put themselves in the shoes of a fictional (yet credible) character, with whom they do not necessarily share concerns and values. In our case, people impersonate a character that portrays one of Roseman’s coping strategies, and produce text to disagree with an imaginary interlocutor.

Using COPING, we answer the following research questions. (RQ1) Can coping strategies be elicited in language and subsequently annotated? With a quantitative and qualitative analysis of the corpus, we show that this is the case – with some caveats deriving from our data collection procedure. (RQ2) Can coping strategies be identified automatically? To answer this question, we fine-tune models for the classification of coping strategies on COPING, and compare them to humans and four prompt-based Large Language Models (LLMs) per-

Coping Strategy	Emotions	Behavioral Function
Attack	Anger, frustration, guilt	Move against stimuli
Contact	Joy, hope, love, pride, relief	Increase contact and interaction with stimuli
Distance	Dislike, distress, fear, regret, sadness	Decrease contact and interaction with stimuli
Reject	Contempt, disgust, shame	Move stimuli away

Table 2: The four coping strategies with the corresponding emotion groups and behavioral functions, as in Roseman (2013).

forming the same task in a zero-shot setup.

In sum, our contribution is threefold. (1) We take an initial step to study the four coping categories that underlie the labels typically used in computational emotion analysis, driven by the taxonomy of attack, contact, distance, and reject that Roseman links to 16 emotions (see Table 2). (2) We release a highly-structured corpus, built with a novel strategy for the collection of emotion-centered information. (3) We introduce and benchmark the task of coping strategy identification. Experimental results support its viability.

Our corpus and code are available at <https://www.uni-bamberg.de/nlproc/ressourcen/emotioncoping>.

2 Related Work

We now summarize the concepts of coping and emotions, and related NLP research.

2.1 Coping Strategies and Emotions

According to well-established psychological theories, emotions emerge as a person evaluates, or appraises, salient situations (Scherer et al., 2001). For example, if someone receives a critical review, they might appraise it as a sign of failure and feel anxious, or appraise it as constructive and feel determined to improve. Within this theoretical framework, Roseman (2013) links emotions to coping, a process useful for “responding to situations of crisis and opportunity” (p.143).

More precisely, emotions are instances of the general strategies of *attack*, *contact*, *distance*, and *reject* (as in Table 2) that serve to seek more or less of a stimulus. For example, emotions like anger

and frustration correspond to the *attack* strategy by which people engage with a source of distress; hope and joy pertain to the *contact* strategy, which increases one’s interaction with the stimulus; fear and sadness belong to the *distance* strategy, that minimizes the source of distress; disgust and shame share a *reject* strategy to eliminate the stimulus.

Roseman’s theory is accompanied by others on the same matter, such as that of Lazarus and Folkman (1984), which sees coping as two simultaneous stages: (1) a person evaluates the motivational relevance and congruence of a situation in respect to their own goals: “How relevant and (in)consistent is the situation with my own needs/goals?” (Smith and Kirby, 2009); and (2) the situation is evaluated in terms of coping potential: “Which resources and options do I have for coping?” (Smith and Kirby, 2009). This theory further distinguishes between problem-focused and emotion-focused coping. Problem-focused strategies are directed at the stimulus (e.g., decreasing environmental pressures) or at the self (e.g., altering level of aspiration, Kahn et al., 1964), while emotion-focused coping involves cognitive processes that reduce emotional distress (e.g., avoidance or acceptance) or increase it to mobilize for action (Lazarus and Folkman, 1984). While the distinction between problem- and emotion-focused coping was criticized in later research for being non-exclusive and non-exhaustive (Skinner et al., 2003), the adoption of a theory that relies on the interaction between coping mechanisms and the corresponding emotions is promising to explore more in-depth computational approaches to emotion detection in NLP. We therefore follow the theory of Roseman (2013), which provides an exhaustive mapping of this type.

2.2 Psychological Theories and NLP

The majority of works in NLP have used discrete emotion categories to extrapolate from text, borrowed from theories such as Ekman’s (1992) and Plutchik’s (2001). There have also been successful efforts at identifying the underlying components of emotions, in terms of valence, dominance, and arousal (Mohammad, 2018; Park et al., 2021), following dimensional models of affect (e.g., Russell, 2012). Our work, however, is closer to a more recent research direction, which considers the interplay between emotions and their eliciting events to carry out a discussion and the modeling of ap-

praisals (Yeo and Jaidka, 2023; Zhan et al., 2023).

Related to that, some NLP works investigate re-appraisal (Uusberg et al., 2019), i.e., how people re-interpret a situation to alter its emotional impact (e.g., “When I realized I could listen to my podcast, I stopped feeling frustrated about the traffic jam.”). For instance, based on re-appraisal, Li et al. (2024) and Ziems et al. (2022) reframe texts that depict negative situations in a more positive manner. Similarly, we focus on emotion responses to data evoking adverse circumstances, but we use verbal stimuli that can distress the annotators (by describing scenarios with contentious interactions) in order to activate coping (similar to Saha et al. (2019) and Choi et al. (2020)). In doing so, we address the interplay between emotions and events via coping, providing the first corpus annotated with this phenomenon and exploring the effective emergence of Roseman’s strategies in text.

3 Data Creation Methodology

Textual data associated with coping strategies is hard to obtain. Ideally, since coping is a response to an appraised situation, both the situation itself and the textually expressed coping strategy should be known – but the former may be external to the text and impossible to track. Moreover, coping strategies rarely appear as naturally-occurring labels of texts (e.g., as hashtags assigned by writers), and they involve complex concepts which might be unfamiliar to laypeople (i.e., the psychological sense of *attack*, *contact*, *distance* and *reject*).

We solve these issues by resorting to a role-playing approach inspired by the paradigm of improvisational theater (Baumer and Magerko, 2009) and supported by research on character identification (Giovannelli, 2009; Battaglino et al., 2014): instead of annotating existing data, participants engage in a make-pretend activity in which they write new texts while (purposefully) instantiating a given coping strategy.¹ We approximate the collection of data from first-hand experiencers of coping.

We apply this approach as in Figure 1. We start by gathering the building blocks of the role-playing study (Section 3.1), namely, definitions for the four strategies and texts depicting scenarios in which these might be triggered. Based on such definitions and scenarios, we stimulate the production of coping-expressing utterances (Section 3.2).

¹Workers are recruited on Prolific, <https://www.prolific.com>.

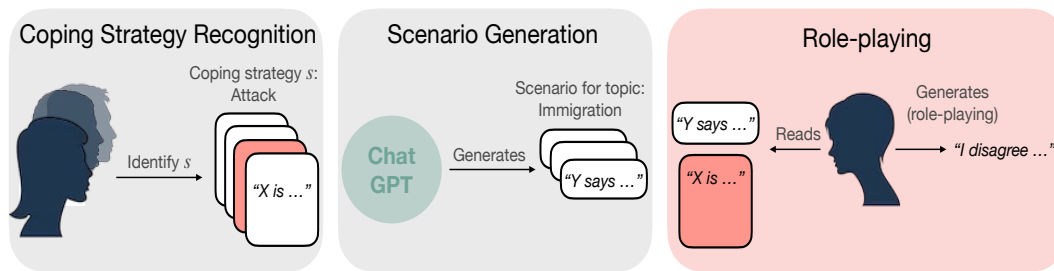


Figure 1: Crowdsourcing methodology. Grey boxes: collecting the building blocks for role-playing. Annotators identify the coping strategy s (in the figure, attack) in the description of character X ; separately, ChatGPT-4 produces scenarios for different topics (in the figure, immigration). Pink box: role-playing. A character description and a scenario on a given topic are presented to annotators as textual prompts to induce coping-related text generation.

3.1 Building Blocks of Role-playing

Good definitions of the strategies under consideration retain Roseman’s insights and minimize his technical jargon. We thus formulate each strategy s as the profile of a fictional character called X , who has all idiosyncrasies of that s . We use these descriptions² to crowdsource the task of coping strategy recognition, where people infer a coping strategy from a given description of s . This labeling task t can be conceptualized as estimating $p(s \mid \text{description}(s))$, and it serves as a pretest for the subsequent crowdsourcing phase of text generation and annotation (Section 3.2). The rationale is that the annotators’ performance will signal the quality of the description: the more a description is mapped to the correct s , the clearer it is.

As for the scenarios, we start from the idea that coping occurs in moments of crisis and opportunity. Hence, we identify five topics of current social relevance which might spur emotions and personal stances, i.e., abortion, immigration, racism, LGBTQ+ rights, and drugs. We generate three controversial scenarios for each of them, in the form of fictional dialogical settings where an interlocutor puts forward a contentious argument. An example of a coping definition and scenario is in Table 3.

Coping Strategy Recognition: Pretesting X ’s Descriptions. Our goal is to observe if crowdworkers associate X with the correct coping strategy: presented with a description of X , the annotators pick one of four possible strategies. We conduct this task in four rounds, each time modifying both the descriptions of X , and the set of possible answers presented to the annotators.³ From

²Descriptions are in Appendix A, with guidelines (Table 8) and results (Figures 3 and 4, Tables 9 and 10).

³Initially, the four answer options comprised the coping strategy labels (e.g., *attack*); later, we opted for one-line sum-

the candidate descriptions collected in all rounds, we select the four that elicit the highest annotation accuracy (attack and contact: 100% participants recognized the correct strategies, distance: 92%, reject: 52%). We use those to write the guidelines for the role-playing task of Section 3.2.

Scenario Generation. The scenarios are gathered via ChatGPT-4 to mitigate our personal and cultural stances.⁴ We ask the LLM to produce three descriptions of every-day situations (e.g., meet-ups in a bar), in which participants X and Y interact, and Y utters a strong opinion on a sensitive topic. ChatGPT-4 is required to specify the power status between X and Y (i.e., they are either two peers, or have a power imbalance), as we assumed that the way people respond to Y could depend on what relationship they hold with such interlocutor.

3.2 Role-Playing

We obtain texts associated with coping strategies by crowdsourcing task $t' = p(\text{generation} \mid t)$: participants⁵ generate text based on their understanding of a description of s . Their assignment is not only to form a mental representation of X and write a text: they must impersonate X and write as X would, in such a way that the resulting text discloses X ’s personal features. Since X represents a coping strategy, we assign the texts so collected to the corresponding s .

In practice, we collect the texts with 60 questionnaires, each mapping to a combination of a description of X and a scenario on a given topic. All questionnaires ask participants to map the de-

maries of X ’s profile – e.g., *X directly approaches problems with a potentially conflicting attitude (i.e., X is an attacking-kind of person)*.

⁴All prompts for ChatGPT-4 are in Appendix B, Table 11; the generated scenarios for each topic in Table 12.

⁵These workers do not overlap with those in Section 3.1.

Definition	This character comes across as a calm, understanding, and very approachable person. For X, communication serves to unite people. It is an opportunity to exchange opinions, acknowledging the diversity of perspectives among individuals. When problems or unpleasant situations arise, this character responds with a constructive attitude. X expresses ideas with confidence, trying to solve problems in a respectful manner. X can effectively engage in discussions also with people having contrasting opinions.
Scenario (topic: racism)	During a university class discussion on historical racial events, Y confidently states, “People keep talking about systemic racism, but I believe that’s just an excuse for those who don’t want to work hard. If you look around, everyone has the same opportunities today.”
Generated reply	I understand your point Y, but it is not the case for everyone. Our group is a select handful of people who have been brought up this way.
Additional annotations	Description of X’s non-verbal behavior; rating of X’s emotional responses; comparison with own reaction.

Table 3: Example description of X (i.e., definition for the coping strategy contact), with a scenario for the topic racism, and a text generated by a participant presented with the former, during the role-playing phase. The text is complemented with information on X ’s behaviors and emotions, and the participants self-reflection on their own.

scription of X to a short summary of X ’s profile (as in the previous task t). After the crowdworkers familiarize themselves with X , they read the scenario that includes the hostile interlocutor Y . Next, as sketched in Table 3, they: (i) generate a reply that opposes Y ’s statement by pretending they were X ; (ii) describe X ’s non-verbal reaction; (iii) rate the emotional response of X on a scale from 1 to 5 for each emotion in Roseman’s taxonomy. (iv) Lastly, participants are asked if they themselves would react verbally and non-verbally like X . If their answer is negative, they repeat the first three steps from their own perspective instead of X ’s.⁶ The 60 questionnaires are administered consecutively, with later versions featuring slight adjustments to the instructions for clarity, while maintaining consistency in both the tasks and the flow of questions.

We anticipated that responses to tasks (i) to (iv) might be influenced by both the participants’ role-playing abilities and their own involvement in the topic under consideration. Hence, to evoke bolder opinions, potentially resulting in clearer coping strategy expressions, we select participants with specific demographic features and assign them to a topic accordingly (e.g., LGBTQ+ scenarios are given to crowdworkers that belong to this community, and racism-based scenarios are presented to people self-assigning to an ethnic minority).

4 The COPING Corpus

COPING contains 1,200 data points, balanced among coping strategies, topics, and scenarios. On average, the length of X ’s answer to Y is 34.8 to-

kens⁷, that of texts about X ’s behaviors is 23.6. We now analyze the corpus to investigate if the four descriptions of X (such as that in Table 3) allow for a correct understanding of coping strategies. In doing so, this section answers **(RQ1) Can coping strategies be elicited in language and subsequently annotated?** We investigate coping understanding from different angles. First (Section 4.1), we do this irrespective of how the understanding reflects in text – to separate such an understanding from people’s ability to write utterances while role-playing. Then (Section 4.2), we question how well texts signal the presence of specific coping strategies.

4.1 Coping from the Perspective of Writers

Our work adheres to Roseman’s framework, but does so in an “artificial” experimental setup. We therefore test if the emotion judgments provided by participants are theoretically expected. If participants correctly impersonated X (for a given s), that has to reflect in a distribution of emotions similar to Roseman’s (cf. Table 2) – attack, e.g., should be associated to a high level of anger, frustration, and guilt. Further, we observe how such emotions are different from the annotators’ own emotions.

Emotions of Character X . Figure 2 illustrates the distribution of emotions per coping strategy. Different coping strategies are characterized by different emotion configurations: the mapping between Roseman taxonomy and the judgment of the crowdworkers is correct for most emotions (e.g., frustration, hope, dislike, contempt for attack, contact, distance, and reject respectively). There are

⁶Details on questionnaires and participants in Appendix C.

⁷Tokenization performed with spacy en_core_web_sm.

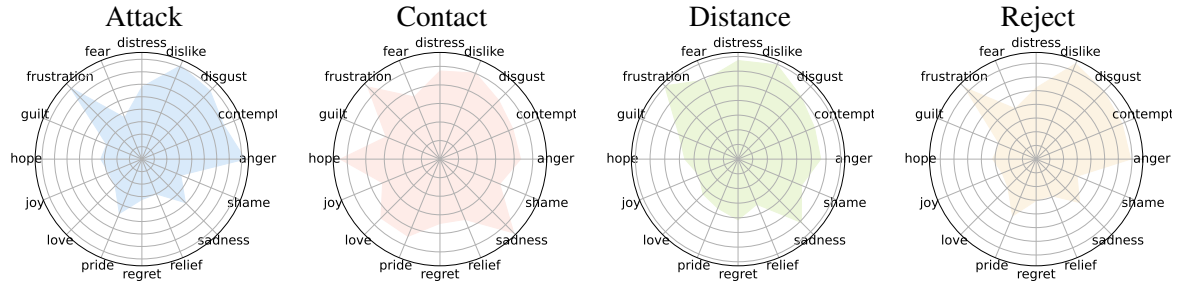


Figure 2: Emotion averages of character X for each coping strategy.

exceptions, however. For example, crowdworkers failed to associate guilt to attack, shame to reject, and love and relief to contact. Further, they assigned high values to, e.g., frustration in contact and anger in distance: while theoretically imprecise, such scores can be an effect of the scenarios presented to the crowdworkers, based on a hostile interlocutor and a communication setting that presumably induce negative emotions in X .

We corroborate these insights through correlations between emotions and coping strategies. We compute the Pairwise Cramér’s V association (Cramér, 1999) between the two variables, and deem them correlated only when $V > .3$ (i.e., moderate to strong correlations). To decide which coping strategy an emotion is most strongly associated with, we consider its average score, and assign it to the coping strategy where that average is the highest – e.g., anger correlates with attack because $V > .3$ and the average respondents’ rating is highest on that strategy (4.14) than any other. Results are in Table 4, where the emotion patterns underlying each strategy suggest that the crowdworkers achieved a sufficient level of understanding of character X . Six emotions (marked in bold) prove coherent with Roseman’s framework. For instance, frustration correlates with attack, hope with contact, fear with distance.

Vice versa, lacks of correlations for joy, pride, regret, relief, and sadness indicate that these emotions were not well identified by the participants. Rather than a negative outcome, we take this observation as an indicator of the success of role-playing, which made positive emotions such as joy and pride unlikely for X . Unsurprisingly, reject turns out uncorrelated to any emotion, since those documented by Roseman (i.e., contempt, disgust, and shame) are (incorrectly) more linked to other coping strategies. This outcome points not only at the difficulty for respondents to identify reject (cf.

Strategy	Emotion
attack	anger frustration contempt disgust dislike
contact	hope love
distance	distress fear shame guilt
reject	–

Table 4: Coping strategies and correlated emotions (Cramer’s $V > .3$). Emotions included in Roseman’s framework for a given strategy are marked in bold.

Section 3.1), but also at the fact that such emotions are interwoven with others. For instance, in Table 4, shame falls under the same coping strategy as guilt – both are indeed related to self-forgiveness (Leach, 2017); disgust, like anger, is a response to a moral violation (Molho et al., 2017) and part of the so called CAD triad (Contempt, Anger and Disgust) of moral-based emotions according to Rozin et al. (1999) – the three are often elicited in combination in hostile situations (Matsumoto et al., 2016), which might explain why they are all correlated with attack.

Therefore, even if not perfectly aligned with Roseman’s taxonomy, the workers’ understanding of coping appears meaningful, based on both theoretically-established links between emotions and our experimental setup for data collection.

Effect of Role-Playing. To further evaluate the participants’ understanding of coping, we now observe if they disentangled X ’s emotions from their own. We focus on the answers of the 571 respondents (47.5% of the crowdworkers) who claimed that they would not react as X , and we test this self-assessment by performing a Wilcoxon (1945) signed-rank test between the emotion scores provided while role-playing X and the scores provided from their personal perspective (e.g., between the scores of X ’s anger and the participant’s). We find that claiming a different personal reaction corresponds indeed to different emotion reactions: ex-

cept for pride (p-value: .06), all pairs of values for the same emotion are significantly different.⁸ In sum, X 's emotions and the annotators' emotions can be clearly separated. This corroborates that the participants successfully engaged in the make-pretend activity, distinguishing their affective responses from those imagined for the fictional character.

4.2 Coping from the Perspective of Readers

Focusing only on the textual responses gathered with role-playing, we now reverse the direction of inquiry, and question if the texts express the intended coping strategies according to readers.

Inter-Annotator Agreement. We conduct an in-house annotation study to see if said strategies are successfully recognized by external people. We randomly select 100 texts and have 3 annotators decide if and what coping strategy emerges from each of them. Inter-annotator agreement computed with Fleiss' kappa (1971) shows that the annotators' judgments were not consistently similar ($\kappa = .34$). Annotators achieved the highest agreement on the strategy of contact (.60) and the lowest on reject (.04). On 42 texts, they provided unanimous judgments. However, on only 28 of these items were the correct prompting labels recognized (mostly, attack and contact). Surprisingly, a majority vote was reached on only a few more texts (45); that vote matches the correct label for 18 of those. This finding hints at the fact that the intended coping strategies are recognized when they are as clear as to put many people in agreement.

Annotation differences were potentially influenced by the interaction between coping strategies and topics, with certain topics making the expression of the strategies harder for the crowdworkers, and consequently limiting the κ values among the readers. Overall, like emotions, whose recognition can lead to low inter-annotator agreement, the perception of coping in text proves extremely subjective as well. Accordingly, the adoption of psychological theories for the annotation of NLP resources proves a challenging task deserving systematic analysis.

Differences in Linguistic Patterns. To better understand these annotation results, we look for significant forms of variation between texts in COPING pertaining to different coping strategies. For

⁸A comparison between X 's emotions and the respondents' self-assigned emotions is in Appendix D.

Strategy	Tokens
attack	you, wrong, stupid, dare, racist
contact	understand, help, feel, while, however
distance	I, subject, sure, but, opinion
reject	do, not, negative, want, attention

Table 5: The five tokens most strongly associated with each strategy.

each strategy, we split COPING in two parts: the first with all the texts related to the given strategy, and the second with all the remaining texts. We then compare the distribution of tokens in the two sets, by computing the Jensen–Shannon divergence (Menéndez et al., 1997) for each token.

Table 5 lists the five tokens most strongly associated with each strategy. A set of tokens appears highly coherent with attack (e.g., wrong, dare) and contact (e.g., understand, feel). A manual qualitative analysis of the texts corroborates this finding. Contact might be relatively easy to recognize thanks to politeness markers (e.g., “*Allow me to disagree*”), while the detection of attack corresponds to opposite linguistic strategies, such as pressing questions (“*How are they creating chaos by just existing?*”), direct confrontations (“*Only a fool wouldn't not see the obvious*”), and expressions of how strongly X feels about their opinion or the interlocutor's (e.g., “*I could not disagree more*”, “*you are completely wrong*”).

Specific linguistic patterns are less evident for distance and reject, associated with tokens that vaguely express them. The difference with the other two coping strategies might be explained referring to Roseman's theory. Attack and contact require interaction with the emotion stimulus; distance and reject disengage from it. Role-playing disengagement might be more challenging, because it requires participants to react to a stimulus while detaching themselves from it. Ultimately, these observations point out that some coping strategies are easier to be imbued (and recognized) in text, at least when they are purposefully produced.

5 Coping Strategies Classification

(RQ2) Can coping strategies be identified automatically? We answer our second research question using fine-tuned and prompt-based language models for coping strategy detection.

Models. We fine-tune three Small Language Models (SLMs) on the COPING texts: BERT (De-

	Answer	Behavior	Answ.+Behav.
BERT	.401	.395	.457
DistilBERT	.523	.443	.507
RoBERTa	.477	.537	.512
phi2	.356	.391	.322
mistral2	.392	.474	.538
dolphin2	.422	.550	.520
nous-hermes	.387	.526	.515

Table 6: Top: F_1 scores of the SLMs ran on X 's answers (Answer), X 's behavior (Behavior), and a concatenation of both (Answ.+Behav.). Bottom: F_1 scores obtained by feeding the four LLMs (rows) with a concatenation of instructions and input text (Answer, Behavior, both).

vlin et al., 2019), DistilBERT (Sanh et al., 2019), and RoBERTa (Liu et al., 2019). The fine-tuning is performed on three separate sets of texts: X 's answers, X 's behaviors, and their concatenation. After splitting the corpus in a train and a test set (90% and 10% of the data), we fine-tune each model over three random train/validation splits and train it for 10 epochs with a batch size of 10.⁹ As for the prompt-based models, we implement zero-shot classifiers with four open-source LLMs, i.e., phi-2, mistral-2, nous-hermes-2, dolphin-2, reproducing the design used with SLMs (answer, behavior, and their concatenation) on the same test data.¹⁰

Results. The classification of coping strategies turns out challenging, both for the SLMs and the prompt-based models. As shown in Table 6, which reports the best F_1 score obtained by the classifiers on the test set, all results are below .55.

We observe differences for different types of input texts. DistilBERT has the best classification performance when fed with answers ($F_1 = .523$), while RoBERTa performs better in the classification of X 's behaviors, with a score of .537. The combination of replies and reactions does not lead to a better performance: the best model is RoBERTa with an F_1 score of .512, which is lower than the ones obtained for replies and reactions separately. The zero-shot classifiers are on par with the others. Once more, the outputs based on behavior alone surpass the two other setups. Here, the difference between Answer and Behavior is much more noticeable (12 points in F_1 for dolphin-2, ≈ 14 F_1 points for nous-hermes).

Zooming in the results by topic (Table 7), we see

⁹Each training has been performed on a NVIDIA RTX-3060 Ti and lasted 25 minutes on average.

¹⁰Appendix E details models, prompts, and full results.

		Answer	Behavior
Topics	Abortion	.623	.630
	Drugs	.513	.488
	Immigration	.365	.483
	LGBTQ+	.508	.619
	Racism	.570	.457
Labels	Attack	.500	.545
	Contact	.647	.617
	Distance	.539	.560
	Reject	.408	.428

Table 7: Classification results (F_1) broken down by topic and coping strategy. Answers have been classified with DistilBERT, behaviors with RoBERTa.

that both answers (.623 F_1 score) and behaviors (.630) in scenarios related to abortion are better recognized by the fine-tuned DistilBERT (answers) and RoBERTa (behaviors). The lowest F_1 score on X 's answers is obtained with immigration-related scenarios (.365), while the worst classification of X 's behaviors with racism-related scenarios (.457). We also notice that not all coping strategies are equally difficult to detect (cf. Table 7). The easiest is contact, classified with an F_1 score of .647 using X 's answers and .617 using behaviors. Conversely, the classification of reject results in the lowest F_1 scores: .408 for answers and .428 for behaviors. This aligns with the human recognition of coping strategies, with contact and reject defining the best and worst recognized labels using character X 's answers (cf. Section 4.2).

Put together, these numbers suggest that X 's answers provide some coping signal, but the texts about X 's behavior are key to capture the "seeking more of an event" or "seeking less of it", central to the emergence of coping and its link with behavior.

6 Discussion and Conclusion

This paper follows a recent wave of studies (Cortal et al., 2023; Liu and Jaidka, 2023, i.a.) that initiated a dialogue with other disciplines (like psychology), to broaden the tools of computational emotion analysis and push forward its potential to shed light on how emotions work in language. We focused on the entanglement between emotions and coping strategies, never-before explored in NLP. Our goal was to understand if emotion-bearing texts allow to infer affective information that goes beyond discrete emotion experiences as captured by emotion labels, extending to their core motives of "seeking more or less" of a stimulus.

Identifying coping strategies computationally

could indeed benefit emotion analysis in multiple ways, as it can be instrumental for different downstream objectives, for instance to understand argumentative strategies, revealing how people react to verbal conflicts. Leveraging coping strategies is also valuable to establish connections with other theoretical and computational frameworks. One can identify coping strategies in a multi-task setup to better identify the emotions of a text (e.g., based on Ekman’s theory), or explore their link with appraisal theories in event-centered emotion analysis (Klinger, 2023), to explain how events (e.g., those described in our scenarios) are evaluated or re-appraised (cf. Li et al., 2024; Morris et al., 2015). Such integrated approaches promise a comprehensive understanding of emotions that is still ripe for investigation.

As a first contribution in this direction, we built a corpus for coping detection via role-playing. Role-playing enabled us to overcome the lack of available textual data annotated with coping information. Moreover, it facilitated our attempt to communicate abstract constructs to laypeople, and to gain control over many variables (e.g., all people had the goal of realizing a coping strategy, in response to the same controversial statements, on a small set of topics) but at the same time it introduced some artifacts. Notably, the expression and identification of coping strongly relied on our ability to communicate them in X ’s descriptions, as well as people’s ability to understand such descriptions, to engage in role-playing, and to produce good-quality, coping-expressing texts.

Therefore, both the quality of the texts and the classification results are to be discussed while considering the challenges introduced by our data collection procedure: the participants in our study demonstrated a robust understanding of coping within a strict experimental setup – corroborating that data on this psychological concept can be obtained via crowdsourcing; the texts they produced, on the other hand, generally do not exhibit characteristics that allowed our readers or automatic classifiers to perfectly discern the correct coping strategies. It remains to be determined whether this is due to the intentionality of coping expression (despite evidence that the crowdworkers’ acting was successful) or because these strategies are naturally communicated in covert manners, making them hard to discern. Overall, the emergence of coping from text appears less straightforward than

we initially hypothesized, but this conclusion is not definitive, as one could still expect that, were the texts produced for counter-arguing purposes (like ours) but spontaneously (unlike ours), the attack, contact, distance, or reject mechanisms might be clearer. In fact, the possible recognition of coping, and the idea that these strategies lend themselves for annotation is corroborated by our analysis of their link to emotions – with meaningful patterns that find substantial correspondence in Roseman’s literature. This hints at the great potential of coping to be used for future tasks.

Acknowledgements

This work has been supported by the Deutsche Forschungsgesellschaft (DFG, Project KL 2869/1-2, No. 380093645). It also received funding from the Flemish Government under the Research Program Artificial Intelligence (grant no. 174E07824) and under the Research Foundation - Flanders (FWO, grant no. 1S96322N). This work was also partially supported by “HARMONIA” project - M4-C2, I1.3 Partenariati Estesi - Cascade Call - FAIR - CUP C63C22000770006 - PE PE0000013 under the NextGenerationEU programme. We further thank Kai Sassenberg for his valuable input and Amit Goldenberg his insightful pointers concerning negativity reframing and re-appraisal.

Ethical Statement

The role-playing study has been approved by an ethical committee collaborating with our affiliations. Crowdworkers were rewarded with a fee that corresponds to 9€ *per* hour for their participation.

Since the texts in COPING are based on conflictual dialogues, they contain potentially sensitive material that might depict real-life experiences of some individuals. All crowdworkers were warned beforehand, and were informed about the type of debate they would have entered by taking part in the study. Their IDs in the corpus have been encrypted to prevent identification.

Both the fictional interlocutor (whose utterances were produced by ChatGPT) and X (impersonated by people) express standpoints that can have political significance. We remain neutral with respect to both sides.

Limitations

While we deemed COPING appropriate to conduct a proof-of-concept study, we acknowledge that its

size is suboptimal to extrapolate features of coping strategies, and train classification models.

Its construction relied on several preliminary rounds of crowdsourcing which corroborated the difficulty of our tasks for laypeople. We simplified it via role-playing, but this strategy required us to embrace some simplifying assumptions. First and foremost, texts were not generated while experiencing the emotion(s) necessary to implement a coping strategy. The conflictual situations depicted in the scenarios had the potential to stir an emotion, but we did not measure their success in this sense, and we recognize that imagining to feel an emotion is not the same (in terms of cognitive and physiological processes) as actually feeling one.

To mitigate this problem, we assigned participants to the topics they might feel more related to by opening the studies to crowdworkers with specific demographics (e.g., women for the abortion topic). This decision was also based on simplifying assumptions, namely, that demographics approximate one's experiences and involvement in the given topic, and that the understanding of laypeople would reflect in their ability to generate texts.

Overall, our setup does not necessarily correspond to one that psychological research on coping would adopt: albeit useful, coping strategies still require us to reflect on how to more seamlessly connect emotion-based NLP and the disciplines from which we borrow theoretical constructs.

References

- Hassan Alhuzali and Sophia Ananiadou. 2021. [SpanEmo: Casting multi-label emotion classification as span-prediction](#). In *Proceedings of the 16th Conference of the European Chapter of the Association for Computational Linguistics: Main Volume*, pages 1573–1584, Online. Association for Computational Linguistics.
- Cristina Battaglini, Rossana Damiano, and Vincenzo Lombardo. 2014. [Moral values in narrative characters: an experiment in the generation of moral emotions](#). In *Interactive Storytelling: 7th International Conference on Interactive Digital Storytelling, ICIDS 2014, Singapore, Singapore, November 3-6, 2014, Proceedings 7*, pages 212–215. Springer.
- Allan Baumer and Brian Magerko. 2009. [Narrative development in improvisational theatre](#). In *Interactive Storytelling: Second Joint International Conference on Interactive Digital Storytelling, ICIDS 2009, Guimarães, Portugal, December 9-11, 2009, Proceedings 2*, pages 140–151. Springer.
- Laura-Ana-Maria Bostan and Roman Klinger. 2018. [An analysis of annotated corpora for emotion classification in text](#). In *Proceedings of the 27th International Conference on Computational Linguistics*, pages 2104–2119, Santa Fe, New Mexico, USA. Association for Computational Linguistics.
- Sven Buechel and Udo Hahn. 2018. [Word emotion induction for multiple languages as a deep multi-task learning problem](#). In *Proceedings of the 2018 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Volume 1 (Long Papers)*, pages 1907–1918, New Orleans, Louisiana. Association for Computational Linguistics.
- Shinwoo Choi, Joo Young Hong, Yong Je Kim, and Hye-joon Park. 2020. [Predicting psychological distress amid the covid-19 pandemic by machine learning: Discrimination and coping mechanisms of korean immigrants in the u.s.](#) *International Journal of Environmental Research and Public Health*, 17(17).
- Gustave Cortal, Alain Finkel, Patrick Paroubek, and Lina Ye. 2023. [Emotion recognition based on psychological components in guided narratives for emotion regulation](#). In *Proceedings of the 7th Joint SIGHUM Workshop on Computational Linguistics for Cultural Heritage, Social Sciences, Humanities and Literature*, pages 72–81, Dubrovnik, Croatia. Association for Computational Linguistics.
- Harald Cramér. 1999. *Mathematical methods of statistics*, volume 26. Princeton University Press.
- Dorottya Demszky, Dana Movshovitz-Attias, Jeongwoo Ko, Alan Cowen, Gaurav Nemade, and Sujith Ravi. 2020. [GoEmotions: A dataset of fine-grained emotions](#). In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics*, pages 4040–4054, Online. Association for Computational Linguistics.
- Jacob Devlin, Ming-Wei Chang, Kenton Lee, and Kristina Toutanova. 2019. [BERT: Pre-training of deep bidirectional transformers for language understanding](#). In *Proceedings of the 2019 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Volume 1 (Long and Short Papers)*, pages 4171–4186, Minneapolis, Minnesota. Association for Computational Linguistics.
- Paul Ekman. 1992. [An argument for basic emotions](#). *Cognition & emotion*, 6(3-4):169–200.
- Joseph L. Fleiss. 1971. Measuring nominal scale agreement among many raters. *Psychological bulletin*, 76(5):378.
- Jun Gao, Yuhan Liu, Haolin Deng, Wei Wang, Yu Cao, Jiachen Du, and Ruifeng Xu. 2021. [Improving empathetic response generation by recognizing emotion cause in conversations](#). In *Findings of the Association for Computational Linguistics: EMNLP 2021*,

- pages 807–819, Punta Cana, Dominican Republic. Association for Computational Linguistics.
- Alessandro Giovannelli. 2009. [In sympathy with narrative characters](#). *The Journal of Aesthetics and Art Criticism*, 67(1):83–95.
- Samuel D. Gosling, Peter J. Rentfrow, and William B. Swann. 2003. [A very brief measure of the big-five personality domains](#). *Journal of Research in Personality*, 37(6):504–528.
- Will E. Hipson and Saif M. Mohammad. 2021. [Emotion dynamics in movie dialogues](#). *PLOS ONE*, 16(9):1–19.
- Robert L. Kahn, Donald M. Wolfe, Robert P. Quinn, J. Diedrick Snoek, and Robert A. Rosenthal. 1964. *Organizational Stress: Studies in Role Conflict and Ambiguity*. New York: John Wiley.
- Roman Klinger. 2023. [Where are we in event-centric emotion analysis? bridging emotion role labeling and appraisal-based approaches](#). In *Proceedings of the Big Picture Workshop: Crafting a Research Narrative*, Singapore. EMNLP, Association for Computational Linguistics.
- Richard S. Lazarus. 1991a. *Emotion and adaptation*. Oxford University Press.
- Richard S. Lazarus. 1991b. [Progress on a cognitive-motivational-relational theory of emotion](#). *American psychologist*, 46(8):819–34.
- Richard S. Lazarus and Susan Folkman. 1984. *Stress, appraisal, and coping*. Springer.
- Colin Wayne Leach. 2017. [Understanding shame and guilt](#). *Handbook of the psychology of self-forgiveness*, pages 17–28.
- Joanna Z. Li, Alina Herderich, and Amit Goldenberg. 2024. [Skill but not effort drive gpt overperformance over humans in cognitive reframing of negative scenarios](#). *PsyArXiv*.
- Xuan Liu and Kokil Jaidka. 2023. [I am PsyAM: Modeling happiness with cognitive appraisal dimensions](#). In *Findings of the Association for Computational Linguistics: ACL 2023*, pages 1192–1210, Toronto, Canada. Association for Computational Linguistics.
- Yinhan Liu, Myle Ott, Naman Goyal, Jingfei Du, Mandar Joshi, Danqi Chen, Omer Levy, Mike Lewis, Luke Zettlemoyer, and Veselin Stoyanov. 2019. [Roberta: A robustly optimized bert pretraining approach](#). *arXiv preprint arXiv:1907.11692*.
- Stacy C Marsella and Jonathan Gratch. 2009. [Ema: A process model of appraisal dynamics](#). *Cognitive Systems Research*, 10(1):70–90.
- David Matsumoto, Hyisung C. Hwang, and Mark G. Frank. 2016. [The effects of incidental anger, contempt, and disgust on hostile language and implicit behaviors](#). *Journal of Applied Social Psychology*, 46(8):437–452.
- María L. Menéndez, Julio A. Pardo, Leandro Pardo, and María del Carmen Pardo. 1997. [The Jensen-Shannon divergence](#). *Journal of the Franklin Institute*, 334(2):307–318.
- Saif Mohammad. 2018. [Obtaining reliable human ratings of valence, arousal, and dominance for 20,000 English words](#). In *Proceedings of the 56th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pages 174–184, Melbourne, Australia. Association for Computational Linguistics.
- Catherine Molho, Joshua M Tybur, Ezgi Güler, Daniel Balliet, and Wilhelm Hofmann. 2017. [Disgust and anger relate to different aggressive responses to moral violations](#). *Psychological science*, 28(5):609–619.
- Robert R. Morris, Stephen M. Schueller, and Rosalind W. Picard. 2015. [Efficacy of a web-based, crowdsourced peer-to-peer cognitive reappraisal platform for depression: Randomized controlled trial](#). *Journal of Medical Internet Research*, 17(3):e72.
- Sungjoon Park, Jiseon Kim, Seonghyeon Ye, Jaeyeol Jeon, Hee Young Park, and Alice Oh. 2021. [Dimensional emotion detection from categorical emotion](#). In *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing*, pages 4367–4380, Online and Punta Cana, Dominican Republic. Association for Computational Linguistics.
- Robert Plutchik. 2001. [The nature of emotions: Human emotions have deep evolutionary roots, a fact that may explain their complexity and provide tools for clinical practice](#). *American Scientist*, 89(4):344–350.
- Ira J. Roseman. 2013. [Appraisal in the emotion system: Coherence in strategies for coping](#). *Emotion Review*, 5(2):141–149.
- Paul Rozin, Laura Lowery, Sumio Imada, and Jonathan Haidt. 1999. [The CAD triad hypothesis: a mapping between three moral emotions \(contempt, anger, disgust\) and three moral codes \(community, autonomy, divinity\)](#). *Journal of personality and social psychology*, 76(4):574.
- James A. Russell. 2012. [From a psychological constructionist perspective](#). In *Categorical versus dimensional models of affect: A seminar on the theories of Panksepp and Russell*, volume 7, pages 79–118. John Benjamins Amsterdam, the Netherlands.
- Koustuv Saha, Sang Chan Kim, Manikanta D. Reddy, Albert J. Carter, Eva Sharma, Oliver L. Haimson, and Munmun De Choudhury. 2019. [The language of LGBTQ+ minority stress experiences on social media](#). *Proceedings of the ACM on human-computer interaction*, 3(CSCW):1–22.
- Victor Sanh, Lysandre Debut, Julien Chaumond, and Thomas Wolf. 2019. [DistilBERT, a distilled version of BERT: smaller, faster, cheaper and lighter](#). In *NeurIPS EMC² Workshop*.

- Klaus R. Scherer. 1982. [Emotion as a process: Function, origin and regulation](#). *Social Science Information*, 21(4-5):555–570.
- Klaus R. Scherer, Angela Schorr, and Tom Johnstone. 2001. [Appraisal Processes in Emotion: Theory, Methods, Research](#). Oxford University Press.
- Thomas Schmidt, Katrin Dennerlein, and Christian Wolff. 2021. [Emotion classification in German plays with transformer-based language models pretrained on historical and contemporary language](#). In *Proceedings of the 5th Joint SIGHUM Workshop on Computational Linguistics for Cultural Heritage, Social Sciences, Humanities and Literature*, pages 67–79, Punta Cana, Dominican Republic (online). Association for Computational Linguistics.
- Ellen A. Skinner, Kathleen Edge, Jeffrey Altman, and Hayley Sherwood. 2003. [Searching for the structure of coping: A review and critique of category systems for classifying ways of coping](#). *Psychological Bulletin*, 129(2):216–269.
- Craig A. Smith and Leslie D. Kirby. 2009. [Putting appraisal in context: Toward a relational model of appraisal and emotion](#). *Cognition and Emotion*, 23(7):1352–1372.
- Marloes L.C. Spekman, Elly A. Konijn, and Johan F. Hoorn. 2018. [Perceptions of healthcare robots as a function of emotion-based coping: The importance of coping appraisals and coping strategies](#). *Computers in human behavior*, 85:308–318.
- Andero Uusberg, Jamie L. Taxer, Jennifer Yih, Helen Uusberg, and James J. Gross. 2019. [Reappraising reappraisal](#). *Emotion Review*, 11(4):267–282.
- Lanrui Wang, Jiangnan Li, Zheng Lin, Fandong Meng, Chenxu Yang, Weiping Wang, and Jie Zhou. 2022. [Empathetic dialogue generation via sensitive emotion recognition and sensible knowledge selection](#). In *Findings of the Association for Computational Linguistics: EMNLP 2022*, pages 4634–4645, Abu Dhabi, United Arab Emirates. Association for Computational Linguistics.
- Frank Wilcoxon. 1945. [Individual comparisons by ranking methods](#). *Biometrics Bulletin*, 1(6):80–83.
- Gerard Yeo and Kokil Jaidka. 2023. [The PEACE-reviews dataset: Modeling cognitive appraisals in emotion text analysis](#). In *Findings of the Association for Computational Linguistics: EMNLP 2023*, pages 2822–2840, Singapore. Association for Computational Linguistics.
- Hongli Zhan, Desmond Ong, and Junyi Jessy Li. 2023. [Evaluating subjective cognitive appraisals of emotions from large language models](#). In *Findings of the Association for Computational Linguistics: EMNLP 2023*, pages 14418–14446, Singapore. Association for Computational Linguistics.
- Caleb Ziems, Minzhi Li, Anthony Zhang, and Diyi Yang. 2022. [Inducing positive perspectives with text reframing](#). In *Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pages 3682–3700, Dublin, Ireland. Association for Computational Linguistics.

A Describing Coping Strategies

The formulation of coping strategies described in Section 3.1 was based on 4 crowdsourcing rounds. Round 1, 3, and 4 involved 100 participants each (25 per coping strategy). In round 2, we only focused on attack and reject, with the goal to maximize their difference (25 people participated for each of these strategies). We selected participants on the basis of first and primary language (i.e., English), approval rate on past Prolific studies (between 90% and 100%). Participants could only take our study once (i.e., for no more than one coping strategy, in no more than one round). The total cost of this phase was 210£.

Each round comprised 4 questionnaires, one per coping strategy. All questionnaires included the same questions, one for the identification of coping strategies and two others, to (1) rate how much of a given list of emotions are likely felt by character X , when confronted with an unpleasant situation, and (2) associate (the Big-Five) personality traits to X . The emotion list included those analyzed by Roseman (2013): anger, contempt, disgust, dislike, distress, fear, frustration, guilt, hope, joy, love, pride, regret, relief, sadness, shame. Each of them was rated on a 4-item scale (i.e., from *The emotion does not apply* to *The emotion very much applies*). We additionally collected personality traits because the coping understanding task presents coping strategies in terms of personalities.

Emotion information served to observe if the annotators' associations of emotions to coping strategies mapped to the original taxonomy proposed by Roseman, in which each strategy underlies a handful of emotions (similar to what we did in the role-playing data, in Section 4.1). Instead, information about the traits of X served to analyze if X 's descriptions led people to form similar understandings of its persona, in terms of openness to experience, conscientiousness, extroversion, agreeableness and emotional stability.

We detail tasks and corresponding results below.

A.1 Annotating Coping Descriptions

The description of character X in a coping-specific questionnaire changed from round to round. Figure 3 reports the confusion matrices for the successive rounds of this crowdsourcing step, indicating the number of annotators who correctly associated X description to the corresponding coping strategy (diagonal cells) and how many made incorrect

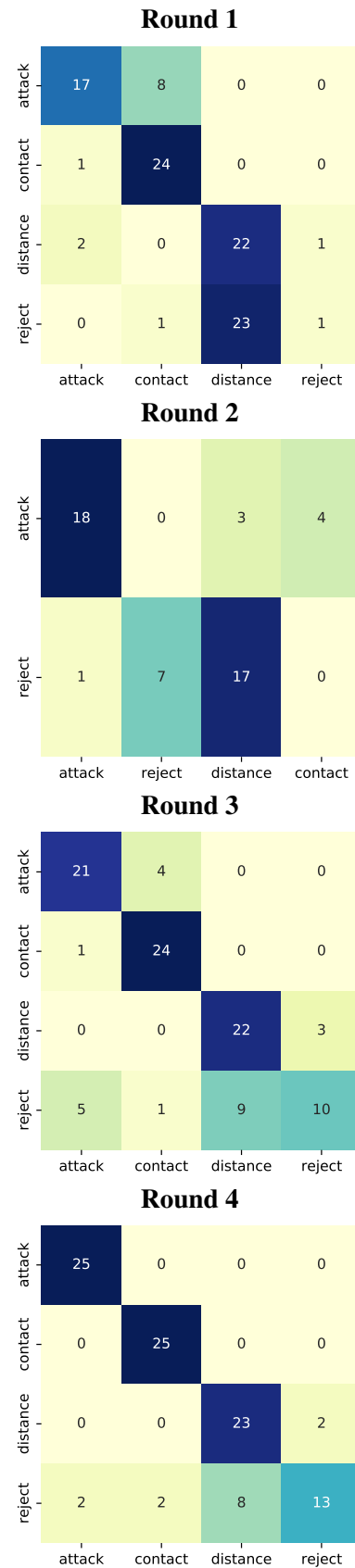


Figure 3: Confusion matrices for the pre-test rounds. Rows are the annotated labels. Columns are original labels. Numbers correspond to the annotators (in total, 25 for each strategy).

associations (off-diagonal numbers).

The descriptions entering the role-playing guidelines are those found in the last round (see Table 8). Thanks to such descriptions, the annotators reached perfect understanding of attack and contact, 92% of the annotators correctly chose the distance strategy, and 52% made the correct inference for reject.

A.2 Additional Tasks

Besides associating character's X description to a one-liner summary of the corresponding coping strategy, the annotators judged emotions and personality traits.

Emotions. In order to better assess the performance the annotators, we investigated how similar the emotion understandings of wrong and correct annotators are. More precisely, we observe:

1. if the annotators rated the emotions similarly, despite their coping choices being different (if so, we can move on to the generation phase);
2. to what extent they captured the "correct" emotions (i.e., those assigned by Roseman to each coping strategy) – once more, this would be a sign that we can proceed with role-playing phase of crowdsourcing.

The answer to point 1. emerges from Figure 4, Table 9 and Table 10, which contain results from the last round.

Figure 4 shows the average values assigned to each emotion, for each coping strategy. The values obtained from the annotators who correctly understood the coping strategy are side-by-side the values computed on the answers of the annotators who did not get the correct strategy.

While the figure tells us "how much" the annotators rated an emotion, Table 9 and 10 summarize this information in a binary way (did the annotators assign a given emotion to a coping strategy?). The symbol ✓ means that a given emotion was recognized. Note that emotions were rated on a scale from 1 to 5. To decide if an emotion counts as correctly recognized, we observe if it has an average rating of >2 . The numbers next to ✓ correspond to the ranking of the emotion (e.g., 1 means that the emotion for that coping strategy had the highest average rating).

From both Figure 4 and the tables, we see that the emotions captured by the two groups of annotators overlap for all coping strategies.

Concerning point 2., we answer it by looking at Table 9 and Table 10. Both report the annotators' judgments next to the correct emotions indicated by Roseman. There, we see that for none of the coping strategies the annotators understood all relevant emotions. However, the correct emotions that the crowdworkers captured have the highest ranks (e.g., focusing on attack, anger and frustration have the highest ratings, for both groups of annotators).

Personality Traits. Crowdworkers estimated how much the 10 items in the questionnaire of Gosling et al. (2003) might apply to character X . The questionnaire evaluated openness to experience by contrasting "open to new experiences and complex" against "conventional and uncreative"; conscientiousness through the trait "dependable and self-disciplined" versus "disorganized and careless"; extraversion by comparing "extraverted and enthusiastic" with "reserved and quiet"; agreeableness by distinguishing between "sympathetic and warm" and "critical and quarrelsome"; and emotional stability by assessing "calm and emotionally stable" against "anxious and easily upset". Respondents rated X on these dichotomous descriptors using a 7-point Likert scale ranging from "disagree strongly" to "agree strongly".





Strategy: Attack	
<p>Description: X is a very opinionated person, who comes across as aggressive and combative. When problems or unpleasant situations arise, X responds with a hardened resolve. X gives their all to overcome obstacles, and never shies away from a conflict. In fact, this character faces negative situations fiercely and with intense energy, taking action personally in order to right the wrong. For this reason, one can often see X all tense and pumped up.</p> <p>Short summary: X rights the wrong in an aggressive manner, like in the picture below (X is shown in blue).</p>	
Strategy: Contact	
<p>Description: This character comes across as a calm, understanding, and very approachable person. For X, communication serves to unite people. It is an opportunity to exchange opinions, acknowledging the diversity of perspectives among individuals. When problems or unpleasant situations arise, this character responds with a constructive attitude. X expresses ideas with confidence, trying to solve problems in a respectful manner. X can effectively engage in discussions also with people having contrasting opinions.</p> <p>Short summary: X rights the wrong with an open mindset, like in the picture below (X is shown in blue).</p>	
Strategy: Distance	
<p>Description: In life, X has managed to create a peaceful mental space as a protection from the outside world. This character always seeks emotional tranquillity, and finds solace in self-reflection. When problems or unpleasant situations arise, X feels powerless, not too capable to change the external world. So here's X's defense strategy against all negativity: staying away from stressful things, events, people or thoughts, to minimize their influence. At the cost of coming across as an avoidant person, X does not engage in conflicts and uncomfortable situations.</p> <p>Short summary: X seeks shelter from unpleasant situations in a quiet inner space, like in the picture below (X is shown in blue).</p>	
Strategy: Reject	
<p>Description: This person has a judgmental attitude towards others. X easily disagrees with people, and is often displeased with their behaviors and beliefs. Here's X's motto in life: do not let anybody interfere with your well-being. This character keeps negativity away at all costs. It's not that X hides from problems and tries to find solace in a peaceful mental space, it's more of a resolute attempt to refuse unpleasant situations. It's also not a lack of courage; in fact, X expresses opinions with confidence, and precisely by this, X manages to dismiss conflicts with other people.</p> <p>Short summary: X's approach to life is a firm refusal of negativity, like in the picture below (X is shown in blue).</p>	

Table 8: Descriptions of *X* used in the final round of coping recognition and in the role-playing crowdsourcing phase. Each copying strategy is presented as a description of character *X*, and in a more concise version (short summary), and with the reported picture.

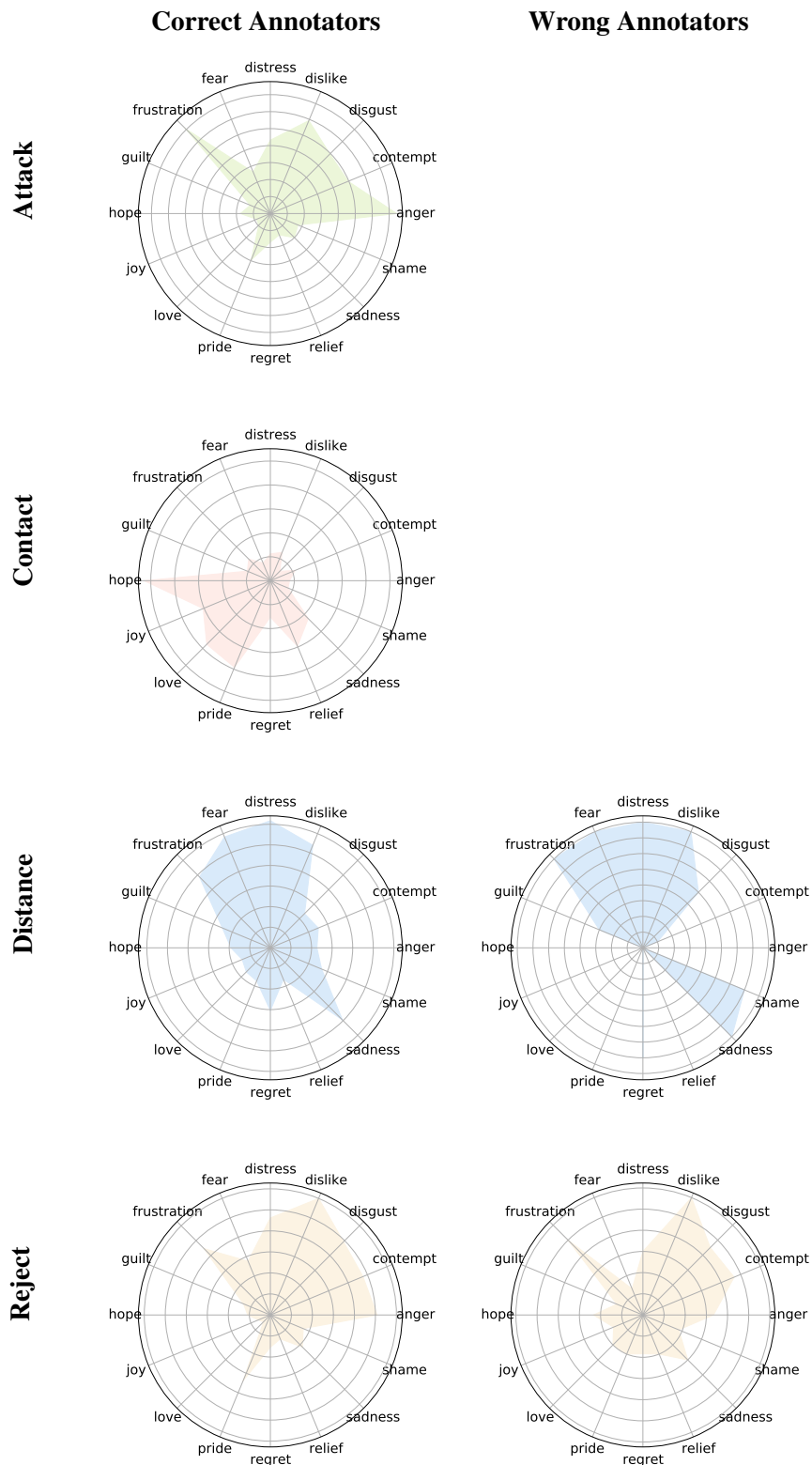


Figure 4: Plots of the emotion answers (averages) for the last crowdsourcing round of coping strategy recognition, divided by annotators who were right about the coping strategy (Correct Annotators) and those who did not correctly recover the strategy from the description (Wrong Annotators). For *attack* and *contact*, all crowdworkers were correct.

Emotions	Attack		Contact	
	Original	Correct Annotat.	Original	Correct Annotat.
Anger	✓	✓, 1		
Contempt		✓, 5		
Disgust		✓, 4		
Dislike		✓, 3		
Distress		✓, 6		
Fear				
Frustration	✓	✓, 2		
Guilt	✓			
Hope			✓	✓, 1
Joy			✓	
Love			✓	
Pride			✓	
Regret			✓	
Relief			✓	
Sadness				
Shame				
Surprise				

Table 9: Emotions for the strategy Attack and Contact as indicated by Roseman (2013) (column Original) and understood by our annotators in the last round of the coping annotation phase of crowdsourcing. All annotators in this round identified the correct coping strategy (Correct Annotators). ✓ means that an emotion average rating was > 2. Numbers are rankings of emotion averages.

Emotions	Distance			Reject		
	Original	Correct Annotat.	Wrong Annotat.	Original	Correct Annotat.	Wrong Annotat.
Anger					✓, 2	
Contempt				✓	✓, 4	✓, 3
Disgust				✓	✓, 3	✓, 4
Dislike	✓	✓, 3	✓, 1		✓, 1	✓, 1
Distress	✓	✓, 1	✓, 2		✓, 5	
Fear	✓	✓, 2	✓, 3			
Frustration		✓, 5	✓, 4		✓, 6	✓, 2
Guilt						
Hope						
Joy						
Love						
Pride						
Regret	✓		✓, 6			
Relief						
Sadness	✓	✓, 4	✓, 5			
Shame			✓, 7	✓		
Surprise						

Table 10: Emotions for the strategy Distance and Reject as indicated by Roseman (2013) (column Original) and understood by our annotators in the last round of the coping annotation phase of crowdsourcing. Annotators are divided into those who identified the correct coping strategy (column Correct Annot.) and those who failed the task (column Wrong Annot.). ✓ means that an emotion average rating was > 2. Numbers are rankings of emotion averages.

B Generating Scenarios

We identified the topics via ChatGPT-4, asked to list 20 sensitive topics for specific categories of people. This step was independently performed by three researchers, who later integrated and refined their outputs in a set of 5 topics: abortion, immigration, racism, LGBTQ+, drugs.

For the scenario generation, ChatGPT-4 had to refrain from characterizing the gender of the interlocutors (hence, the names X and Y). Scenarios were produced between August 14 and October 31 (2023) with ChatGPT-4.

Table 11 shows how we prompted ChatGPT-4 (we show it for only one topic and one scenario for brevity) and Table 12 reports all scenarios we used in our study.

Table 11: ChatGPT-4 generation of scenarios. Green rows correspond to humans, white rows to the assistant's replies. For simplicity, we only report one generated scenario.

I am conducting a study about Roseman's coping strategies (i.e., attack, contact, distance and reject). My goal is to study how each strategy realises in language when speakers discuss about controversial topics. Imagine that during an interaction, one of the interlocutors expresses an opinion that makes another uncomfortable; the latter thus responds with a verbal utterance and a non-verbal reaction while being "under the influence" of a coping strategy.

Certainly! Studying how Roseman's coping strategies manifest in language, especially during discussions on controversial topics, is an intriguing area of inquiry. When individuals discuss controversial topics and face conflicting or uncomfortable opinions, they might adopt one or more of Roseman's coping strategies in their verbal and non-verbal behavior.

Here's a breakdown of each strategy along with potential verbal and non-verbal manifestations:

1. Attack:

Verbal: An individual might use aggressive language, accusations, or challenges. They might say things like, "That's completely wrong," "How can you even believe that?", or "You clearly haven't done your research."

Non-Verbal: Physically leaning forward, intense eye contact, clenched fists, raised voice, or even pointing fingers. The individual's face might show signs of anger or frustration.

2. Contact:

Verbal: The individual would seek clarification, ask questions, or try to understand the other's viewpoint. They might say, "Can you explain why you feel that way?", "I'm curious to know more about your perspective," or "Let's find some common ground."

Non-Verbal: Leaning in, maintaining steady but non-threatening eye contact, nodding to indicate active listening, and open body posture. The face might reflect genuine curiosity or concern.

3. DISTANCE:

Verbal: An individual might divert the topic, use vague language, or minimize their involvement in the conversation. They might say, "Let's discuss this later," "I need some time to think about it," or simply change the topic altogether.

Non-Verbal: Looking away, physically leaning back, creating physical distance, crossing arms as a defensive posture, or checking one's phone/watch. The face might show signs of discomfort or avoidance.

4. Reject:

Verbal: The individual might dismiss the topic or the person's opinion outright, often without offering a counter-argument. They might say, "That's not even worth discussing," "I can't entertain that thought," or "We'll never agree on this, so let's drop it."

Non-Verbal: Eye-rolling, shaking the head, waving one's hand dismissively, or even walking away. The face might display contempt, disdain, or indifference.

For a comprehensive study, you may also want to consider the tone of voice, the specific linguistic constructions used, the rhythm and pace of speech, and other nuanced non-verbal cues like pupil dilation or micro-expressions. Moreover, always remember that cultural and individual variations can affect how these coping strategies manifest. It would be beneficial to take these variations into account when analyzing and interpreting your findings.

With my next prompts, I'm going to ask you to conduct the following task.

Task Depict three scenarios (each set in a different social context, briefly described) in which two characters, X and Y, interact. Y produces a controversial statement about a given topic that I will specify. That opinion could elicit an emotional reaction in X. Each scenario must be structured like so:

- SCENARIO AND CONTROVERSIAL OPINION
- VERBALIZED REACTION AND NON VERBALIZED REACTION ASSUMING THAT PERSON B ADOPTS THE COPING STRATEGY OF ATTACK
- VERBALIZED REACTION AND NON VERBALIZED REACTION ASSUMING THAT PERSON B ADOPTS THE COPING STRATEGY OF CONTACT
- VERBALIZED REACTION AND NON VERBALIZED REACTION ASSUMING THAT PERSON B ADOPTS THE COPING STRATEGY OF DISTANCE
- VERBALIZED REACTION AND NON VERBALIZED REACTION ASSUMING THAT PERSON B ADOPTS THE COPING STRATEGY OF REJECT

Requirements:

- SCENARIO AND CONTROVERSIAL OPINIONS should span maximum 6 sentences;
- for each scenario, the controversial statement must focus on a different aspect of the issue;
- X must have a verbalized and non-verbalized reaction corresponding to one coping strategy;
- each scenario should feature a different power relationship between X and Y, with them being peers in the first scenario (none holds more power than the other), X being the dominant individual in the second, and Y being the dominant individual in the third;
- when describing the scenario, do not mention the demographics of the interlocutors, but specify their role to one another (e.g., who is Y to X?) as to make the reader understand their relationship.

I will later input the topics and you will generate the scenarios. For now, just confirm if the task is clear.

The task is clear. Once you provide the topics for the controversial statements, I will generate scenarios based on the structure and requirements you've outlined. Just to recap:

1. We'll have three scenarios set in distinct social contexts.
 2. The nature of the relationship between X and Y will differ in each scenario: peers in the first, X dominant in the second, and Y dominant in the third.
 3. Y will make a controversial statement in each scenario.
 4. X's reaction will be provided for each of the four coping strategies, both verbally and non-verbally.
 5. The demographic details of the interlocutors won't be specified, but their roles/relationship will be.
- Please provide the topics for the controversial statements, and I'll proceed with creating the scenarios.

Please generate three different scenarios for the topic immigration policy and border control (at least one of them should focus on islamophobia).

SCENARIO 1: Colleagues at a Company Coffee Break

SCENARIO AND CONTROVERSIAL OPINION X and Y are colleagues who work in the same department and have known each other for a year. During a coffee break, they discuss current events. Y, stirring their coffee, remarks, "Honestly, I think our country's immigration policy is too lenient. We're just letting anyone in, and it's bound to create chaos."

- **ATTACK**

Verbalised Reaction "That's such a narrow-minded view, Y! It's people like you who perpetuate unnecessary fear."

Non-Verbalised Reaction X's eyes narrow, lips tighten, leans forward aggressively, fists clenching the edge of the table.

- **CONTACT**

Verbalised Reaction "Why do you feel that way, Y? Do you think a stricter policy would really solve the perceived problems?"

Non-Verbalised Reaction X tilts head slightly, maintains steady eye contact, eyebrows raised in a questioning manner.

- **DISTANCE**

Verbalised Reaction "Hmm, interesting perspective. Have you tried the new blend of coffee they have here?"

Non-Verbalised Reaction X takes a long sip from their mug, looks away briefly, and shifts weight from one foot to the other.

- **REJECT**

Verbalised Reaction "I don't think this is the place or time to discuss such matters. Let's get back to work."

Non-Verbalised Reaction X sighs, rolls eyes discreetly, and starts gathering their things.

Immigration	
X-Y Relationship Scenario 1	X and Y are colleagues who work in the same department and have known each other for a year. During a coffee break, they discuss current events. Y, stirring its coffee, remarks, “Honestly, I think our country’s immigration policy is too lenient. We’re just letting anyone in, and it’s bound to create chaos.”
X-Y Relationship Scenario 2	Y is a student who stays back after class to discuss an assignment with X, the teacher. During their conversation, Y says, “It’s obvious that the recent surge in Muslim immigrants is just a strategy for them to dominate our culture.”
X-Y Relationship Scenario 3	X is an applicant for a managerial role, while Y is the CEO of the company conducting the interview. As they discuss potential challenges, Y mentions, “We’ve had issues with foreign workers not blending in. Honestly, open borders are more of a problem than a solution.”
Racism	
X-Y Relationship Scenario 1	X is a classmate to Y During a university class discussion on historical racial events, B confidently states, “People keep talking about systemic racism, but I believe that’s just an excuse for those who don’t want to work hard. If you look around, everyone has the same opportunities today.”
X-Y Relationship Scenario 2	X is an instructor, and Y is a regular attendee of a fitness class. During a water break, Y comments to a friend, but loud enough for X to hear, “I still can’t believe they hired a Latino as our instructor.”
X-Y Relationship Scenario 3	X and Y are siblings, having dinner at their parents’ home. As they discuss friends and relationships, Y says, “You know I’ve always believed people should stick to their own kind. It’s just easier.”
Drugs	
X-Y Relationship Scenario 1	X is a concerned parent, and Y is a local politician. During a town hall meeting, Y proposes, “Legalizing all drugs would cut down on crime and help manage addiction better through official channels.”
X-Y Relationship Scenario 2	X is a podcast host, and Y is an expert in public health. During the recording of a podcast discussion, Y mentions, “The ‘War on Drugs’ has largely been ineffective. A harm reduction approach is more viable.”
X-Y Relationship Scenario 3	X and Y are friends. X and Y are friends catching up over coffee. As the topic shifts, Y shares, “I’ve been reading about how some countries are decriminalizing drugs, and it seems like a good move. It focuses on treating users instead of punishing them.”
Abortion	
X-Y Relationship Scenario 1	X and Y are both volunteers at a local food drive. While sorting through donations, Y mentions, “Honestly, limiting access to abortion is just another way of controlling women. Everyone should have a say about their own bodies.”
X-Y Relationship Scenario 2:	X is an attendee at a charity gala, and Y is the guest speaker. In Y’s speech about women’s health, they assert, “It’s time to prioritize the rights of women by ensuring unrestricted access to abortion services.”
X-Y Relationship Scenario 3	At a charity gala dinner, X is a guest, and Y is the keynote speaker. During the speech, Y mentions, “In a world where we’re fighting for so many rights, I wish more emphasis was placed on the rights of the unborn.”
LGBTQ+	
X-Y Relationship Scenario 1	X and Y are siblings, sitting together at a large family gathering. While discussing recent events, Y comments, “I don’t get this whole LGBTQ+ thing. There are just two genders. Why complicate things?”
X-Y Relationship Scenario 2	X is a department manager, and Y is a colleague from a different department. While having coffee, Y says, “These workplace LGBTQ+ training sessions are so unnecessary. Why can’t people just keep their personal lives out of work?”
X-Y Relationship Scenario 3	X is the class president, and Y is an old classmate. During the reunion, Y whispers to X, “Have you noticed? There are so many gay couples here now. It wasn’t like this during our school days.”

Table 12: Scenarios used in the role-playing phase of data creation, divided by topic.

C Role-Playing

While we assume that the participants can simulate coping strategies and propagate them in text, doing that with laypeople in an artificial setup is challenging. We therefore conducted the task in different rounds, to experiment with different implementations of the role-playing task. In the first round, we assigned participants to one X to impersonate. Observing that this setup complicated the role-playing performance, in the following rounds we assigned participants to the X that they mapped to the right s in t : we showed them the 4 X 's descriptions and allowed them to proceed with the subsequent questions based on the X that they label correctly.

Concerning the participants, we opened the study to crowdworkers with a Prolific approval rate between 90% and 100%. We detail the requirements for participation in Table 13, divided by topic (the cross symbol in the table means we did not use a given filter). At each round, we excluded participants from previous rounds. For most studies, we selected participants with English as their first language, and coming from the following countries: UK, US, Canada, Ireland, New Zealand, Australia. The asterisk means we use only a subset.

We reject participants who did not write in first person, did not use direct speech, who produced ungrammatical or too short text, did not disagree with Y , or used too little time to answer (less than 3 minutes).

Topic	Allowed Participants
Immigration†	Immigrated to the country where currently living. Place where spent most time before turning 18: Poland, Germany, India, Pakistan, Ireland, Romania, Mexico, China, Philippines, Dominican Republic, Cuba (i.e., the countries where majority of immigrants in UK and US come from).
Racism	Black, Asian, Mixed, Other
Drugs	Have taken part in alcohol therapy
Abortion	Women, Pro choice and Pro life
LGBTQ+	$65 \leq$ homosexual, bisexual, asexual, other (non heterosexual)
Healthcare	Have a chronic disease
Ageism	$65 \leq$ Age \leq 100

Table 13: Filters used in Prolific to allow participants in our studies. * means we use only a subset of the basic set of residence countries (UK, US, Ireland, New Zealand, Australia), and † means we did not use English as first language.

D Corpus Analysis

Table 14 reports the 10 words with the highest tf-idf across coping strategies. Figure 5 reports an example comparison between the emotions assigned to character *X* and the same emotion for respondents who claimed their own reaction to *Y* would be different from *X*'s.

Attack	think, drugs, rights, people, don, women, right, abortion, disagree, say
Contact	people, think, drugs, believe, different, say, agree, way, good, don
Distance	think, people, drugs, don, say, want, disagree, agree, rights, life
Reject	don, think, people, drugs, rights, want, say, need, believe, unborn

Table 14: Most common words per coping strategy, using tf-idf (to be redone, this was not found on all data).

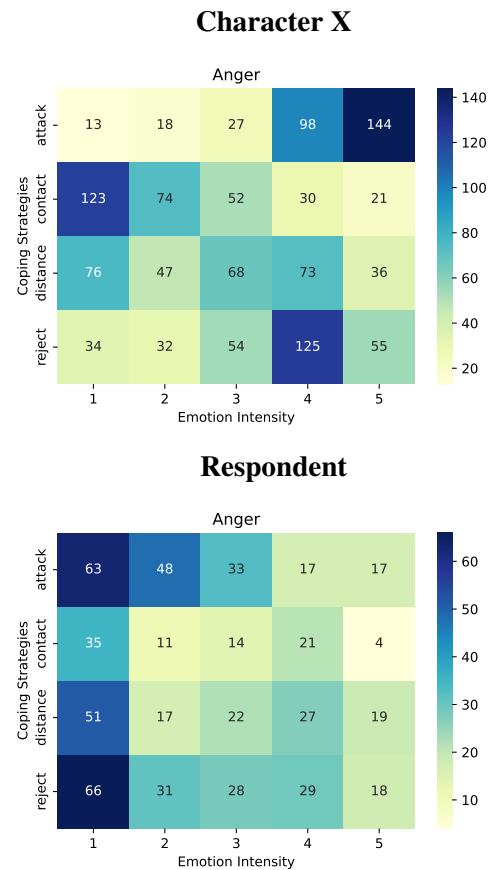


Figure 5: Comparison of anger scores assigned to character *X* and as self-assigned by participants who would not react as *X*. Numbers in each cell are the numbers of participants picking a given emotion score (intensity).

E Classification Experiments

We conduct zero-shot classification experiments on our local machines, with the quantized models PHI-2.Q8_0.GGUF, MISTRAL-7B-INSTRUCT-V0.2.Q8_0.GGUF, DOLPHIN-2.0-MISTRAL-7B.Q5_K_M.GGUF, and NOUS-HERMES-2-SOLAR-10.7B.Q5_K_M.GGUF, all downloaded from <https://huggingface.co/TheBloke>.

Table 15 reports a structured difference between the prompts (P1, P2, and P3) used in the zero-shot classification experiments. Each prompt was used in three setups, i.e., by concatenating the task instructions with X 's answer only, with the description of X 's behavior only, or with a concatenation of X 's answer and behavior.

	Prompt 1	Prompt 2	Prompt 3
Introduction	People respond to emotional situations with four different strategies.	People can oppose a view by adopting one of four emotional attitudes.	According to Roseman, there exist four emotion coping strategies, i.e., attack, contact, distance and reject.
Definitions	Attack: the experiencer responds in an aggressive manner. Contact: the experiencer responds in an understanding manner. Distance: the experiencer seeks personal space away from the stimulus. Reject: the experiencer promptly refuses the stimulus.	Attack: to right the wrong in an aggressive manner. Contact: to right the wrong with an open mindset. Distance: to seek shelter from unpleasant situations in a quiet inner space. Reject: to approach life in a firm refusal of negativity.	Attack: coming across as aggressive and combative, facing conflicts fiercely, taking action to right the wrong. Contact: acknowledging the diversity of opinions, responding with a constructive attitude, trying to solve problems in a respectful manner. Distance: seeking emotional tranquillity and self-reflection, coming across as avoidant, disengaging from conflicts. Reject: judgmental attitude, resolute attempt to refuse unpleasant situations, expressing opinions with confidence, dismissing potential conflicts.
	Please classify the following text with the one strategy being implemented in ...	Please classify the following text with the one attitude emerging from	Given these strategies, please recognize what strategy is being used by the ...
Answer	... it (choose one and only one label).	... it (choose one and only one label).	... utterer of the following text (choose one and only one label). ...
Task Behavior	... the described behavior (choose one and only one label) – note: the text is about how person X behaves in an unpleasant situation, using a coping strategy.	... the described behavior (choose one and only one label) – note: the text is about how person X behaves in an unpleasant situation, using a coping strategy.	... person behaving as described in the following text (choose one and only one label) – note: the text is about how person X behaves in an unpleasant situation, using a coping strategy.
Answer and Behavior	... it (choose one and only one label) – note: what follows includes a verbal reaction to an unpleasant situation and a description of how the utterer behaves in that context.	... it (choose one and only one label) – note: what follows includes a verbal reaction to an unpleasant situation and a description of how the utterer behaves in that context.	... utterer of the following text (choose one and only one label) – note: what follows includes a verbal reaction to an unpleasant situation and a description of how the utterer behaves in that context.

Table 15: Zero-shot setup prompts, obtained by concatenating the Introduction, the coping strategies Definitions, and one labeling Task either focusing on X 's answer, X 's behavior or a combination of the two.

Results obtained with all prompts are in Table 16. F_1 scores reported in Table 6 correspond to P3.

	Answer			Behavior			Answ.+Behav.		
	P1	P2	P3	P1	P2	P3	P1	P2	P3
phi-2	.345	.307	.356	.338	.350	.391	.397	.321	.322
mistral-2	.380	.379	.392	.473	.520	.474	.495	.476	.538
dolphin-2	.385	.376	.422	.449	.513	.550	.454	.448	.520
nous-hermes	.429	.480	.387	.482	.518	.526	.523	.529	.515

Table 16: F_1 with different prompts, with X 's answer as input (Answer), with the description of X 's behavior (Behavior), or a concatenation of both (Answ.+Behav.). Each of these input types were separately concatenated with three prompts (P1, P2, and P3), fed to the four models (rows).