Tracking Regret and Guilt:
The Context of Harm and Trait Mindfulness

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Abstract. Being exceedingly social creatures, each and every decision that an individual human makes carries with it consequences and risks that may endanger not only themselves (intrapersonal harm), but also others (interpersonal harm). This experiment (N = 215 undergraduates; 63.36% female; Mage = 21.86, SD = 2.56) compared the impact of contextual harm on emotions of regret and guilt, and examined whether the role of a trait-relevant predictor in the form of mindfulness on regret/guilt could be explained by tendency of being under-engaged (trait alexithymia) and over-engaged (trait rumination) of affective experiences. In line with our predictions, (i) interpersonal harm aroused more guilt than intrapersonal harm, but the levels of regret between the two contexts were not unalike; (ii) mindfulness negatively correlated with alexithymia, rumination, regret, and guilt; and (iii) after controlling for type of harm, the relation between mindfulness and regret/guilt was mediated by alexithymia and rumination. Although guilt depends heavily on interpersonal context while regret is induced more globally, mindfulness inversely predicts the levels of both emotions through alexithymia and rumination.

Keywords: guilt; interpersonal harm; intrapersonal harm; regret; trait mindfulness

"When you repeat a mistake, it is no longer a mistake. It is a decision."

Life is but a series of choices and decisions. Naturally, not all that we thought, said, or did bring about the consequences we expect. When they do, we celebrate, but when they don't, we curse, for with the advent of mistakes comes the weight burden we call guilt. But if our mistakes had contributed to a better life, would we come to regret them? That is to say, the feelings of guilt and regret often come hand in hand. When it comes to pragmatic reality, untangling the two complex emotions is often a task that is considerably daunting. The complexity of regret and guilt has only been recently explored in contemporary psychology. From an Eastern philosophical perspective, however, there is a time series with which we can properly frame a decision   and derive from there the proper sequence from whence regret comes and where guilt arises. An episode in the Kurukshetra War, as told in the Hindu Epic *Mahabharat*, of the 14th day of battle had the heroic Pandava champion

Ghatotkach slain by the opposing champion Karna (https://medium.com/@pranasutra/bhima-vairagya-the-death-of-ghatotkacha-a256b26289d5). However, at the sight of the fallen hero, the Pandava grand advisor Krishna instead loudly cheered and visibly danced in celebration, even hugging Arjun, another champion of the Pandavas. Filled with regret, Arjun asked Krishna—they just lost a very powerful ally of justice, so why did he celebrate? Krishna explained that   although guilt might be experienced, Ghatotkach was murdered using the divine weapon Vasavi Shakti, which was Karna's trump card and one of the very few weapons that could harm the otherwise invincible Arjun. By having the divine weapon used up to handle Ghatotkach, Arjun's survival was guaranteed, and in the bigger picture, the tides of war turned to favor the Pandavas. It is this sort of multifaceted complexity that drove this research,   especially the focus on further understanding regret and guilt, which arose in effect to a decision in the context of harm, which may be to one's own self (intrapersonal) or to others (interpersonal).

Regret is a counterfactual emotion when one believes that, had they chosen another option in the past, their present condition would have been better (Sander, 2013). Behavioral consequences of counterfactual thinking can be functional (Roese & Epstude, 2017). In regret, there is a dimension of responsibility (Martinez & Zeelenberg, 2015); anticipation of the repeat of said regret is also predictive of future decision-making (Eryilmaz et al., 2014), including in choosing for others (Kumano et al., 2021). The predictive role of anticipated regret on health behavior is stronger than the role of other anticipated negative emotions (Brewer et al., 2016).

Guilt, on the other hand, is considered a self-reflexive emotion (Sander, 2013). The need to be 'a good person' produces guilt when others are disturbed by our words or actions. Induced guilt is associated with one's negative affective conditions regarding the violation of personal moral standing or social standards (Yang et al., 2022). Guilt can increase obedience (Boster et al., 2016); anticipation of guilt predicts less self-interest in relationships (Zhang et al., 2021).

As with other affect products, how cognition assigns meaning to an emotional experience is not necessarily adaptive. Regret reduces trust levels (Martinez & Zeelenberg, 2015), while unwarranted excessive guilt is a symptom of depressive disorders (American Psychiatric Association, 2013). Through a series of three experiments, Zeelenberg and Breugelmans (2008) tested how far the differences in type of harm could be used as a reference point to distinguish regret and guilt. They concluded that   when a decision harms one or others, regret arises,   but when the decision harms only others, guilt arises. To further enrich the understanding of the dynamics between regret and guilt, this research replicated the Zeelenberg and Breugelmans (Study 2) experiment design using the same situation-based predictor of guilt and regret and adding the consideration of a person-based predictor in the form of trait mindfulness. From an interactionist principle (Schmitt et al.,

2013; Tett & Guterman, 2000), the situation-based predictor (in this study: type of harm) may be more accessible for a person low in a trait-relevant response.

Mindfulness as a trait refers to the inherent quality to pay attention and fully realize one's daily life experiences (Brown & Ryan, 2003). Trait mindfulness has been acknowledged as protective factor in both personal and professional domains (Mesmer-Magnus et al., 2017; Zhang et al., 2023). People low in trait mindfulness report higher anticipated negative affect in the form of regret and guilt (Dillard & Meier, 2021). In contrast, those high in trait mindfulness display a more adaptive response to agitation-related emotions that one 'should' do something else and become an ideal person (Senker et al., 2022). Nevertheless, the underlying mechanism regarding beneficially making use of mindfulness still warrants further research.

In a previous review, Hayes and Feldman (2004) concluded that mindfulness could decrease the likelihood of *both* under-engagement and over-engagement of affective experiences. Under-engagement may occur when an individual believes that the cause of emotional experience comes more from the situational context than their own internal condition, which is the main feature of an individual with alexithymia tendencies. This is related to the difficulty with which an individual identifies, describes, and interprets their own emotions (Bagby et al., 1994, 2020). On the other hand, an individual with the tendency to ruminate tends to display repetitive thoughts regarding cause, effect, and symptoms of negative affects (Nolen-Hoeksema et al., 2008), to the point that they find it difficult when to disengage from their emotional experiences.

Mindfulness has been shown to be negatively linked to alexithymia (e.g., Teixeira & Pereira, 2015), and neural correlates of mindful regulation have also been identified in people with a tendency to ruminate (Rosenbaum et al., 2020). A positive and significant relationship has been reported between rumination and alexithymia in clinical contexts (Pei et al., 2023), the general population (Ayaz & Dincer, 2021), and undergraduate students (Yusainy, 2017). However, there is a lack of research exploring the extent to which the two seemingly opposing dispositions could indeed work in tandem as underlying mechanisms of mindfulness toward the emotions of guilt and regret.

Specifically, in this research, the influence of harm context would be tested first towards feelings of regret and guilt (Hypothesis 1), followed by associative mapping of trait mindfulness and the two potential mediator variables (i.e., trait alexithymia and trait rumination), and also trait mindfulness and feelings of regret/guilt (Hypothesis 2). The a nalysis would then conclude with a test of whether the two traits could become parallel mediators in the relation between mindfulness and regret/guilt after controlling for type of harm (Hypothesis 3).

Method

Participants and Procedure

All experiment procedures were performed online through SurveyMonkey after obtaining the approval of an internal ethics committee. Participants were Indonesian undergraduates recruited through researchers' social media. Similar to the replicated study from Zeelenberg and Breugelmans (2008), we used no exclusion criteria since the undergraduate student population is assumed to be "ordinary people" with regards to the research variables. To minimize social desirability, participants were told that they were joining an experiment regarding 'decision-making'. Links to the experiment were open for seven days. In total, 272 people agreed to participate, but after eliminating incomplete data, the total final participants numbered 215 (79.04%), consisting of 136 females (63.26%) and 79 males (36.74%), with mean age 21.25 (SD = 1.32).

This research used a between-subject experimental design (type of harm: intrapersonal vs. interpersonal). After reading the provided information regarding the experiment and declaring their consent to participate, participants were asked to fill out general information regarding their sex, age, and the individual differences questionnaire presented in sequence from the less sensitive issue; in order, they went trait mindfulness (Mindfulness Attention Awareness Scale/MAAS; Brown & Ryan, 2003), trait alexithymia (Toronto Alexithymia Scale/TAS-20; Bagby et al., 1994), and trait rumination (Ruminative Response Scale/RRS; Treynor et al., 2003).

Participants were then randomly assigned to receive a scenario containing either intrapersonal or interpersonal harm (Zeelenberg & Breugelmans, 2008). Afterwards, all participants filled out questionnaires regarding regret and guilt (Zeelenberg & Breugelmans, 2008). At the end of the experiment, participants optionally filled out their email for a prize draw and then debriefed regarding the hypotheses of the experiment.

Experimental Manipulation and Self-Reported Measure

Two native postgraduate Indonesian students translated the types of harm scenarios regarding decision-making as well as measures of regret and guilt from Zeelenberg and Breugelmans, 2008 (Study 2). The translations were then compared by the first author, who decided on the final version.

In the interpersonal harm scenario, participants were described to be borrowing their mother's motorcycle to go to a nearby *warong* (small Indonesian traditional store). Once they arrived, they were described to carelessly leave their keys on the motorcycle. When they left the *warong* after making a purchase, just 5 minutes later, they found that the motorcycle had been stolen. In the intrapersonal scenario, alternatively, the motorcycle was described to have been their own instead of their mother's.

Regret and guilt were measured in an 8-item questionnaire regarding feelings, thoughts, action tendencies, and motivational goals associated with each emotion (4 items for each emotion). Participants gave their judgments regarding how intensely each question described their condition had the harm scenarios actually happened to them on a 6-point Likert scale of 5 (0 = *not at all*, 5 = *very strongly*). In this research, the higher the average score of the 4 items, the higher the participant's regret/guilt.

Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003) consists of 15 items from the lack of a singular attention factor and awareness of various conditions in daily life. Participants provided judgment of their experiences on a 6-point Likert scale (1 = *almost always* and 6 = *almost never*). The higher the MAAS average score, the higher the participant's trait mindfulness. The internal reliability of MAAS on Indonesian students was .82 (Yusainy, Hikmiah, et al., 2018).

Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994) consists of 20 question items from the three factors of alexithymia, which are difficulty identifying feelings (DIF; 7 items), difficulty describing feelings to other people (DDF; 5 items), and externally-oriented style of thinking (EOT; 8 items) rated on a 5-point Likert scale (1 = (1 = *complete disagreement* and 5 = *complete agreement).* The higher the TAS-20 average score, the higher the participant's trait alexithymia. The internal reliability of TAS-20 on Indonesian students was α = .81 (Yusainy, 2017).

Ruminative Response Scales (RRS; Treynor et al., 2003) consist of 10 question items covering the two factors of rumination, which are brooding (5 items) and reflection (5 items). Participants scored on a 4-point scale (1 = *rarely* and 4 = *always*) regarding the extent to which each item reflect their thoughts and feelings when they felt sad or stressed. The higher the RRS average score, the higher the trait rumination. The internal reliability of the Indonesian version of RRS was α = .75 (Yusainy, 2017).

Plan of Analyses

Three main analyses were performed using IBM Statistics 23 to test the research hypotheses. For Hypothesis 1, we used multivariate analysis of variance (MANOVA) to examine the differences between regret and guilt arising from different types of harm (intrapersonal vs. interpersonal). For Hypothesis 2, a series of zero-order correlations were carried out to test the associations between trait mindfulness and the two potential mediator variables (i.e., trait alexithymia and trait rumination) as well as with regret and guilt. Lastly, parallel mediation analyses (Hayes, 2018; Model 4) were performed separately on regret/guilt to test Hypothesis 3 on whether the two potential mediators would work in tandem on the link between mindfulness and regret/guilt after accounting for the role of the type of harm.

Results

In line with our first prediction, the result of multivariate analysis of variance (MANOVA) showed that the type of harm has differing influences on regret and guilt, F (2,212) = 24.54, $p < .001$ (Hypothesis 1). Analysis of variance (ANOVA; see Table 1) testing further showed that guilt after participants caused interpersonal harm was higher than the guilt coming from intrapersonal harm ($p < .001$). There was no difference in participant regret levels after causing either intrapersonal or interpersonal harm ($p > .29$, *ns.*).

Table 1.

Ratings of Regret and Guilt Following Intrapersonal Harm (N = 115) and Interpersonal Harm (N = 100)

Emotions			Harm		
	Intrapersonal		Interpersonal		
	M	*SD*	*M*	*SD*	*F* (1,213)
Regret	3.58	.94	3.72	.94	1.18
Guilt	2.76	1.10	3.67	.81	45.48***

Note. ***$p < .001$

As seen in Table 2, the reliability values of the scales used in this research are reasonably sufficient (Cronbach's $\alpha > .73$). Supporting our second prediction, trait mindfulness was negatively associated with both potential mediators (trait alexithymia and trait rumination) and with both regret and guilt (Hypothesis 2). In addition, there was a positive correlation between the two potential mediators with regret and guilt.

Table 2.

Zero Order Correlation and Psychometric Property of Measures (N = 215)

Scale	(1)	(2)	(3)	(4)	(5)
MAAS (1)	1				
TAS-20 (2)	-.61***	1			
RRS (3)	-.42***	.29***	1		
Regret (4)	-.29***	.30***	.42***	1	
Guilt (5)	-.21***	.27***	.34***	.41***	1
M (SD)	4.12 (.90)	2.76 (.64)	3.01 (.57)	3.64 (.95)	3.19 (1.08)
⟨ Cronbach	.88	.83	.81	.73	.76

Note. MAAS = Mindfulness Attention Awareness Scale; TAS-20 = Toronto Alexithymia Scale: RRS = Ruminative Response Scale.

No significant correlations between the above variables and participant's age ($p > .15$, *ns.*) or sex ($p > .19$, *ns.*)

***$p < .001$

Lastly, the results of separate parallel mediation analyses were presented in Table 3, displaying the extent to which alexithymia and rumination would mediate any relationships between mindfulness and regret/guilt after accounting for the type of harm (Hypothesis 3). In each model, the type of harm was entered as covariate.

Table 3.

Bootstrapped Parallel Mediation Based on 5,000 Resamples (95% Bias-Corrected CI) for Regret and Guilt (N = 215)

		Consequent													
Antecedent		M1 (TAS-20)				M2 (RRS)				Y1 (Regret)				Y2 (Guilt)		
		B	SE	p		B	SE	p		B	SE	p		B	SE	p
X (MAAS)	a1	-.43	.19	***	a2	-.27	.04	***	c'	-.04	.09	ns.		.01	.09	ns.
M1 (TAS-20)									b1	.27	.12	*		.37	.12	**
M2 (RRS)									b2	.57	.11	***		.44	.12	***
Covariate (Type of harm)		-.01	.07	ns.		.15	.07	*		.07	.12	ns.		.85	.13	***
Constant	iM1	4.54	.19	***	iM2	3.90	.19	***	iy	1.25	.74	ns.		-.47	.79	ns.
		$R^2 = 37.57$				$R^2 = 18.85$				$R^2 = 21.12$				$R^2 = 30.40$		
		$F (2, 212) = 63.79***$				$F (2, 212) = 24.62***$				$F (4, 210) = 14.05***$				$F (4, 210) = 22.93 ***$		

Note. MAAS = Mindfulness Attention Awareness Scale; TAS-20 = Toronto Alexithymia Scale; RRS = Ruminative Response Scale; Type of harm = intrapersonal (*coding* = 1) vs. interpersonal (*coding* = 2).
*p < .05; **p < .01; ***p < .001

The first parallel mediation analysis revealed that mindfulness predicted alexithymia and rumination (*p* < .001), while regret was predicted by alexithymia (*p* = .02) and rumination (*p* < .001). As expected, the relationship between mindfulness and regret was mediated by alexithymia (95% CI [-.22, -.01]) and rumination (95% CI [-.25, -.08]). After accounting for both mediators, the direct effect of mindfulness was no longer significant (*p* > .64, *ns.*). The impact of the type of harm in this model was also insignificant (*p* > .55, *ns.*). Therefore, it can be concluded that alexithymia and rumination played a role as an underlying relational mechanism between mindfulness and the emotions of regret, regardless of whether the harm faced was intrapersonal or interpersonal.

The second parallel mediation analysis showed that guilt was also predicted by alexithymia (*p* < .01) and rumination (*p* < .001), but not by the direct effect of trait mindfulness (*p* > .90, *ns.*). Similarly, the relationship between mindfulness and guilt was mediated by alexithymia (95% CI [-.25, -.06]) and rumination (95% CI [-.20, -.05]). However,

the level of guilt was influenced by the type of harm ($p < .001$). In other words, although alexithymia and rumination were underlying relational mechanisms between mindfulness and the emotions of guilt, the emotion was still predicted by the context of interpersonal harm.

Discussion

This research aims to understand the dynamics between the situational context in the form of harm and the individual mechanisms that underlie the benefits of trait mindfulness towards regret and guilt. Consistent with Zeelenberg and Breugelmans (2008), we found that the context of harm following a decision is not the main distinguishing factor between regret and guilt. Participants in this research reported intrapersonal regret that was not unlike interpersonal regret, while interpersonal guilt was more dominant compared to intrapersonal guilt. This supports their original proposal that regret is an emotion with a wider scope than guilt. Consequently, individuals experiencing guilt could gain insights when focusing on the social nature of harm, whereas those experiencing regret should consider both the social and self-inflicted harm of their past actions.

Through this research, the context of harm as a situational trigger to regret and guilt was further examined by considering person-based predictors from both emotions, specifically in terms of mindfulness, alexithymia, and rumination. We found that individuals with a higher mindfulness disposition reported lower levels of alexithymia, rumination, regret, and guilt. Through mindfulness, every experience is lived through with full attention without an effort to change anything (Yusainy, Nurwanti, et al., 2018). The combinations between the capacities to sustain attention on uncomfortable experiences while being aware of any present thinking that one does, including about the past, may therefore lessen the emotional impact of one's previous decisions.

Crucially, the associations of mindfulness with regret and guilt are both mediated by trait alexithymia and trait rumination. Therapeutic interventions that directly target trait alexithymia (Pinna et al., 2020) or trait rumination (Watkins, 2015) are often hindered by the nature of both traits, which tend to be stable cues of deficiencies in emotional processing. On the other hand, the immediate benefits of brief mindfulness inductions on various emotion-related processes have been well documented (Leyland et al., 2019), as well as longitudinal research findings that trait mindfulness can be increased through mindfulness training (de Vibe et al., 2018). Being mindful in daily life is hence essential to tackle the hurdles of both under-engagement and over-engagement of affective experiences.

Beyond the likelihood for guilt and regret to co-exist, individuals with a higher trait mindfulness are typically superior in differentiating their emotional experiences (Tong & Keng, 2017). The benefits of emotional differentiation have been reported in various

samples by Seah and Coifman (2022). In a psychotherapy setting, allowing patients to engage in emotional differentiation during sessions is likely to produce a greater treatment response (Lazarus & Fisher, 2021). Although the results from our mediation analyses should not be interpreted as evidence for clinical assessment of regret to ignore the impact of contextual harm (or assessment of guilt to emphasize solely on the interpersonal harm), our data highlight the importance of assessing trait-relevant response with regards to emotional differentiation and regulation in regret/guilt.

The limitations of this research can be addressed by further research. Davidai and Gilovich (2018) found that when participants were asked to think about their most intense experience of regret, ought-related regrets were more soluble than ideal-related regrets. Intense guilt was associated more with actual/ought self-discrepancies than intense regret (Zhang, Zeelenberg, Summerville, et al., 2021). Both studies indicate the necessity to compare people's most enduring regret/guilt. Further, the behavioral manifestations of regret and guilt, aroused by harm context, certainly need   further probing. Guilt has been identified as relational mediator between trait alexithymia and suicide risk in male subjects (Rice et al., 2020). The context in the form of consequences of a decision that brings harm to one's own self or others also cannot be generalized to the arousal of regret and guilt in different contexts.

The consistency of this research also needs to be examined by paying particular attention to the complexity of the variables being researched. For instance, Oflazian and Borders (2022) concluded on an inconsistency in the correlations between trait rumination and guilt, which may have occurred because guilt was empathy-driven or fear-driven. Lab experiments by Yusainy (2017) that specifically examined dimensions of trait alexithymia and rumination also found various forms of associations from each of those dimensions to the degree of emotional hypersensitivity.

Conclusion

There are three conclusions that can be drawn from this research. Firstly, context (intrapersonal vs. interpersonal) produces distinguishable influence on the arousal of regret and guilt; guilt is influenced by interpersonal harm, while regret is influenced by either intrapersonal or interpersonal harm. Secondly, the personal factor in the form of trait mindfulness has a negative association with both potential mediators (trait alexithymia and trait rumination) or with feelings of regret/guilt. Thirdly, trait alexithymia and trait rumination are both parallel mediators in the relation between mindfulness and regret/guilt, although guilt is still predicted by the context of interpersonal harm.

Recommendation

Neither regret nor guilt are basic human emotions. Both emotions recognize domain, scale, and dimensions. Where they occur, the mental processes that underlie both of their processes can significantly differ. Regardless of the various limitations, this research supports the notion that information about the tendency to under- or over-engage affective experiences can be put to use in integrated risk assessments for mindfulness-based interventions that directly target the emotions of regret and guilt.

Declaration

Author's Contribution

All authors contributed significantly to the reserach. CY and WW designed the study and wrote the submitted paper. CY, MHAB, JAT, and S collected and analyze the data. All authors read and approved the final version of the manuscript.

Conflict of Interest
We have no conflicts of interest to disclose.

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