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What is normal? Dimensions of action-inaction normality and their impact on regret in the action-effect

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ABSTRACT

The widely-replicated action-effect describes a phenomenon in which negative outcomes are associated with higher regret when they are a result of action compared to inaction. The highly influential norm-theory theorised that the effect could be explained using the concept of normality, arguing that inaction is more “normal”. I aimed to clarify the concept of normality and examine the impact on regret in the action-effect by contrasting three identified categories: past-behaviour normality, expectations normality, and social-norms normality. In three exploratory experiments ($N_1 = 213$, $N_2 = 300$, $N_3 = 303$) and one concluding pre-registered combined experiment ($N = 403$) I found that the three normality categories had distinct effects with consistent medium to strong impact on regret in the action-effect ($d = .51$ to $d = .85$) and no interactions. Action-effect was significantly weakened into an inaction-effect in the joint effects of any two types of the three normality categories ($d = 1.56$ – 1.61) and with all three combined ($d = 2.75$). In total, I concluded three replications for effects of each of the normality dimensions, overall nine successful replications of previous findings. All materials, data, and code are available on <https://osf.io/wmkpe/>.

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The classic action-effect (Kahneman & Tversky, 1982a) describes a phenomenon in which people associate stronger emotional regret with negative outcomes when the outcomes are a result of an action compared to when they are a result of an inaction. The effect is well-established, extends beyond cultures (Chen, Chiu, Roese, Tam, & Lau, 2006; Gilovich, Wang, Regan, & Nishina, 2003; Komiya, Watabe, Miyamoto, & Kusumi, 2013), has been widely replicated (e.g. Connolly, Ordonez, & Coughlan, 1997; Gilovich, Medvec, & Chen, 1995; Landman, 1987; N'gbala & Branscombe, 1997; Ritov & Baron, 1995; Zeelenberg, Van Dijk, & Manstead, 1998), and is considered one of the strongest effects in the regret literature (Gilovich & Medvec, 1994, 1995).

Theories have since offered possible explanations for this phenomenon. Several years following the publication of the action-effect, Kahneman and Miller (1986) summarised findings in the growing field of

judgment and decision-making to suggest “norm theory” as an overarching theoretical framework. They argued that people are influenced by the concept of normality, in that judgments and emotions are experienced in reference to what is perceived to be normal, and that this is a context-sensitive construed perception. Norm theory suggested that the action-effect can also be explained using the concept of normality. The main premise was that regret is stronger when behaviour leading to the outcome is more abnormal and mutable, in that it is easier to think of normal alternatives that could have prevented the unfortunate outcome. In the context of the action-effect, actions would be associated with stronger regret compared to inactions presumably because inaction is the norm in the classic action-effect scenario and it is therefore easier to think of inaction alternatives to action than of action alternatives to inaction (Kahneman & Miller, 1986). In

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the years since, norm theory has received thousands of citations and has been successfully applied to explain many biases and to predict decision-making behaviours in various domains. However, norm theory was very vague in its reference to the action-effect and the term of normality and has left many important questions unanswered. Scholars studying the action-effect have since tested various aspects of their interpretations of the concept of normality, diverging into different aspects of what normality means for the action-effect.

One key element that norm theory did not specify and left ambiguous was what normality referred to in their explanation of the action-effect raising the question – what did they mean by “normal”? Or, put differently, normal in what way? In what sense is inaction more normal in the action-effect situation? Is it that we are all generally more oriented towards inaction (general social-norms)? Or maybe it is that we perceive the described decision-makers to typically refrain from decisions to act (past-behaviour)? Or perhaps decision-makers are expected to not act in decision situations involving a choice between action and inaction or in certain decision-making roles (role/situation expectations)? Are these examples of normality distinct or do they all represent one cognitive perception of normality? If either general social-norms, typical past-behaviour, or role-situation expectations were for taking action rather than for not acting, would that weaken or even reverse the action-effect? What if the types of normality conflict?

The present investigation aims to clarify the concept of normality, especially in the context of the action-effect, and contrast between several types of normality to examine their impact on regret over actions versus inactions.

Action-effect and normality

The action-effect was first introduced by Kahneman and Tversky (1982a) using the following scenario (p. 173):

Mr. Paul owns shares in company A. During the past year he considered switching to stock in company B, but he decided against it. He now finds out that he would have been better off by \$1,200 if he had switched to the stock of company B.

Mr. George owned shares in company B. During the past year he switched to stock in company A. He now finds that he would have been better off by \$1,200 if he had kept his stock in company B.

Who feels greater regret?

The results for this demonstration were reported in Kahneman and Miller (1986) with 92% of 138 participants rating action George as more likely to experience regret than inaction Paul. Kahneman and Tversky (1982a) explained that it is easier for George to imagine not taking action than it would be for Paul to imagine taking action. Counterfactuals, alternatives realities of what might have been, are an important factor in the experience of regret, in that the higher the number of (upwards) counterfactuals elicited, the higher the likelihood for regret (Kahneman & Tversky, 1982b).

Several years later, Kahneman and Miller (1986) introduced the concept of normality, what is perceived or construed as normal in a situation, arguing that it influences counterfactual thinking and regret. They provided an example asking participants about two types of normality (p. 145):

Mr. Jones almost never takes hitch-hikers in his car. Yesterday he gave a man a ride and was robbed.

Mr. Smith frequently takes hitch-hikers in his car. Yesterday he gave a man a ride and was robbed.

Who do you expect to experience greater regret over the episode?

The scenario first addresses the concept of normality in regards to what is considered normal for the focal person, or as the authors put it – “actions that are out of character”. Abnormal behaviour elicits more counterfactual thinking, thoughts of “what might have been”, because it is easier to think of a person with consistent behaviour. In accordance with norm theory predictions for this scenario, regret over the unfortunate outcome of being robbed was rated as higher for Mr. Jones who acted abnormally than that of Mr. Smith who acted as he usually did (88% of 138 participants). Going beyond normality in terms of past-behaviour, the scenario also included a second question – “who will be criticised most severely by others?”, which introduced a different type of normality – the perceived prevalent social-norms in regards to the behaviour observed. In this case, 77% of participants perceived Mr. Smith to act abnormally and indicated that his risky behaviour taking hitchhikers is more likely to be criticised by society. In this scenario, past-behaviour normality and social-norms normality are two different types of information, and the two can both be used to form an overall perception of normality. In this specific scenario, past-behaviour normality seems to have had a higher impact on

regret than did social-norms normality, as Mr. Jones was said to have experienced stronger regret because it was atypical to his behaviour and despite receiving less criticism from others for his general behaviour. This could be because past normality was made more salient in that specific scenario, leading to a construed perception of normality based on the information provided. It might also have been that past-behaviour normality is generally more easily retrieved, or more readily available, for the person to be used as reference for expectations to affect feelings of regret. Yet, this is further complicated by an example for an opposite effect by Hur, Roese, and Namkoong (2009). They found that social-norms had stronger impact than past-behaviour, suggesting that under some circumstances social-norms could have stronger effects.

These examples highlight the core aspects of norm theory. First, (upwards) counterfactual thought is associated with stronger regret, and since normality matters in the construal of counterfactuals then normality also affects associated feelings of regret. Second, there are different types of normality. Third, the different types of normality may affect regret in different ways, and some types of normality may be more salient or relevant than others for perceived or experienced affect in a specific scenario or situation. The types of regret may also both jointly impact the overall perceived affect.

Normality dimensions in the action-effect

Feldman and Albarracín (2017) provided an initial mapping of normality in the context of the action-effect and suggested the conceptual differentiation between three normality dimensions: (1) past-behaviour (intrapersonal or consistency) normality, (2) expected role/situational behaviour normality, and (3) general social-norms normality. Kahneman and Miller (1986) argued that the reason for the action-effect is that the perceived norms are for inaction, making action more mutable and therefore more strongly associated with regret. If we use this normality typology, this would mean that the action-effect would be weakened or even reversed if: (1) past-behaviour was to act, (2) role/situational expectations are to act, or (3) general social-norms are action-oriented.

The Feldman and Albarracín (2017) normality typology has not been empirically tested and the impact of each of the normality categories on the action-effect

has only been tested separately by different scholars. Past-behaviour and personal inclinations have been shown to weaken and reverse the action-effect, such that risk-takers and action-oriented decision-makers tend to regret inaction more than action when things go badly (McElroy & Dowd, 2007; Pieters & Zeelenberg, 2005; Seta, McElroy, & Seta, 2001; Seta & Seta, 2013). The impact of expectations normality over the action-effect has also received support, showing that action expectations from soccer goal-keepers resulted in stronger regret for inaction (Bar-Eli, Azar, Ritov, Keidar-Levin, & Schein, 2007), and that past negative outcomes which set expectations for taking remedy action resulted in an “inaction-effect”, meaning stronger regret for inaction (Inman & Zeelenberg, 2002; Zeelenberg, Van den Bos, Van Dijk, & Pieters, 2002). Lastly, examining social-norms normality, both injunctive and descriptive social norms have been shown to weaken and even reverse the action-effect (Feldman & Albarracín, 2017).

To summarise the findings above, there is support for norm theory arguments that the action-effect is affected by normality and that perceived inaction norms are at least partially responsible. Different studies provided different methods to test normality, yet it remains unclear whether these studies examine one single unified construct of normality or whether they can be mapped onto the three suggested conceptual types of normality (Feldman & Albarracín, 2017).

The present investigation

I aim to build on these findings and further clarify normality in the action-effect. I provide a first test of the normality taxonomy and the underlying assumption that the three normality categories are distinguishable and do not simply represent a single normality effect (Feldman & Albarracín, 2017). If the normality categories are indeed distinct: (1) does one normality category have stronger effect compared to the others? (2) do normality categories interact in their impact over the action-effect? (3) would a combination of two or more normality categories together result in stronger effects?

To answer these questions, I conducted four experiments. An overview of the studies is provided in Table 1 and the results of all studies and a mini meta-analysis are summarised in Table 12. An important contribution of this investigation is that the four experiments were designed to include direct very

Table 1. Summary of experimental designs: factors, scenarios, and manipulations.

| Exp | Social-norms | Expectations | Past-behaviour | Action-effect scenario | Normality manipulations |
|-----|--------------|--------------|----------------|---|---|
| 1 | V | V | | Soccer coaches (Zeelenberg et al., 2002) | Feldman & Albarracín, 2017 + Zeelenberg et al., 2002 |
| 2 | V | | V | Investors ^a (Kahneman & Tversky, 1982a) | Feldman & Albarracín, 2017 + Seta et al., 2001 |
| 3 | | V | V | Soccer coaches (Zeelenberg et al., 2002) | Zeelenberg et al., 2002 + new |
| 4 | V | V | V | Soccer coaches (Zeelenberg et al., 2002) | Feldman & Albarracín, 2017 + Zeelenberg et al., 2002 + new |

close replications of previous manipulations of published findings.

Open science

Supplementary includes power analyses and full materials for all experiments, and data and code were made available on the Open Science Framework (OSF; <https://osf.io/wmkpe/>). Effects documented in the literature for the manipulations used in the experiments ranged from $d = .91$ to $d = 1.70$. Due to the very large effects, power analyses required relatively small samples, yet I decided to aim for a minimum of 50 participants per cell for Experiments 1–3. Pre-registered Experiment 4 aimed for 80% power to detect $d = .51$, as the smallest effect found for contrasts found in Experiments 1–3, suggesting 49 per condition (400 overall).

Experiment 1: social-norms normality and expectations normality

Method

A total of 231 undergraduate students from a university in Hong Kong participated in return for partial course credit ($M_{\text{age}} = 18.71$, $SD_{\text{age}} = .87$; 139 females). Participants were randomly assigned to one of four conditions in a 2×2 experimental design manipulating two factors – social-norms (action, inaction) and expectations (action, inaction). Participants were first presented with the social-norms manipulation (Feldman & Albarracín, 2017) as follows:

Action social-norms condition: Imagine a society that is mostly driven by action. Most, if not all, of the people living in this society are very proactive and action oriented, strongly valuing action over inaction. The norms in this society are for people to keep busy and minimize idle time.

Inaction social-norms condition: Imagine a society that is mostly driven by inaction. Most, if not all, of the people living in this society are very passive and oriented towards inaction, strongly valuing the status-quo over

taking action. The norms in this society are for people to refrain from action and maximize idle time.

Participants were asked several questions about the described society, with a manipulation check – “In such a society which of the following is the more normative behavior?” (action / inaction / neither). They were then presented with a scenario taking place in that society manipulating situational expectations (Zeelenberg et al., 2002):

Now try and imagine this [action/inaction]-driven society, and the following situation taking place in that society: In this [action/inaction]-driven society, there are two soccer teams. John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

[Action expectations: Both coaches lost the last game their teams played with a score of 4–0.]

[Inaction expectations: Both coaches won the last game their teams played with a score of 4–0.]

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

Coach John decides to take action: He replaces three players with three new players.

Coach David decides to not take action and to not change his team’s lineup.

Participants were then asked to rate which of the two coaches is more likely to feel **regret** following a loss and **joy** following a win – “The results of the match on Sunday is that both teams [lost/won] 3–0. Consider that both coaches are members of an [action/inaction]-driven society, and both coaches were influenced by results of the first game. Who feels greater [regret/joy] over losing the game, coach John or coach David?” (1 = *Definitely David for not taking action*; 6 = *Definitely John for taking action*).

Results and discussion

A chi-square test of the manipulation-check indicated that the social-norms manipulation was successful and

participants in the action society condition perceived action as more common than in the inaction society condition (action in action condition: 104/114; inaction in inaction condition: 105/117; $\chi^2(2, N = 231) = 175.95, p < .001$).

Means, standard deviations, and Cohen's d effects for perceived regret and perceived joy are provided in Tables 2 and 3, ANOVA findings detailed in Table 4, and regret findings plotted in Figure 1. Both manipulations affected perceived regret for action-inaction with a larger effect for the society manipulation ($F(1, 227) = 40.46, p < .001$; partial $\eta^2 p = .15$; $d = .81$) compared to the expectations manipulation ($F(1, 227) = 30.67, p < .001, \eta^2 p = .07$; $d = .51$). Meaning, that the classic action-effect in which actions are regretted more than inactions was weakened by both normality manipulations. The combination of the two manipulations resulted in the strongest effect (contrast between action-action and inaction-inaction conditions: $d = 1.61$) with a reversal of the classic action-effect to stronger regret for inaction ($M = 2.81, SD = 1.26$, on a scale of 1–6; one sample t -test from 3.5: $t(56) = 4.13, p < .001$).

Table 2. Experiment 1: means, standard deviations, and Cohen's d effects for perceived regret.

| | Action expectations | Inaction expectations | Cohen's d | Total |
|-------------|---------------------|-----------------------|-------------|-------------|
| Action | 2.81 (1.26) | 3.49 (1.42) | .52 | 3.15 (1.38) |
| Society | [57] | [57] | | [114] |
| Inaction | 3.86 (1.51) | 4.64 (1.02) | .60 | 4.25 (1.34) |
| Society | [59] | [58] | | [117] |
| Cohen's d | .76 | .94 | – | .81 |
| Total | 3.34 (1.49) | 4.07 (1.36) | .51 | 3.71 (1.47) |
| | [116] | [115] | | [231] |

Note: Parentheses indicate standard deviation. Brackets indicate the number of participants.

Table 3. Experiment 1: means, standard deviations, and Cohen's d effects for perceived joy.

| | Action expectations | Inaction expectations | Cohen's d | Total |
|-------------|---------------------|-----------------------|-------------|--------|
| Action | 4.33 (1.30) | 4.16 (1.24) | .14 | 4.25 |
| Society | [57] | [57] | | (1.27) |
| | | | | [114] |
| Inaction | 4.32 (1.40) | 4.14 (1.37) | .13 | 4.23 |
| Society | [59] | [58] | | (1.38) |
| | | | | [117] |
| Cohen's d | .01 | .02 | – | .01 |
| Total | 4.33 (1.34) | 4.15 (1.30) | .14 | 4.24 |
| | [116] | [115] | | (1.32) |
| | | | | [231] |

Note: Parentheses indicate standard deviation. Brackets indicate the number of participants.

There were no significant differences between the action-norms/inaction-expectations condition and the inaction-norms/action-expectations condition ($p = .173ns, d = .26$), there was no interaction between the two factors ($F(1, 227) = 0.07, p = .797, \eta^2 p = .00$), and neither factors nor the interaction affected perceived joy ($p > .305, \eta^2 p < .01, d < .14$).

In summary, these findings are in strong support of both social-norms normality and expectations normality as significant factors in weakening the action-effect. Both norm categories affected perceived regret simultaneously, with social-norms normality showing a slightly stronger effect, the joint effect resulting in a complete reversal of the action-effect into an inaction-effect (stronger regret for inaction compared to action), and the two normality categories did not interact.

Experiment 2: social-norms normality and past-behaviour normality

Method

A total of 300 American MTurk participants were recruited online using TurkPrime.com (Litman, Robinson, & Abberbock, 2016) ($M_{\text{age}} = 36.58, SD_{\text{age}} = 11.83$; 173 females). Participants were randomly assigned to one of six conditions in a 2×3 experimental design manipulating social-norms (action, inaction, and control) and past-behaviour (action, inaction). This was the first time I had used the past-behaviour normality manipulation and I had to make adjustments to the manipulation to work well with the social norms manipulation. I therefore added a control to the social norms manipulation so that I could examine past-behaviour normality effects without the social-norms manipulation, and then use that for comparison.

Participants were presented with a scenario adjusted from the classic action-effect experiment (Kahneman & Tversky, 1982a) describing Paul and George as employees of an investment firm who are faced with a dilemma or whether or not to switch their initial investment. The scenarios first manipulated the company action-inaction employee behavioural norms (Feldman & Albarracín, 2017) and then whether the employees typically switched their investments or not (Seta et al., 2001).

[Action behavioral norms: Paul and Mr. George are stock traders who work for A&M Finance. Most, if not all, of the stock traders working for A&M Finance are very action-

Table 4. Experiment 1: ANOVA results.

| | Sum of Squares | df | Mean Square | <i>F</i> | <i>p</i> | η^2p |
|---|----------------|-----|-------------|----------|----------|-----------|
| Social norms normality | 70.12 | 1 | 70.123 | 40.459 | <.001 | 0.15 |
| Expectations normality | 30.67 | 1 | 30.673 | 17.698 | <.001 | 0.07 |
| Social norms normality * Expectations normality | 0.12 | 1 | 0.115 | 0.066 | 0.797 | 0.00 |
| Residuals | 393.44 | 227 | 1.733 | | | |

driven, eager and proactive decision makers, strongly valuing action over inaction. The norms in this company are for people to keep looking for new opportunities for investment with the unofficial motto of “go for it!”

Inaction behavioral norms: Mr. Paul and Mr. George are stock traders who work for B&N Finance. Most, if not all, of the stock traders working for B&N Finance are very careful and cautious decision makers, strongly valuing the status-quo over taking action. The norms in this company are for people to not act unless they are certain it is necessary, with the unofficial motto of “if it isn’t broken, don’t fix it!”

Neutral behavioral norms: Mr. Paul and Mr. George are stock traders who work for C&O Finance.]

[**Action past-behavior:** Paul and George are employees favoring action. In past investment decision situations when Paul and George were faced with the options of taking action or not taking action they have shown a clear preference for action.

Inaction past-behavior: Paul and George are employees favoring the status-quo. In past investment decision situations when Paul and George were faced with the options of taking action or not taking action they have shown a clear preference for inaction.]

Paul has made the decision to invest in company A. During the past year he considered switching to invest stock in company C, but he decided against it. He now finds out that the investment would have been better off by \$1,000,000 if he had switched to the stock of company C.

George has made the decision to invest in company B. During the past year he switched the investment to stock in company A. He now finds out that the investment would have been better off by \$1,000,000 if he had kept his investment in stock for company B.

The scenario was followed by comprehension questions that the participants had to answer correctly in order to proceed to the next page – “What are the social-norms in Paul’s and George’s company?” (action/inaction/it doesn’t say), “What are Paul and George’s past behavioral preferences?” (action/inaction/it doesn’t say), “[Paul’s | George’s] final investment decision involved which of the following?” (Switching-action/Not switching-inaction), “Paul and George both had finally invested in which company?” (A/B/C).

Finally, participants were presented with two manipulation checks (“Whose investment decision is more common in the company?” and “Whose

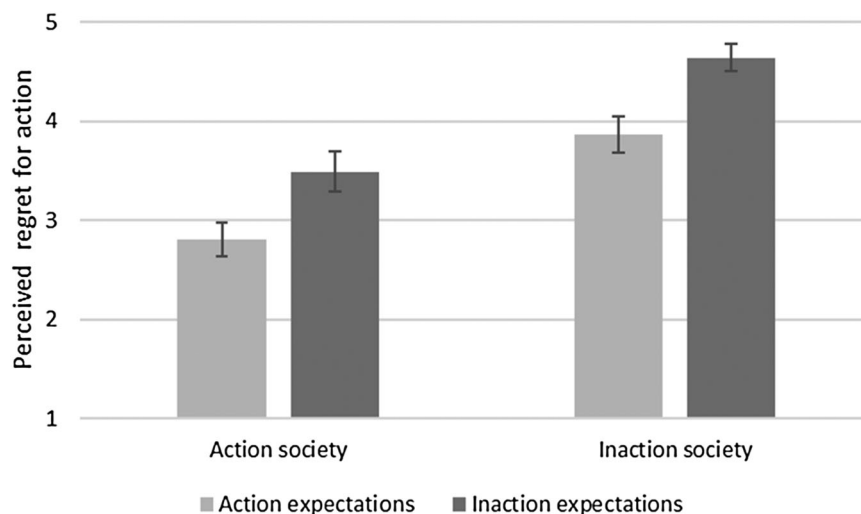


Figure 1. Experiment 1 plot for perceived regret (1 = higher perceived regret for inaction; 6 = higher perceived regret for action). Error bars indicate standard error.

Table 5. Experiment 2: means and standard deviation for perceived regret.

| Norms | Action past-behaviour | | | Inaction past-behaviour | | |
|----------------|-----------------------|-----------|----------|-------------------------|-----------|----------|
| | <i>M</i> | <i>SD</i> | <i>N</i> | <i>M</i> | <i>SD</i> | <i>N</i> |
| Action norms | 2.54 | 1.34 | 54 | 3.58 | 1.76 | 53 |
| Inaction norms | 4.12 | 1.52 | 52 | 4.66 | 1.41 | 50 |
| Control norms | 3.09 | 1.67 | 47 | 4.30 | 1.27 | 44 |

investment decision is more in line with past behaviour?") and a question regarding **perceived regret for action** ("Considering the company behavioral norms and Paul and George's personal behavioral tendencies, who feels greater regret over his investment decision?") (1 = *Definitely inaction Paul*; 6 = *Definitely action George*; for the three questions).

Results and discussion

Two-way analyses of variance (ANOVA) of the manipulation checks showed that the manipulations were successful. Participants rated higher action past-behaviour in the action past-behaviour conditions ($M = 4.58$, $SD = 1.46$) than in the inaction past-behaviour conditions ($M = 2.10$, $SD = 1.28$; $F(1, 294) = 263.90$, $p < .001$, $\eta^2 p = .47$). Participants rated action company norms highest in the action norms conditions ($M = 4.91$, $SD = 1.01$), lowest in the inaction norms conditions ($M = 2.18$, $SD = 1.44$), with rating in control conditions falling in between ($M = 3.68$, $SD = 1.18$; $F(2, 294) = 135.31$, $p < .001$, $\eta^2 p = .48$).

Means, standard deviations for perceived regret are detailed in Table 5 and plotted in Figure 2. ANOVA findings are provided in Table 6, and plots and post-hoc comparisons are provided in the supplementary (see "Additional findings – Experiment 2").

I first examined the neutral social-norms condition with a *t*-test contrast of action and inaction past-behaviour, and found that past-behaviour normality had a strong impact on the action-effect ($d = .82$, $p < .001$). Examined together, both manipulations affected perceived regret for action-inaction with a larger effect for the social-norms normality manipulation ($F(2, 294) = 20.24$, $p < .001$, $\eta^2 p = .12$; $d = .85$) compared to the past-behaviour normality manipulation ($F(1, 294) = 28.68$, $p < .001$, $\eta^2 p = .09$; $d = .59$).

Mirroring results from Experiment 1, the combination of the two manipulations resulted in the strongest effect (contrast between action-action and inaction-inaction: $d = 1.56$), again with a reversal of the classic action-effect to stronger regret for inaction ($M = 2.54$, $SD = 1.34$, on a scale of 1–6; one sample *t*-test from 3.5: $t(53) = 5.26$, $p < .001$).

There were no significant differences between the action-norms/inaction-past-behaviour condition and the inaction-norms/action-past-behaviour condition ($p = .101$ ns, $d = .33$), and there was no interaction between the two factors ($F(2, 294) = 2.97$, $p = .272$, $\eta^2 p = .01$).

In summary, the pattern of results for the action-inaction contrasts was very close to that of Experiment

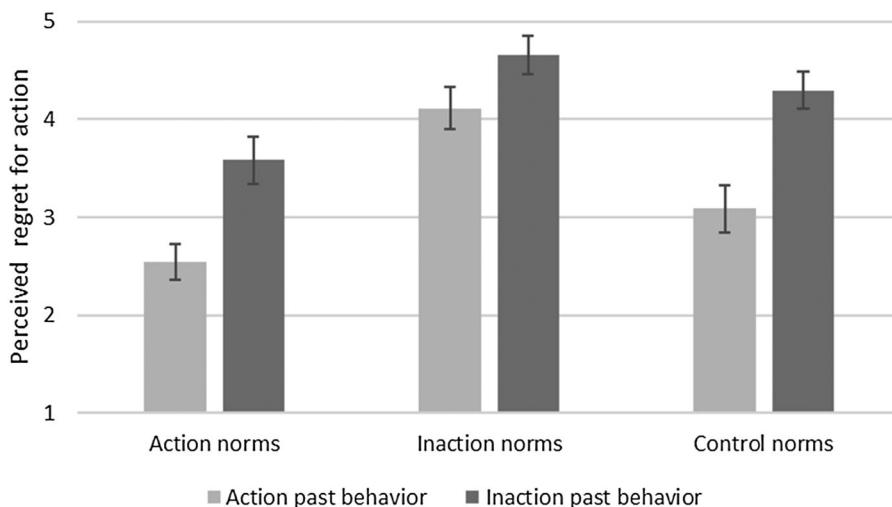
**Figure 2.** Experiment 2 plot for perceived regret (1 = higher perceived regret for inaction; 6 = higher perceived regret for action). Error bars indicate standard error.

Table 6. Experiment 2: ANOVA table.

| | Sum of Squares | df | Mean Square | <i>F</i> | <i>p</i> | $\eta^2 p$ |
|--|----------------|-----|-------------|----------|----------|------------|
| Social norms normality | 91.92 | 2 | 45.96 | 20.24 | <.001 | 0.121 |
| Past behaviour normality | 65.13 | 1 | 65.13 | 28.68 | <.001 | 0.089 |
| Social norms normality \times Past behaviour normality | 5.94 | 2 | 2.97 | 1.31 | 0.272 | 0.009 |
| Residuals | 667.64 | 294 | 2.27 | | | |

1. Although in Experiment 2 the contrast was between social-norms and past-behaviour, rather than with expectations used in Experiment 1, and despite different manipulations used and different samples, the similarity in results provides strong support for normality as a significant factor weakening the action-effect. The inclusion of the control condition revealed that both the action and the inaction manipulations had an impact on the action-effect. Setting normality to inaction strengthened the action-effect, whereas action normality weakened the action-effect.

Experiment 3: expectations normality and past-behaviour normality

Method

A total of 303 Americans MTurk participants were recruited online using TurkPrime.com ($M_{\text{age}} = 36.66$, $SD_{\text{age}} = 11.33$; 161 females). Participants that took part in Experiment 2 were not allowed to participate in the study.

Participants were randomly assigned to one of four conditions in a 2×2 experimental between-subject design manipulating two factors: past-behavioural tendency (action versus inaction) and situational expectations (action versus inaction). I adjusted the scenario used in Experiment 1 (based on: Zeelenberg et al., 2002). The scenarios first manipulated action-inaction past behavioural tendency and then the expectations for action-inaction, as follows:

John and David both coach soccer teams. John is the coach of BlueBlue, and David is the coach of RedRed.

[Action past-behavior condition: Both John and David are soccer coaches that favor action. In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for action and making a change.

Inaction past-behavior condition: Both John and David are soccer coaches that favor the status-quo. In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for inaction and not changing the line-up.]

[Action expectations: Both coaches lost the last game their teams played with a score of 4–0. This puts pressure on both to change the line-up (action) to avoid another loss.

Inaction expectations: Both coaches won the last game their teams played with a score of 4–0. This puts pressure on both of them to keep the current line-up (inaction) to repeat another win.]

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the team line-up or leave it to be the same as the team who played in the last game.

Coach John decides to take action: He replaces three of the players with three new players.

Coach David decides to not take action and to not change his team's line-up.

The scenario was followed by comprehension questions – “What are John and David's past behavioral preferences?” (Change-action/Status-quo-inaction), “What was the outcome of the last game played?” (lost the last game – pressure to take action / won the last game – pressure to keep the status-quo), “Finally, what did [John | David] decide to do for the upcoming game?” (Change the lineup – action / Keep the same line-up – inaction).

Finally, as in Experiment 1, participants were asked to rate which of the two coaches is more likely to feel regret following a loss and to feel joy following a win (1 = *Definitely David for not taking action*; 6 = *Definitely John for taking action*).

Results and discussion

Means, standard deviations, and Cohen *d* effects for perceived regret and perceived joy are provided in Table 7 and Table 8 and regret is plotted in Figure 3. ANOVA results are provided in Table 9. Both manipulations affected perceived regret for action-inaction with a slightly larger effect for the expectations manipulation ($F(1, 299) = 104.03$, $p < .001$, $\eta^2 p = .15$; $d = .81$) compared to the past-behaviour manipulation ($F(1, 299) = 60.26$, $p < .001$, $\eta^2 p = .09$; $d = .60$). Again, the classic action-effect

Table 7. Experiment 3: means, standard deviations, and Cohen's *d* effects for perceived regret.

| | Action expectations | Inaction expectations | Cohen's <i>d</i> | Total |
|-------------------------|----------------------|-----------------------|------------------|-------------------------|
| Action past-behaviour | 2.33 (1.26) [75] | 3.48 (1.54) [75] | .82 | 2.91 (1.52) [150] |
| Inaction past-behaviour | 3.20 (1.44) [75] | 4.40 (1.35) [78] | .86 | 3.81 (1.52) [153] |
| Cohen's <i>d</i> | .64 | .64 | – | .60 |
| Total | 2.77 (1.42) [150] | 3.95 (1.51) [153] | .81 | 3.36 (1.58) [303] |

Note: Parentheses indicate standard deviation. Brackets indicate the number of participants.

Table 8. Experiment 3: means, standard deviations, and Cohen's *d* effects for perceived joy.

| | Action expectations | Inaction expectations | Cohen's <i>d</i> | Total |
|-------------------------|----------------------|-----------------------|------------------|-------------------------|
| Action past-behaviour | 4.40 (1.37) [75] | 4.09 (1.53) [75] | .21 | 4.25 (1.46) [150] |
| Inaction past-behaviour | 4.67 (1.27) [75] | 4.40 (1.47) [78] | .20 | 4.53 (1.38) [153] |
| Cohen's <i>d</i> | .20 | .20 | – | .20 |
| Total | 4.53 (1.32) [150] | 4.25 (1.51) [153] | .20 | 4.39 (1.42) [303] |

Note: Parentheses indicate standard deviation. Brackets indicate the number of participants.

was weakened by both normality manipulations of expectations normality and past-behaviour normality. The combination of the two manipulations resulted in the strongest effect (contrast between action-action and inaction-inaction: $d = 1.59$), in which the classic action-effect was reversed to an "inaction-effect" with stronger regret for inaction ($M = 2.33$, $SD = 1.26$, with 3.5 being the midpoint; one sample *t*-test from 3.5: $t(74) = 8.04$, $p < .001$).

There were no significant differences between the action-past-behaviour/inaction-expectations condition and the inaction-past-behaviour/action-expectations condition ($p = .252$, $d = .19$), and there was no interaction between the two factors ($F(1, 299) = 0.03$, $p = .875$, $\eta^2 p = .00$).

The main effects for perceived joy were slightly stronger than those found in Experiment 1, with both showing a weak effect (both $d = .20$, $\eta^2 p = .01$; past-behaviour: $p = .080$, expectations: $p = .077$). There were significant differences in perceived joy in the contrast between the action-past-behaviour/inaction-expectations condition and the inaction-past-behaviour /action-expectations condition ($p = .013$, $d = .41$). Meaning that perceived joy for taking action was highest when past-behaviour was not to act and expectations were to act, and lowest when past-behaviour was to act and expectations were to not act.

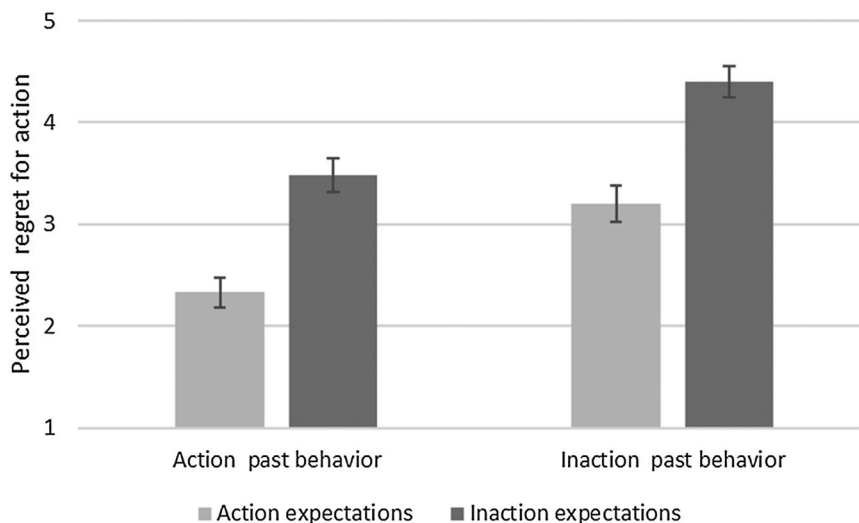
**Figure 3.** Experiment 3 plot for perceived regret (1 = higher perceived regret for inaction; 6 = higher perceived regret for action). Error bars indicate standard error.

Table 9. Experiment 3: ANOVA results.

| | Sum of Squares | df | Mean Square | <i>F</i> | <i>p</i> | $\eta^2 p$ |
|---|----------------|-----|-------------|----------|----------|------------|
| Past behaviour normality | 60.261 | 1 | 60.261 | 30.640 | <.001 | 0.093 |
| Expectations normality | 104.028 | 1 | 104.028 | 52.893 | <.001 | 0.150 |
| Past behaviour normality * Expectations normality | 0.049 | 1 | 0.049 | 0.025 | .875 | 0.000 |
| Residuals | 588.066 | 299 | 1.967 | | | |

Experiment 4: social-norms normality, expectations normality, and past-behaviour normality

Aim and pre-registration

Experiment 4 was meant as a confirmatory pre-registered experiment to test all three normality dimensions in a single paradigm. Experiments 1–3 provided a test of each dimension against either one of the other dimensions, and in Experiment 4 the test would be against both. The experiment was pre-registered on the OSF before data collection began (link: <https://osf.io/fdk57/>).

Method

A total of 403 Americans MTurk participants were recruited online using TurkPrime.com ($M_{\text{age}} = 36.36$, $SD_{\text{age}} = 11.91$; 216 females). Participants that took part in Experiments 2 and 3 were not allowed to participate in the study.

Participants were randomly assigned to one of eight conditions in a $2 \times 2 \times 2$ experimental between-subject design manipulating three factors – social-norms normality (action versus inaction), past behavioural tendency (action versus inaction) and situational expectations (action versus inaction). I adjusted the scenario used in Experiment 3 to contrast expectations normality and past-behaviour normality (based on: Zeelenberg et al., 2002) by adding the manipulation of social-norms used in Experiment 1 (based on: Feldman & Albarracín, 2017). In the scenario, I first manipulated action-inaction social-norms, then past behavioural tendency, and finally expectations for action-inaction.

The scenario was followed by the comprehension questions used in Experiments 1 and 3 for their respective manipulations.

As in Experiments 1 and 3, participants were asked to rate which of the two coaches is more likely to feel regret following a loss and which is more likely to feel joy following a win (1 = *Definitely David for not taking action*; 6 = *Definitely John for taking action*).

Results and discussion

Means, standard deviations for perceived regret are provided in Table 10 and plotted in Figure 4. ANOVA findings are provided in Table 11, and plots and posthoc comparisons are provided in the supplementary (see “Additional findings – Experiment 4”). I found no effects for perceived joy, and these statistical reports were therefore moved to the supplementary.

The three manipulations affected perceived regret for action-inaction. Past-behaviour normality had the largest effect ($F(1, 395) = 128.73$, $p < .001$, $\eta^2 p = .15$; $d = .75$), followed by social-norms normality ($F(1, 395) = 49.84$, $p < .001$, $\eta^2 p = .11$; $d = .63$), and expectation normality ($F(1, 395) = 37.65$, $p < .001$, $\eta^2 p = .05$; $d = .39$). The classic action-effect was weakened by all normality manipulations, yet the results deviated from the predicted pattern of results from Experiments 1–3 in the pre-registered hypothesis. The effect-size patterns from Experiments 1–3 manipulating only two types of normality in each experiment showed social-norms normality to have the strongest effect-size, followed by expectations normality effect-size, and with the weakest effect for past-behaviour normality. I pre-registered this effect-size pattern and expected that it would generalise to an experiment in which the three types are manipulated together. However, the effect-size pattern in Experiment 4 in which I manipulated the three types of normality together showed that the strongest effect-size was for past-behaviour normality, followed by the social-norms normality effect-size, with the weakest effect size for expectations normality.

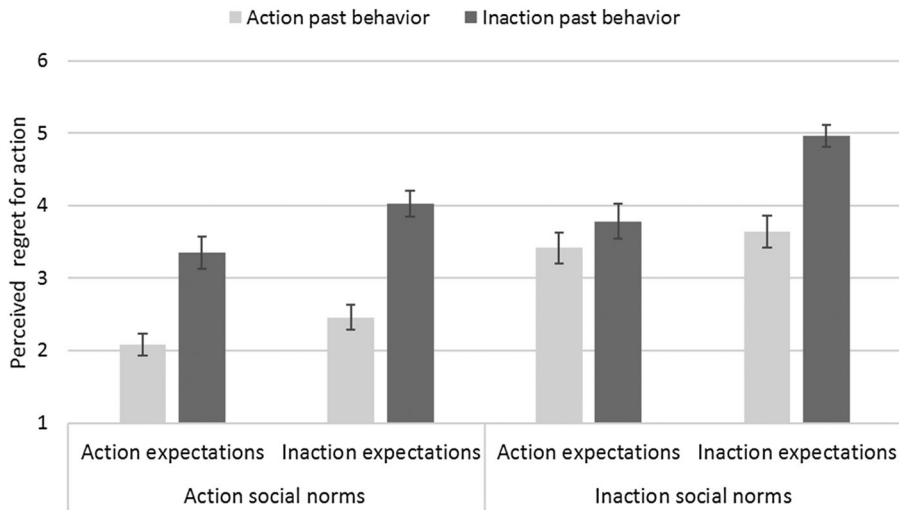
The combination of the three manipulations resulted in the largest effect measured in any one experiment so far (contrast between action-action and inaction-inaction-inaction: $d = 2.75$), with the classic action-effect being reversed to an inaction-effect with higher perceived regret for inaction ($M = 2.08$, $SD = 1.05$, with 3.5 being the midpoint; one sample *t*-test from 3.5: $t(49) = 9.56$, $p < .001$).

There was also a very weak effect for an interaction between social-norms and past-behaviour ($F(1, 395) = 4.32$, $p = .038$, $\eta^2 p = .01$) and an interaction between

Table 10. Experiment 4: perceived regret and joy for taking action. Means and standard deviations.

| Society | Expectations | Past-behaviour | <i>n</i> | Regret <i>M</i> | Regret <i>SD</i> | Joy <i>M</i> | Joy <i>SD</i> |
|----------|--------------|----------------|----------|--------------------|---------------------|-----------------|------------------|
| Action | Action | Action | 50 | 2.08 | 1.05 | 4.12 | 1.65 |
| Action | Action | Inaction | 48 | 3.35 | 1.52 | 4.58 | 1.41 |
| Action | Inaction | Action | 50 | 2.46 | 1.23 | 4.12 | 1.56 |
| Action | Inaction | Inaction | 51 | 4.02 | 1.27 | 4.12 | 1.31 |
| Inaction | Action | Action | 53 | 3.42 | 1.54 | 3.89 | 1.53 |
| Inaction | Action | Inaction | 51 | 3.78 | 1.69 | 4.35 | 1.74 |
| Inaction | Inaction | Action | 50 | 3.64 | 1.54 | 4.36 | 1.41 |
| Inaction | Inaction | Inaction | 50 | 4.96 | 1.05 | 4.28 | 1.60 |

Note: Regret = perceived regret for action; Joy = perceived joy for action.

**Figure 4.** Experiment 4 plot for perceived regret (1 = higher perceived regret for inaction; 6 = higher perceived regret for action). Error bars indicate standard error.**Table 11.** Experiment 4: ANOVA results.

| | Sum of Squares | df | Mean Square | <i>F</i> | <i>p</i> | $\eta^2 p$ |
|--|----------------|-----|-------------|----------|----------|------------|
| Social norms normality | 95.007 | 1 | 95.007 | 49.838 | <.001 | 0.112 |
| Expectations normality | 37.649 | 1 | 37.649 | 19.750 | <.001 | 0.048 |
| Past-behaviour normality | 128.731 | 1 | 128.731 | 67.528 | <.001 | 0.146 |
| Social norms normality * Expectations normality | 0.794 | 1 | 0.794 | 0.416 | 0.519 | 0.001 |
| Social norms normality * Past-behaviour normality | 8.243 | 1 | 8.243 | 4.324 | 0.038 | 0.011 |
| Expectations normality * Past-behaviour normality | 9.617 | 1 | 9.617 | 5.045 | 0.025 | 0.013 |
| Social norms normality * Expectations normality * Past-behaviour normality | 2.786 | 1 | 2.786 | 1.461 | 0.227 | 0.004 |
| Residuals | 752.995 | 395 | 1.906 | | | |

expectations and past-behaviour ($F(1, 395) = 5.05$, $p = .025$, $\eta^2 p = .01$). The interaction between social-norms and expectations and the three-way interaction were not significant ($F < .146$, $p > .227$, $\eta^2 p \sim 0$). I summarise these interaction effects as very weak to practically null, especially given the strong main-effects.

General results: Mini meta-analysis

To provide a summary of the evidence for the three normality categories, I conducted a mini meta-analysis to assess the overall effect sizes (Goh, Hall, & Rosenthal, 2016; Lakens & Etz, 2017; McShane & Böckenholt, 2017). Analyses were conducted using Meta-analysis via Shiny (MAVIS; Hamilton, 2017) using the

Experiments 1–4 effects summarised in Table 12. The weighted effects were as follows: Social-norms normality: $d = .75$ (CI [.59, .89]); Expectations normality: $d = .59$ (CI [.31, .81]); Past-behaviour normality: $d = .65$ (CI [.53, .78]). These can be summarised as comparable consistent moderate to strong effects.

General discussion

In this research I set out to examine the action-effect (Kahneman & Tversky, 1982a) through the lens of norm theory's (Kahneman & Miller, 1986) concept of normality. In four experiments, I tested three identified categories of normality on the action-effect: (1) past-behaviour normality, (2) role/situational expectations normality, and (3) social-norms normality.

In three experiments, I contrasted between pairs of the three normality categories in the context of the action-effect, and in the fourth experiment I examined contrasts between all three categories. The experiments and results are summarised in Table 12.

Summary and contributions

These findings contribute to the literature on the action-effect using norm-theory perspective. First, normality matters for feelings of regret over action and inaction and norm theory can be used to understand biases such as the action-effect. I successfully replicated previous studies on the impact of normality on the action-effect, and the four experiments included nine successful replications. Second, the findings support the three normality categories as being separate and distinguishable, with each type of normality having an impact on feelings of regret and the associated action-effect bias with moderate to strong effects ($d = .51$ to $d = .85$, with one exception $d = .39$), and there were no interactions found. Third, the joint effects of any two types of these three

normality categories or of all three categories combined resulted in very strong effects, much stronger than each of individual effects separately (for two normality categories: $d = 1.56$ – 1.61 ; all three: $d = 2.75$). Lastly, normality affected positive and negative emotions in different ways (for a discussion see: Bostyn & Roets, 2016; Feldman & Albarracín, 2017). In Experiments 1, 3, and 4 I also tested feelings of joy, and found that whereas normality had a strong impact on feelings of regret, the effects of normality for feelings of joy were much weaker and mostly not significant.

The use of the terms “norm” and “normality”

The conclusions drawn from the findings of three distinct normality categories may seem intuitive, yet I believe that these clarifications are crucial because of the ambiguity in norm theory and the many terms that were since used to try and capture normality. Norm theory used the ambiguous word “norm”, which is usually associated with social-norms rather than with what is normal for a person. I built on the terminology by Feldman and Albarracín (2017) referring to past-behaviour normality, expectations normality, and social-norms normality, yet the literature has many other term names for these normality categories. For example, past-behaviour normality was sometimes referred to as intra-personal or personal norm/normality, consistency, behaviour/al routine, behaviour/al standards, ab/normal behaviour, and for the most part all of these were measured in a very similar way examining how the person behaves in comparison to how the person usually behaves. For all normality categories, the common factor is that norm represents some standard or routine to which the evaluated behaviour is compared to assess the extent to which it is an exception (Miller, Turnbull, & McFarland, 1990).

Table 12. Summary of experiments and main findings for perceived regret.

| # | N | Social-norms | Expectations | Past-behaviour | Effect Social | Effect Expectations | Effect Past behaviour | Joint effect size |
|-----|------|--------------|--------------|----------------|---------------|---------------------|-----------------------|-------------------|
| 1 | 231 | 2 | 2 | | .81 | .51 | | 1.61 |
| 2 | 300 | 3 | | 2 | .85 | | .59 | 1.56 |
| 3 | 303 | | 2 | 2 | | .81 | .60 | 1.59 |
| 4 | 403 | 2 | 2 | 2 | .63 | .39 | .75 | 2.75 |
| All | 1237 | | | Mini-meta: | .75 | .59 | .65 | 1.87 |
| | | | | | [.59, .89] | [.31, .81] | [.53, .78] | [1.30, 2.44] |

Note: In the social-norms, expectations, and past-behaviour columns, the values indicate number of conditions, blank indicates this IV was not manipulated in that study. Effect size is Cohen's d for the main-effect between the action and inaction conditions. Joint effect size = the combined effect-size for all manipulations together, contrasting the extreme conditions of all action versus all inaction. Mini-meta = Mini meta-analysis using MAVIS for the overall effect of the three experiments manipulating each normality category (see “General Results” section), values in parentheses indicate 95% confidence intervals.

The use of the term “norm” (from norm theory) in reference to “normality,” which encompasses the more commonly referred to “norms” in their social context meaning may also present a challenge. Some reviews list as many as 17 types of “norm” defined as generalised “rules about behavior” (see Table 1 in Anderson & Dunning, 2014), which may overlap greatly with “normality” describing what is perceived as normal.

The three normality categories represent different aspects of the concept of what is normal. Expectations normality and social-norms normality both represent the social context, whereas past-behaviour normality is mainly about the focal person. Yet, social-norms did not affect expectations despite both representing different levels of normative expectations. Therefore, contextual social expectations and the broader social-norms seem distinct in the way they affect regret over action and inaction. Similarly, there were no person-situation interactions, and the findings suggest that people considered both separately.

The literature would benefit greatly from finding a clear common terminology of normality and norms, for each study to clearly specify which type of normality is investigated, and for the normality research to link with the research on norms.

Why does normality matter?

Norm theory offered an interpretation of why normality matters using cognitive arguments based on heuristics, and in the case of regret normality affects mutability – the ease by which counterfactual alternative realities can be retrieved and assessed. Alternative and complementary accounts have since been suggested. Decision justification theory (Connolly & Zeelenberg, 2002) offered a social account in which normality serves as the means to justify behaviour taken. Using this account, normal behaviours are more easily justifiable to self and others, serving as a socially construed reference point (Reb & Connolly, 2010). These theoretical arguments are especially relevant for outcomes such as regret, blame, and other negative emotions typically affected by the social context. Seta et al. (2001) focused on the human need for consistency, and the anxiety experienced over behaviour that is inconsistent with either self or others. A comparison of these and other accounts for the role of normality is needed and together with these findings would also help better understand the impact of normality for behaviour and emotions in different contexts.

Implications and future directions

The findings support norm theory’s theorising that normality should be taken into account when studying the action-effect. I focused on the action-effect and future research can follow-up to test whether these findings can be extended to other biases associated with norm theory. It is likely that normality would have a similar impact on associated biases (Feldman, Kutscher, & Yay, 2020), such as counterfactual thought (Roese, 1997), the omission-bias (Anderson, 2003; Reb & Connolly, 2010; Ritov & Baron, 1990), the harm-action link (Cushman, Young, & Hauser, 2006). In studying the implications of normality, I have shown that addressing a combination of normality types could lead to much stronger effects than the study of a single type of normality, and so I suggest that to maximise the detection of normality effects researchers can aim to manipulate two or more types of normality in a single scenario or situation (e.g. contrasting action social-norms and action past-behaviour against inaction social-norms and inaction past-behaviour).

The experiments I conducted used a single example of each of the normality categories from the Feldman and Albarracín (2017) typology, yet these normality categories I tested are broad and include many different nuances. For example, social-norms can be either those of approval and sanctions (injunctive) or of perceived standard behaviour of others (descriptive) (Cialdini, 2003; Morris, Hong, Chiu, & Liu, 2015), with a different magnitude of impact over the action-effect (Feldman & Albarracín, 2017), and could therefore interact differently with other types of normality. Expectations normality could be either situational expectations, such as dictated by prior loss/win outcomes (Zeelenberg et al., 2002), or role expectations, such as dictated by the standards of a certain profession (e.g. goalkeepers; Bar-Eli et al., 2007). Future research can explore contrast and joint effects of the more nuanced types of normality.

The experimental design had limitations and so I consider this as a first step in a comprehensive investigation of normality for the action-effect. I focused on two classic action-effect scenarios which ask participants to evaluate action and inaction on a single scale. It is possible that if action and inaction would be evaluated differently if displayed and evaluated separately. It is also possible that the normality categories would have different impact on other

scenarios or situations involving action and inaction, and would be especially different for other emotions (e.g. blame, anxiety) or when action and inaction are not mentioned or are not an important factor. I therefore caution against generalising conclusions to go beyond normality in the action-effect. Future research could build on this research design and findings to extend and broaden the study of normality in decision-making.

In this investigation, I chose to conduct well-controlled lab vignettes experiments rather than real-life experiments. Previous literature has demonstrated the wide generalizability of the action-effect and inaction-effect vignettes, as well as of other manipulations I adapted (see discussion in Zeelenberg et al., 2002), yet I note that the choice of methods limits claims of generalizability to real-life situations, and should therefore be considered as a first step for further investigations to follow examining these factors and effects outside the lab.

Conclusion

I examined the influential norm theory (Kahneman & Miller, 1986) assumptions regarding the widely-known action-effect (Kahneman & Tversky, 1982a) of normality as an important factor in the extent to which actions are regretted compared to inactions under negative outcomes. I contrasted three types of normality – past-behaviour normality, expectations normality, and social-norms normality, to show that these are distinct types of normality and are all important for the action-effect, with the joint effect being the strongest and resulting in a reversal of the action-effect.

Disclosure statement

No potential conflict of interest was reported by the author.

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Contrasting normality: Supplementary materials

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Data and code

All datasets and code are available on the Open Science Framework: <https://osf.io/wmkpe/>

Power analyses

Expectations normality

Used in Experiments 1 and 3.

Our experimental paradigm was based on the Zeelenberg et al. (2002) experiments. In Experiment 2 the reported statistics were:

- Inaction expectations (won last game): $M = 5.2$, $SD = 1.2$, $N = 25$ regret for action
- Action expectations (lost last game): $M = 2.9$, $SD = 1.3$, $N = 25$ regret for action

Which resulted in an effect size d of 1.84, a very strong effect.

Social norms normality

Used in Experiments 1 and 2.

Our experimental paradigm was based on Feldman and Albarracín (in press) experiments. Their Table 4 summarizes the effect for the manipulation used in Experiment 1 as 1.15 and the effect for the manipulation used in Experiment 2 as .91. A very strong effect.

Past behavior normality

As far as we know this is the first time past behavior has been tested in the context of the action-effect. In the introduction we discussed the classic Kahneman and Tversky (1982) hitch-hiker scenario for past behavior normality. The results reported were of 88% (differences from a random 50-50% split), indicating a chi-square of 57.76, when can be converted to a Cohen d of 1.70. Again, a very strong effect.

Overall Experiments 1-3

Due to the very large effects, power analyses required relatively small samples, yet we decided on a minimum of 50 participants per cell. Experiment 1 sample was limited by the availability and participation of undergraduate students in the course credit participant pool.

Experiment 4

This experiment was pre-registered and used Experiments 1-3 effects as reference for power analyses.

Planned sample size: The smallest effect detected for regret in the 3 experiments so far was $d = .51$. For power = .80 alpha of .05 and one-tail contrasts for these effects require a sample size of 49 per condition. With 8 conditions, we aimed for a minimum of 400 participants.

t tests – Means: Difference between two independent means (two groups)

Analysis: A priori: Compute required sample size

| | | | |
|----------------|----------------------------------|---|-----------|
| Input: | Tail(s) | = | One |
| | Effect size d | = | 0.51 |
| | α err prob | = | 0.05 |
| | Power (1- β err prob) | = | 0.80 |
| | Allocation ratio N2/N1 | = | 1 |
| Output: | Noncentrality parameter δ | = | 2.5243712 |
| | Critical t | = | 1.6608814 |
| | Df | = | 96 |
| | Sample size group 1 | = | 49 |
| | Sample size group 2 | = | 49 |
| | Total sample size | = | 98 |
| | Actual power | = | 0.8055635 |

Materials used in the experiments

Experiment 1

Conditions

Action society Action expectations

Imagine a society that is mostly driven by action. Most, if not all, of the people living in this society are very proactive and action-oriented, strongly valuing action over inaction. The norms in this society are for people to keep busy and minimize idle time.

(Questions about the society)

Now try and imagine this action-driven society, and the following situation taking place in that society: In this action-driven society, there are two soccer teams (note: soccer is sometimes called football in some countries, but we are referring to the ball kicking game). John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

Both coaches lost the last game their teams played with a score of 4–0.

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three players with three new players.
- Coach David decides to not take action and to not change his team.

Action society Inaction expectations

Imagine a society that is mostly driven by action. Most, if not all, of the people living in this society are very proactive and action-oriented, strongly valuing action over inaction. The norms in this society are for people to keep busy and minimize idle time.

(Questions about the society)

Now try and imagine this action-driven society, and the following situation taking place in that society: In this action-driven society, there are two soccer teams (note: soccer is sometimes called football in some countries, but we are referring to the ball kicking game). John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

Both coaches won the last game their teams played with a score of 4-0.

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three players with three new players.
- Coach David decides to not take action and to not change his team.

Inaction society Action expectations

Imagine a society that is mostly driven by inaction. Most, if not all, of the people living in this society are very passive and oriented towards inaction, strongly valuing the status-quo over taking action. The norms in this society are for people to refrain from action and maximize idle time.

(Questions about the society)

Now try and imagine this inaction-driven society, and the following situation taking place in that society: In this inaction-driven society, there are two soccer teams (note: soccer is sometimes called

football in some countries, but we are referring to the ball kicking game). John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

Both coaches lost the last game their teams played with a score of 4–0.

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three players with three new players.
- Coach David decides to not take action and to not change his team.

Inaction society Inaction expectations

Imagine a society that is mostly driven by inaction. Most, if not all, of the people living in this society are very passive and oriented towards inaction, strongly valuing the status-quo over taking action. The norms in this society are for people to refrain from action and maximize idle time.

(Questions about the society)

Now try and imagine this inaction-driven society, and the following situation taking place in that society: In this inaction-driven society, there are two soccer teams (note: soccer is sometimes called football in some countries, but we are referring to the ball kicking game). John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

Both coaches won the last game their teams played with a score of 4-0.

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three players with three new players.
- Coach David decides to not take action and to not change his team.

Manipulation check

In such a society which of the following is the more normative behavior?

(1 – Action, 2- inaction, 3 - Neither)

* Note: following the manipulation check there were seven additional questions added after the manipulation about the social norms . Namely, about realism ("How similar is this society to the society in the country where you currently live?"), perceived responsibility for action ("In such a society, how responsible are people for the negative outcomes resulting from their actions") and for inaction ("In such a society, how responsible are people for the negative outcomes resulting from their inactions?"), perceived intent for action ("In such a society, to what extent are actions perceived as deliberate and intentional?") and for inaction ("In such a society, to what extent are inactions perceived as deliberate and intentional?"), and importance of morality ("Based on your intuition, how moral are the people living in such a society?" and "Based on your intuition, how important is it for people to be moral in this society?"). These questions were not analysed, but are provided in the dataset.

Dependent variables

Perceived regret

The teams play according to the coaches' decisions. The results of the match on Sunday is that both teams lost 3–0. Consider that both coaches are members of an action-driven society, and both

coaches were influenced by results of the first game. Who feels greater regret over losing the game, coach John or coach David?

1. Definitely David for not taking action
2. Most likely David for not taking action
3. Probably David for not taking action
4. Probably John for taking action
5. Most likely John for taking action
6. Definitely John for taking action

Perceived joy

Let's examine a different possible result. Suppose that the teams played according to the coaches' decisions, and the results were that both teams won 3-0. Consider that both coaches are members of an action-driven society, and both coaches were influenced by results of the first game. Who feels greater joy over winning the game, coach John or coach David?

1. Definitely David for not taking action
2. Most likely David for not taking action
3. Probably David for not taking action
4. Probably John for taking action
5. Most likely John for taking action
6. Definitely John for taking action

Experiment 2

Conditions

Action norms Action past behavior

Mr. Paul and Mr. George are stock traders who work for A&M Finance. Most, if not all, of the stock traders working for A&M Finance are very action-driven, eager and proactive decision makers, strongly valuing action over inaction. The norms in this company are for people to keep looking for new opportunities for investment with the unofficial motto of "go for it!".

Paul and George are employees favoring action. In past investment decision situations when Paul and George were faced with the options of taking action or not taking action they have shown a clear preference for action.

- Paul has made the decision to invest in company A. During the past year he considered switching to invest stock in company C, but he decided against it. He now finds out that the investment would have been better off by \$1,000,000 if he had switched to the stock of company C.
- George has made the decision to invest in company B. During the past year he switched the investment to stock in company A. He now finds out that the investment would have been better off by \$1,000,000 if he had kept his investment in stock for company B.

Action norms Inaction past behavior

Mr. Paul and Mr. George are stock traders who work for A&M Finance. Most, if not all, of the stock traders working for A&M Finance are very action-driven, eager and proactive decision makers, strongly valuing action over inaction. The norms in this company are for people to keep looking for new opportunities for investment with the unofficial motto of "go for it!".

Paul and George are employees favoring the status-quo. In past investment decision situations when Paul and George were faced with the options of taking action or not taking action they have shown a clear preference for inaction.

- Paul has made the decision to invest in company A. During the past year he considered switching to invest stock in company C, but he decided against it. He now finds out that the investment would have been better off by \$1,000,000 if he had switched to the stock of company C.
- George has made the decision to invest in company B. During the past year he switched the investment to stock in company A. He now finds out that the investment would have been better off by \$1,000,000 if he had kept his investment in stock for company B.

Inaction norms Action past behavior

Mr. Paul and Mr. George are stock traders who work for B&N Finance. Most, if not all, of the stock traders working for B&N Finance are very careful and cautious decision makers, strongly valuing the status-quo over taking action. The norms in this company are for people to not act unless they are certain it is necessary, with the unofficial motto of "if it isn't broken, don't fix it!".

Paul and George are employees favoring action. In past investment decision situations when Paul and George were faced with the options of taking action or not taking action they have shown a clear preference for action.

- Paul has made the decision to invest in company A. During the past year he considered switching to invest stock in company C, but he decided against it. He now finds out that the investment would have been better off by \$1,000,000 if he had switched to the stock of company C.
- George has made the decision to invest in company B. During the past year he switched the investment to stock in company A. He now finds out that the investment would have been better off by \$1,000,000 if he had kept his investment in stock for company B.

Inaction norms Inaction past behavior

Mr. Paul and Mr. George are stock traders who work for B&N Finance. Most, if not all, of the stock traders working for B&N Finance are very careful and cautious decision makers, strongly valuing the status-quo over taking action. The norms in this company are for people to not act unless they are certain it is necessary, with the unofficial motto of "if it isn't broken, don't fix it!".

Paul and George are employees favoring the status-quo. In past investment decision situations when Paul and George were faced with the options of taking action or not taking action they have shown a clear preference for inaction.

- Paul has made the decision to invest in company A. During the past year he considered switching to invest stock in company C, but he decided against it. He now finds out that the investment would have been better off by \$1,000,000 if he had switched to the stock of company C.
- George has made the decision to invest in company B. During the past year he switched the investment to stock in company A. He now finds out that the investment would have been better off by \$1,000,000 if he had kept his investment in stock for company B.

Control norms action past behavior

Mr. Paul and Mr. George are stock traders who work for C&O Finance.

Paul and George are employees favoring action. In past investment decision situations when Paul and George were faced with the options of taking action or not taking action they have shown a clear preference for action.

- Paul has made the decision to invest in company A. During the past year he considered switching to invest stock in company C, but he decided against it. He now finds out that the investment would have been better off by \$1,000,000 if he had switched to the stock of company C.
- George has made the decision to invest in company B. During the past year he switched the investment to stock in company A. He now finds out that the investment would have been better off by \$1,000,000 if he had kept his investment in stock for company B.

Control norms inaction past behavior

Mr. Paul and Mr. George are stock traders who work for C&O Finance.

Paul and George are employees favoring the status-quo. In past investment decision situations when Paul and George were faced with the options of taking action or not taking action they have shown a clear preference for inaction.

- Paul has made the decision to invest in company A. During the past year he considered switching to invest stock in company C, but he decided against it. He now finds out that the investment would have been better off by \$1,000,000 if he had switched to the stock of company C.
- George has made the decision to invest in company B. During the past year he switched the investment to stock in company A. He now finds out that the investment would have been better off by \$1,000,000 if he had kept his investment in stock for company B.

Quiz comprehension questions

Participants were required to answer the comprehension questions correctly in order to proceed to the next page (Qualtrics validation).

What are the social norms in Paul's and George's company?

1. Proactivity (action)
2. Status quo (inaction)
3. It doesn't say

What are Paul and George's past behavioral preference?

1. Proactivity (action)
2. Status quo (inaction)
3. It doesn't say

Paul's final investment decision involved which of the following?

1. Switching investments (action)
2. Not switching investments (inaction)

George's final investment decision involved which of the following?

1. Switching investments (action)
2. Not switching investments (inaction)

At the end, Paul and George both had finally invested in which company?

1. Company A
2. Company B
3. Company C

Manipulation checks

Norms

Whose investment decision is more common in the company?

1. Definitely inaction Paul
2. Most likely inaction Paul
3. Probably inaction Paul
4. Probably action George
5. Most likely action George
6. Definitely action George

Past behavior

Whose investment decision is more in line with past behavior?

1. Definitely inaction Paul
2. Most likely inaction Paul
3. Probably inaction Paul
4. Probably action George
5. Most likely action George
6. Definitely action George

Dependent variables

Regret

Considering the company behavioral norms and Paul and George's personal behavioral tendencies, who feels greater regret over his investment decision?

1. Definitely inaction Paul
2. Most likely inaction Paul
3. Probably inaction Paul
4. Probably action George
5. Most likely action George
6. Definitely action George

Experiment 3

Conditions

Action past behavior Action expectations

John and David both coach soccer teams. John is the coach of BlueBlue, and David is the coach of RedRed. Both John and David are soccer coaches that favor action.

In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for action and making a change.

Both coaches lost the last game their teams played with a score of 4–0. This puts pressure on both to change the line-up (action) to avoid another loss.

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the team line-up or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Action past behavior inaction expectations

John and David both coach soccer teams. John is the coach of BlueBlue, and David is the coach of RedRed. Both John and David are soccer coaches that favor action.

In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for action and making a change.

Both coaches won the last game their teams played with a score of 4-0. This puts pressure on both of them to keep the current line-up (inaction) to repeat another win.

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the team line-up or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Inaction past behavior action expectations

John and David both coach soccer teams. John is the coach of BlueBlue, and David is the coach of RedRed. Both John and David are soccer coaches that favor the status-quo.

In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for inaction and not changing the line-up.

Both coaches lost the last game their teams played with a score of 4–0. This puts pressure on both to change the line-up (action) to avoid another loss.

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the team line-up or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Inaction past behavior inaction expectations

John and David both coach soccer teams. John is the coach of BlueBlue, and David is the coach of RedRed. Both John and David are soccer coaches that favor the status-quo.

In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for inaction and not changing the line-up.

Both coaches won the last game their teams played with a score of 4-0. This puts pressure on both of them to keep the current line-up (inaction) to repeat another win.

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the team line-up or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Quiz comprehension questions

Participants were required to answer the comprehension questions correctly in order to proceed to the next page (Qualtrics validation).

What are John and David's past behavioral preference?

1. Change (action)
2. Status quo (inaction)

What was the outcome of the last game played?

1. They both lost the last game (more pressure to take action)
2. They both won the last game (more pressure to keep the status-quo)

Finally, what did John decide to do for the upcoming game?

1. Change the line-up (action)
2. Keep the same line-up (inaction)

Finally, what did David decide to do for the upcoming game?

1. Change the line-up (action)
2. Keep the same line-up (inaction)

Dependent variables

Regret

Now, imagine the following result: The teams play according to the coaches' decisions. The results of the match on Sunday were that both teams lost 3–0. Consider that both coaches have general action behavioral tendencies, and both coaches were under some pressure for action because of the results of the previous game. Who feels greater regret over losing the game, inaction coach David or action coach John?

1. Definitely David for not taking action
2. Most likely David for not taking action
3. Probably David for not taking action
4. Probably John for taking action
5. Most likely John for taking action
6. Definitely John for taking action

Joy

Let's examine a different possible result. Imagine the following instead... The teams played according to the coaches' decisions. The results of the match were that both teams won 3-0. Consider that both coaches have general action behavioral tendencies, and both coaches were under some pressure for action because of the results of the previous game. Who feels greater joy over winning the game, inaction coach David or action coach John?

1. Definitely David for not taking action
2. Most likely David for not taking action
3. Probably David for not taking action
4. Probably John for taking action
5. Most likely John for taking action
6. Definitely John for taking action

Experiment 4

Pre-registration

The experiment was pre-registered on the OSF before data collection began: <https://osf.io/gaj53/>

Below is a copy-paste from the pre-registration. Hypotheses 1, 3, and 4 were supported. Hypothesis 2 was not supported, and it discussed.

Intro: see Feldman and Albarracín (2017) and initial manuscript draft for a full introduction to the action-effect and normality categories.

Summary of three experiments conducted so far:

Summary of experiments and main findings for perceived regret

| # | N | IV1 | IV2 | Effect IV1 | Effect IV2 | Joint effect |
|---|-----|----------------------|-------------------|------------|------------|--------------|
| 1 | 231 | Behavioral norms (2) | Expectations (2) | .81 | .51 | 1.61 |
| 2 | 300 | Behavioral norms (3) | Past behavior (2) | .85 | .59 | 1.56 |
| 3 | 303 | Past behavior (2) | Expectations (2) | .60 | .81 | 1.59 |

Note. Effect size is Cohen's d for the main-effect between the action and inaction conditions.

Number in parentheses indicates number of conditions.

A. Hypotheses

Description of essential elements

1. The three normality categories (past behavior normality, role/situational expectations normality, and social norms normality) are distinct and will all have unique medium to strong impact on the regret action-effect.
2. Based on experiments #1 to #3 we expect that for regret social norms normality would have the strongest effect followed by expectations normality and finally past behavior normality.
3. The joint effects of any two types of the three normality categories on regret would result in strong effects (in previous experiments: $d = 1.56$ to 1.61).
4. The joint effects of all three normality categories for regret would result in the strongest effect and a complete reversal of the action-effect.

B. Methods

Description of essential elements

Design

List, based on your hypotheses from section A:

1. Independent variables
 - a. Behavioral norms normality: action versus inaction.
 - b. Expectations normality: action versus inaction.
 - c. Social norms normality: action versus inaction.
2. Dependent variables:
 - a. Regret (main DV of interest, based on the action-effect)
 - b. Joy (supplementary DV, weak to very weak effects expected)
3. Third variables acting as covariates or moderators: none.

Planned sample

4. Pre-selection rules: American MTurkers.
5. Planned sample size: The smallest effect detected for regret in the 3 experiments so far was $d = .51$. For power = .80 alpha of .05 and one-tail contrasts for these effects require a sample size of 49 per condition. With 8 conditions, we will run a minimum of 400 participants.

t tests – Means: Difference between two independent means (two groups)

Analysis: A priori: Compute required sample size

| | | |
|----------------|----------------------------------|-------------|
| Input: | Tail(s) | = One |
| | Effect size d | = 0.51 |
| | α err prob | = 0.05 |
| | Power (1- β err prob) | = 0.80 |
| | Allocation ratio N2/N1 | = 1 |
| Output: | Noncentrality parameter δ | = 2.5243712 |
| | Critical t | = 1.6608814 |
| | Df | = 96 |
| | Sample size group 1 | = 49 |
| | Sample size group 2 | = 49 |
| | Total sample size | = 98 |
| | Actual power | = 0.8055635 |

6. No termination rule.

Exclusion criteria

1. We might exclude based on timers. Completing the session (expected ~5min) within less than 2 minutes would serve as an exclusion criteria, but we will check for data quality in such cases.
We will include questions about English comprehension and seriousness in participation.
In any case, we will report results both with and without exclusion of participants and data+code of the full sample before exclusions will be made available to reviewers and readers.

Procedure

2. See attached Qualtrics survey for full procedure and materials. Materials are fixed order display. Randomization is evenly presented (Qualtrics option).

C. Analysis plan

Confirmatory analyses

Describe the analyses that will test each main prediction from the hypotheses section. For *each one*, include:

1. The statistical technique: three-way ANOVA with two-way ANOVAs and t-test contrasts.
2. Regret and joy DVs are single-item, no calculations required.

Recommended elements

Specify contingencies and assumptions, such as:

1. No missing data, imposed by Qualtrics checks.
2. Single items – no reliability criteria needed.
3. DVs: no anticipated data transformations required.

Answer the following final questions:

Has data collection begun for this project?

- No, data collection has not begun

The (estimated) start and end dates for this project are (optional): Soon after pre-registration

Any additional comments before I pre-register this project (optional): None.

Conditions

Action social norms - Action past behavior - Action expectations

Imagine a society that is mostly driven by action. Most, if not all, of the people living in this society are very proactive and action-oriented, strongly valuing action over inaction.

In this action-driven society, there are two soccer teams. John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

Both John and David are soccer coaches that favor action. In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for action and making a change.

Both coaches lost the last game their teams played with a score of 4–0. This puts pressure on both to change the line-up to avoid another loss (action expectations).

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Action social norms - Action past behavior - Inaction expectations

Imagine a society that is mostly driven by action. Most, if not all, of the people living in this society are very proactive and action-oriented, strongly valuing action over inaction.

In this action-driven society, there are two soccer teams. John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

Both John and David are soccer coaches that favor the status-quo. In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for inaction and not changing the line-up.

Both coaches lost the last game their teams played with a score of 4–0. This puts pressure on both to change the line-up to avoid another loss (action expectations).

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Action social norms - Inaction past behavior - Action expectations

Imagine a society that is mostly driven by action. Most, if not all, of the people living in this society are very proactive and action-oriented, strongly valuing action over inaction.

In this action-driven society, there are two soccer teams. John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

Both John and David are soccer coaches that favor action. In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for action and making a change.

Both coaches won the last game their teams played with a score of 4-0. This puts pressure on both of them to keep the current line-up to repeat another win (inaction expectations).

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Action social norms - Inaction past behavior - Inaction expectations

Imagine a society that is mostly driven by action. Most, if not all, of the people living in this society are very proactive and action-oriented, strongly valuing action over inaction.

In this action-driven society, there are two soccer teams. John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

Both John and David are soccer coaches that favor the status-quo. In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for inaction and not changing the line-up.

Both coaches won the last game their teams played with a score of 4-0. This puts pressure on both of them to keep the current line-up to repeat another win (inaction expectations).

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Inaction social norms - Action past behavior - Action expectations

Imagine a society that is mostly driven by inaction. Most, if not all, of the people living in this society are very passive and oriented towards inaction, strongly valuing the status-quo over taking action.

In this inaction-driven society, there are two soccer teams. John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

Both John and David are soccer coaches that favor action. In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for action and making a change.

Both coaches lost the last game their teams played with a score of 4–0. This puts pressure on both to change the line-up to avoid another loss (action expectations).

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Inaction social norms - Action past behavior - Inaction expectations

Imagine a society that is mostly driven by inaction. Most, if not all, of the people living in this society are very passive and oriented towards inaction, strongly valuing the status-quo over taking action.

In this inaction-driven society, there are two soccer teams. John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

Both John and David are soccer coaches that favor the status-quo. In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for inaction and not changing the line-up.

Both coaches lost the last game their teams played with a score of 4–0. This puts pressure on both to change the line-up to avoid another loss (action expectations).

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Inaction social norms - Inaction past behavior - Action expectations

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Both coaches won the last game their teams played with a score of 4-0. This puts pressure on both of them to keep the current line-up to repeat another win (inaction expectations).

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Inaction social norms - Inaction past behavior - Inaction expectations

Imagine a society that is mostly driven by inaction. Most, if not all, of the people living in this society are very passive and oriented towards inaction, strongly valuing the status-quo over taking action.

In this inaction-driven society, there are two soccer teams. John and David both coach a soccer team. John is the coach of BlueBlue, and David is the coach of RedRed.

Both John and David are soccer coaches that favor the status-quo. In past games when John and David were faced with the option of changing the line-up or keeping the same line-up, they have both shown a clear preference for inaction and not changing the line-up.

Both coaches won the last game their teams played with a score of 4-0. This puts pressure on both of them to keep the current line-up to repeat another win (inaction expectations).

On Sunday the teams are going to play again, and both coaches need to make a decision whether to change the playing team or leave it to be the same as the team who played in the last game.

- Coach John decides to take action: He replaces three of the players with three new players.
- Coach David decides to not take action and to not change his team's line-up.

Quiz comprehension questions

What are the social norms in John and David's society?

1. Proactivity (action)
2. Status quo (inaction)

What are John and David's past behavioral preference?

1. Change (action)
2. Status quo (inaction)

What was the outcome of the last game played?

1. They both lost the last game (more pressure to take action)
2. They both won the last game (more pressure to keep the status-quo)

Finally, what did John decide to do for the upcoming game?

1. Change the line-up (action)
2. Keep the same line-up (inaction)

Finally, what did David decide to do for the upcoming game?

1. Change the line-up (action)
2. Keep the same line-up (inaction)

Dependent variables

Regret

Now, imagine the following result: The teams play according to the coaches' decisions. The results of the match on Sunday were that both teams lost 3–0. Consider that both coaches are members of an action-driven society, with general action behavioral tendencies, and both coaches were under some

pressure for action because of the results of the previous game. Who feels greater regret over losing the game, action coach John or inaction coach David?

1. Definitely David for not taking action
2. Most likely David for not taking action
3. Probably David for not taking action
4. Probably John for taking action
5. Most likely John for taking action
6. Definitely John for taking action

Joy

Let's examine a different possible result. Imagine the following instead... The teams played according to the coaches' decisions. The results of the match were that both teams won 3-0. Consider that both coaches are members of an action-driven society, with general action behavioral tendencies, and both coaches were under some pressure for action because of the results of the previous game. Who feels greater joy over winning the game, action coach John or inaction coach David?

1. Definitely David for not taking action
2. Most likely David for not taking action
3. Probably David for not taking action
4. Probably John for taking action
5. Most likely John for taking action
6. Definitely John for taking action

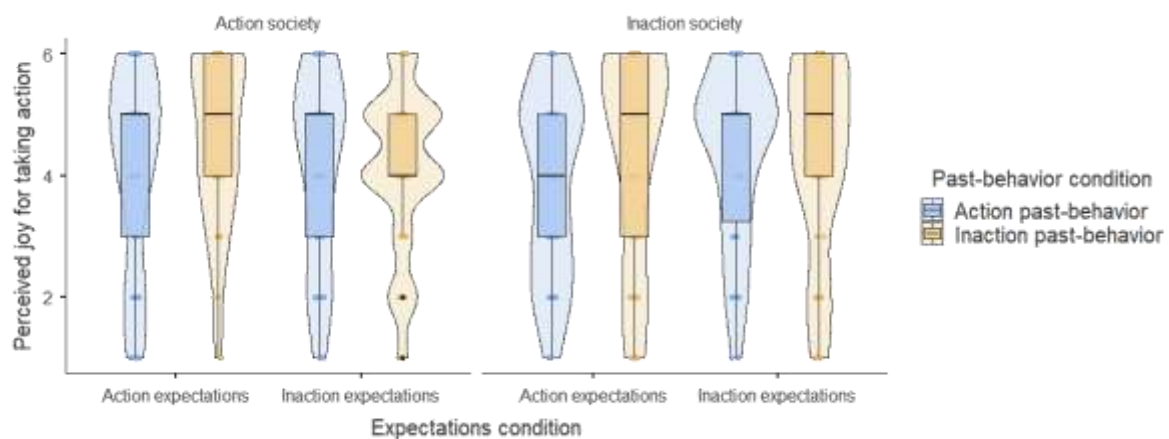
Results for perceived joy

We found no effects for perceived joy. Below are the ANOVA analysis table and descriptives plot.

ANOVA table:

| | Sum of Squares | df | Mean Square | F | p | η^2p |
|--|----------------|-----|-------------|--------|-------|-----------|
| Society condition | 0.0236 | 1 | 0.0236 | 0.0100 | 0.920 | 0.000 |
| Expectations condition | 0.0269 | 1 | 0.0269 | 0.0115 | 0.915 | 0.000 |
| Past-behavior condition | 4.5157 | 1 | 4.5157 | 1.9219 | 0.166 | 0.005 |
| Society condition * Expectations condition | 4.7187 | 1 | 4.7187 | 2.0083 | 0.157 | 0.005 |
| Society condition * Past-behavior condition | 0.0352 | 1 | 0.0352 | 0.0150 | 0.903 | 0.000 |
| Expectations condition * Past-behavior condition | 6.4424 | 1 | 6.4424 | 2.7419 | 0.099 | 0.007 |
| Society condition * Expectations condition * Past-behavior condition | 0.0407 | 1 | 0.0407 | 0.0173 | 0.895 | 0.000 |
| Residuals | 928.0886 | 395 | 2.3496 | | | |

Plot:



Procedure and data disclosures

Data collection

In all experiments, data collection was completed before conducting an analysis of the data.

Please note that Experiment 1 was combined in a data collection with other studies by several researchers as part of a 1-hour participant pool session.

Data exclusions

No participants were excluded.

Conditions reporting

All collected conditions are reported.

Variables reporting

All dependent variables are reported.

Clarification about control condition

In Experiment 1 we used established manipulations from previous literature. The prior outcomes manipulation was adopted from Zeelenberg et al. (2002) and the social norms manipulation was adopted from Feldman and Albarracin (2017) and both had control conditions in those articles. In Experiment 2, the manipulations past-behavior in the classic action-effect scenario has not been previously used in such a way, and we therefore felt it necessary to also assess the baseline effect of past-behavior normality when there was no manipulation of social norms.

Additional findings, tables, and figures

Experiment 1

Post Hoc Tests

Post Hoc Comparisons - Social norms Condition

| Comparison | | Mean Difference | SE | df | t | p _{tukey} |
|------------------------|------------------------|-----------------|-------|---------|--------|--------------------|
| Social norms Condition | Social norms Condition | | | | | |
| Action society | - Inaction society | -1.102 | 0.173 | 227.000 | -6.361 | < .001 |

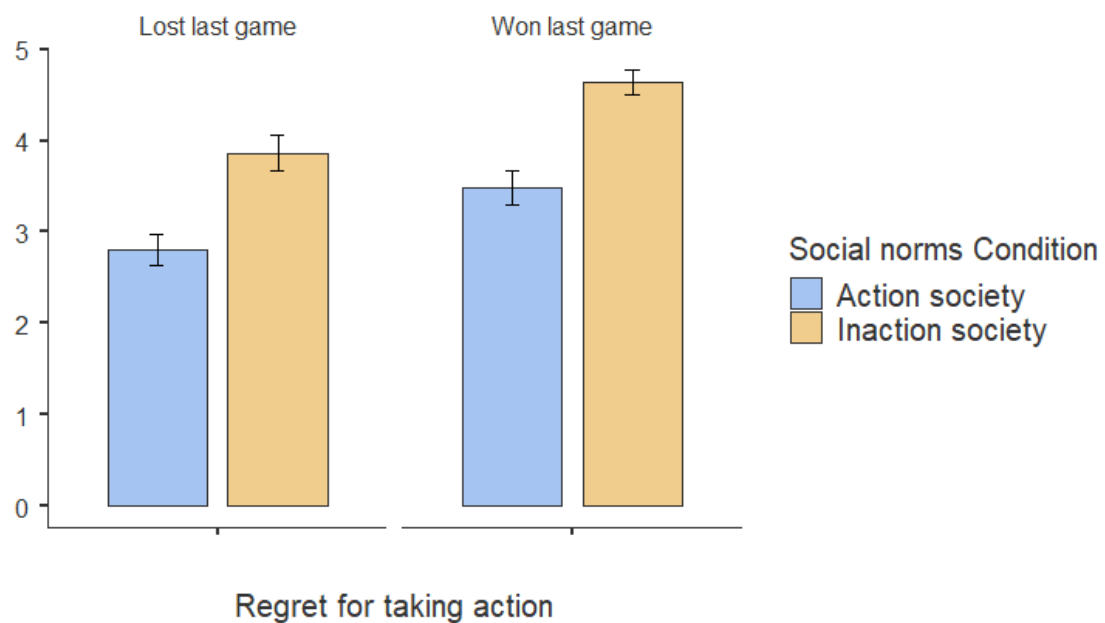
Post Hoc Comparisons - Expectations Condition

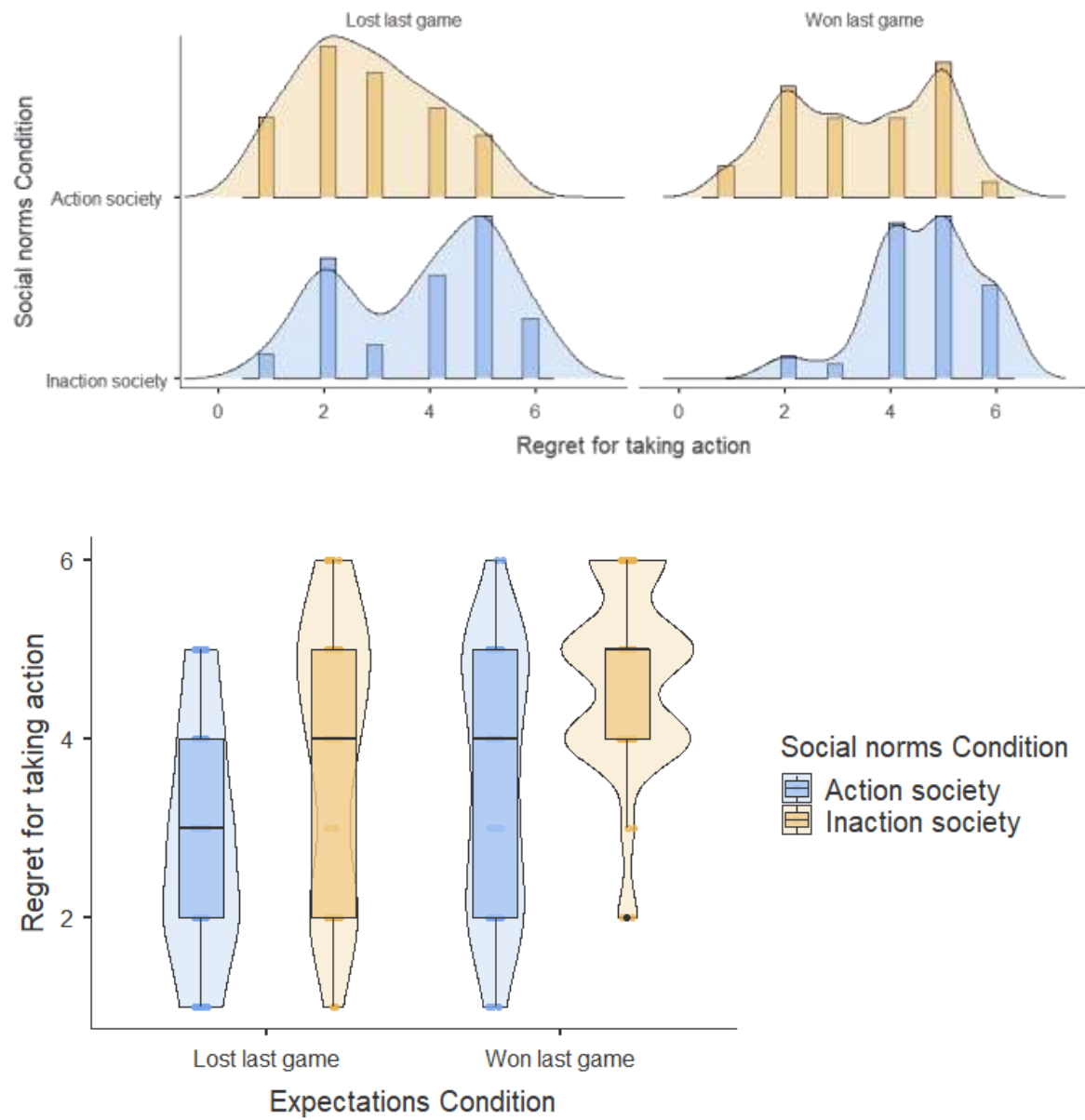
| Comparison | | Mean Difference | SE | df | t | p _{tukey} |
|------------------------|------------------------|-----------------|-------|---------|--------|--------------------|
| Expectations Condition | Expectations Condition | | | | | |
| Lost last game | - Won last game | -0.729 | 0.173 | 227.000 | -4.207 | < .001 |

Post Hoc Comparisons - Social norms Condition * Expectations Condition

| Comparison | | | | | Mean Difference | SE | df | t | p _{tukey} |
|------------------------|------------------------|---|------------------------|------------------------|-----------------|-------|-----|--------|--------------------|
| Social norms Condition | Expectations Condition | | Social norms Condition | Expectations Condition | | | | | |
| Action society | Lost last game | - | Action society | Won last game | -0.684 | 0.247 | 227 | -2.775 | 0.030 |
| | | - | Inaction society | Lost last game | -1.057 | 0.245 | 227 | -4.325 | < .001 |
| | | - | Inaction society | Won last game | -1.831 | 0.246 | 227 | -7.457 | < .001 |
| | Won last game | - | Inaction society | Lost last game | -0.373 | 0.245 | 227 | -1.526 | 0.423 |
| | | - | Inaction society | Won last game | -1.147 | 0.246 | 227 | -4.670 | < .001 |
| | | - | Inaction society | Won last game | -1.147 | 0.246 | 227 | -4.670 | < .001 |
| Inaction society | Lost last game | - | Inaction society | Won last game | -0.774 | 0.243 | 227 | -3.178 | 0.009 |

Figures





Experiment 1 after exclusions

We report the results for experiment 1 when excluding participants failing the manipulation checks. The exclusion had close to no impact on the results, and therefore the main manuscript reports findings of analyses conducted on the full dataset.

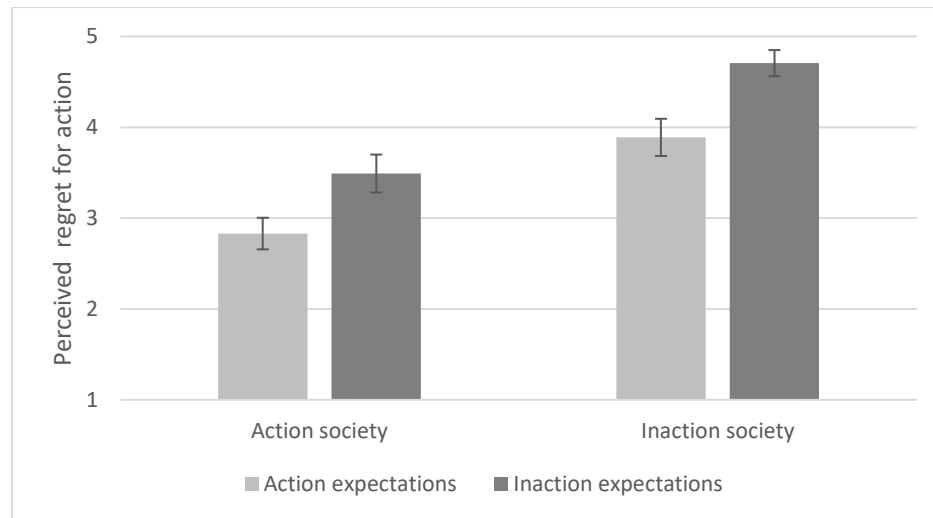


Table 1

*Experiment 1: Means, standard deviations, and Cohen d effects for perceived **regret** (after exclusions)*

| | Action expectations | Inaction expectations | Cohen d | Total |
|------------------|---------------------|-----------------------|-----------|-------------------|
| Action Society | 2.83 (1.27) [53] | 3.49 (1.46) [51] | .49 | 3.15 (1.40) [104] |
| Inaction Society | 3.89 (1.54) [54] | 4.71 (1.03) [51] | .63 | 4.29 (1.37) [105] |
| Cohen d | .76 | .97 | - | .82 |
| Total | 3.36 (1.50) [107] | 4.10 (1.40) [101] | .51 | 3.72 (1.49) [209] |

Note. Parentheses indicate standard deviation. Brackets indicate the number of participants.

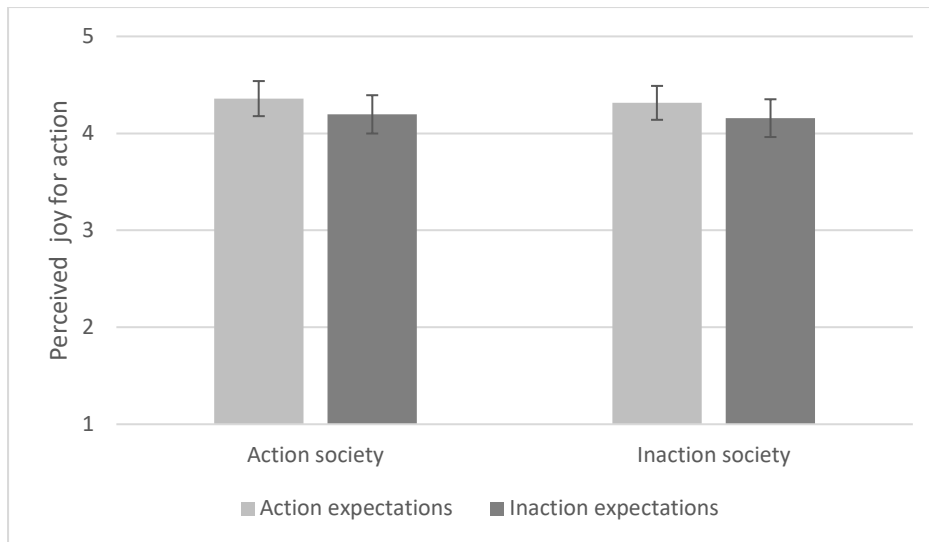


Table 2

*Experiment 1: Means, standard deviations, and Cohen d effects for perceived **joy** (after exclusions)*

| | Action expectations | Inaction expectations | Cohen d | Total |
|------------------|---------------------|-----------------------|-----------|-------------------|
| Action Society | 4.36 (1.32) [53] | 4.20 (1.25) [51] | .13 | 4.28 (1.28) [104] |
| Inaction Society | 4.31 (1.45) [54] | 4.16 (1.39) [51] | .11 | 4.24 (1.42) [105] |
| Cohen d | .03 | .03 | - | .03 |
| Total | 4.34 (1.38) [107] | 4.18 (1.32) [102] | .12 | 4.26 (1.35) [209] |

Note. Parentheses indicate standard deviation. Brackets indicate the number of participants.

Experiment 2

Post hoc comparisons

Post Hoc Comparisons - Social Norms Condition

| Comparison | | Mean Difference | SE | df | t | p _{tukey} |
|------------------------|------------------------|-----------------|-------|---------|--------|--------------------|
| Social Norms Condition | Social Norms Condition | | | | | |
| Action company | - Inaction company | -1.327 | 0.209 | 294.000 | -6.361 | < .001 |
| | - Control company | -0.629 | 0.215 | 294.000 | -2.928 | 0.010 |
| Inaction company | - Control company | 0.697 | 0.217 | 294.000 | 3.208 | 0.004 |

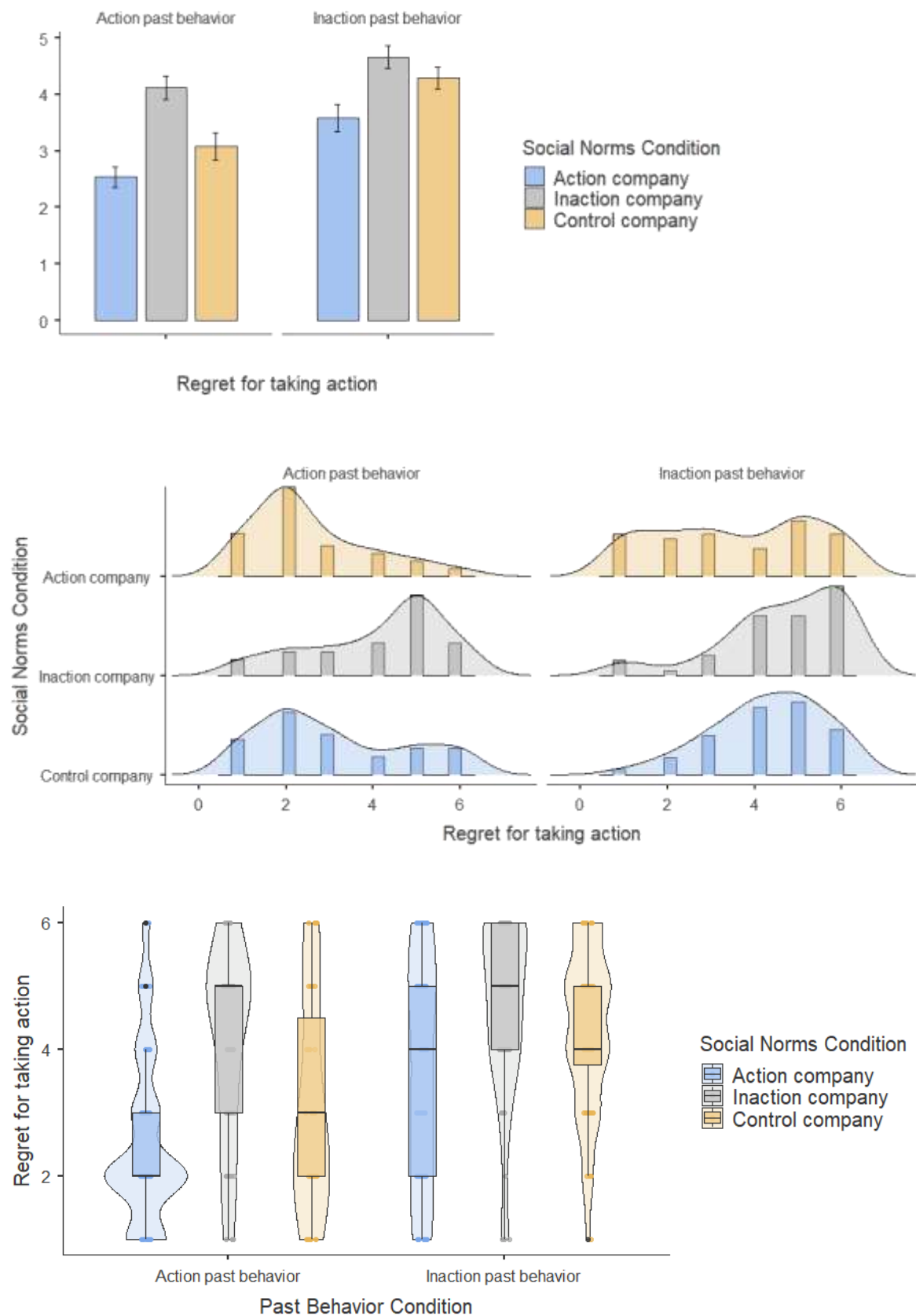
Post Hoc Comparisons - Past Behavior Condition

| Comparison | | Mean Difference | SE | df | t | p _{tukey} |
|-------------------------|--------------------------|-----------------|-------|---------|--------|--------------------|
| Past Behavior Condition | Past Behavior Condition | | | | | |
| Action past behavior | - Inaction past behavior | -0.934 | 0.174 | 294.000 | -5.355 | < .001 |

Post Hoc Comparisons - Social Norms Condition * Past Behavior Condition

| Comparison | | | | | Mean Difference | SE | df | t | p _{Tukey} |
|------------------------|-------------------------|---|------------------------|-------------------------|-----------------|-------|-----|--------|--------------------|
| Social Norms Condition | Past Behavior Condition | | Social Norms Condition | Past Behavior Condition | | | | | |
| Action company | Action past behavior | - | Action company | Inaction past behavior | -1.048 | 0.291 | 294 | -3.596 | 0.005 |
| | | - | Inaction company | Action past behavior | -1.578 | 0.293 | 294 | -5.391 | < .001 |
| | | - | Inaction company | Inaction past behavior | -2.123 | 0.296 | 294 | -7.178 | < .001 |
| | | - | Control company | Action past behavior | -0.548 | 0.301 | 294 | -1.823 | 0.452 |
| | | - | Control company | Inaction past behavior | -1.758 | 0.306 | 294 | -5.746 | < .001 |
| | Inaction past behavior | - | Inaction company | Action past behavior | -0.530 | 0.294 | 294 | -1.803 | 0.465 |
| | | - | Inaction company | Inaction past behavior | -1.075 | 0.297 | 294 | -3.619 | 0.005 |
| | | - | Control company | Action past behavior | 0.500 | 0.302 | 294 | 1.655 | 0.563 |
| | | - | Control company | Inaction past behavior | -0.711 | 0.307 | 294 | -2.312 | 0.193 |
| | | | | | | | | | |
| Inaction company | Action past behavior | - | Inaction company | Inaction past behavior | -0.545 | 0.298 | 294 | -1.825 | 0.451 |
| | | - | Control company | Action past behavior | 1.030 | 0.303 | 294 | 3.397 | 0.010 |
| | | - | Control company | Inaction past behavior | -0.180 | 0.309 | 294 | -0.583 | 0.992 |
| | Inaction past behavior | - | Control company | Action past behavior | 1.575 | 0.306 | 294 | 5.144 | < .001 |
| | | - | Control company | Inaction past behavior | 0.365 | 0.311 | 294 | 1.170 | 0.851 |
| Control company | Action past behavior | - | Control company | Inaction past behavior | -1.210 | 0.316 | 294 | -3.829 | 0.002 |

Figures



Experiment 3

Post hoc

Post Hoc Comparisons - Past behavior Condition

| Comparison | | Mean Difference | SE | df | t | p _{tukey} |
|-------------------------|--------------------------|-----------------|-------|---------|--------|--------------------|
| Past behavior Condition | Past behavior Condition | | | | | |
| Action past behavior | - Inaction past behavior | -0.892 | 0.161 | 299.000 | -5.535 | < .001 |

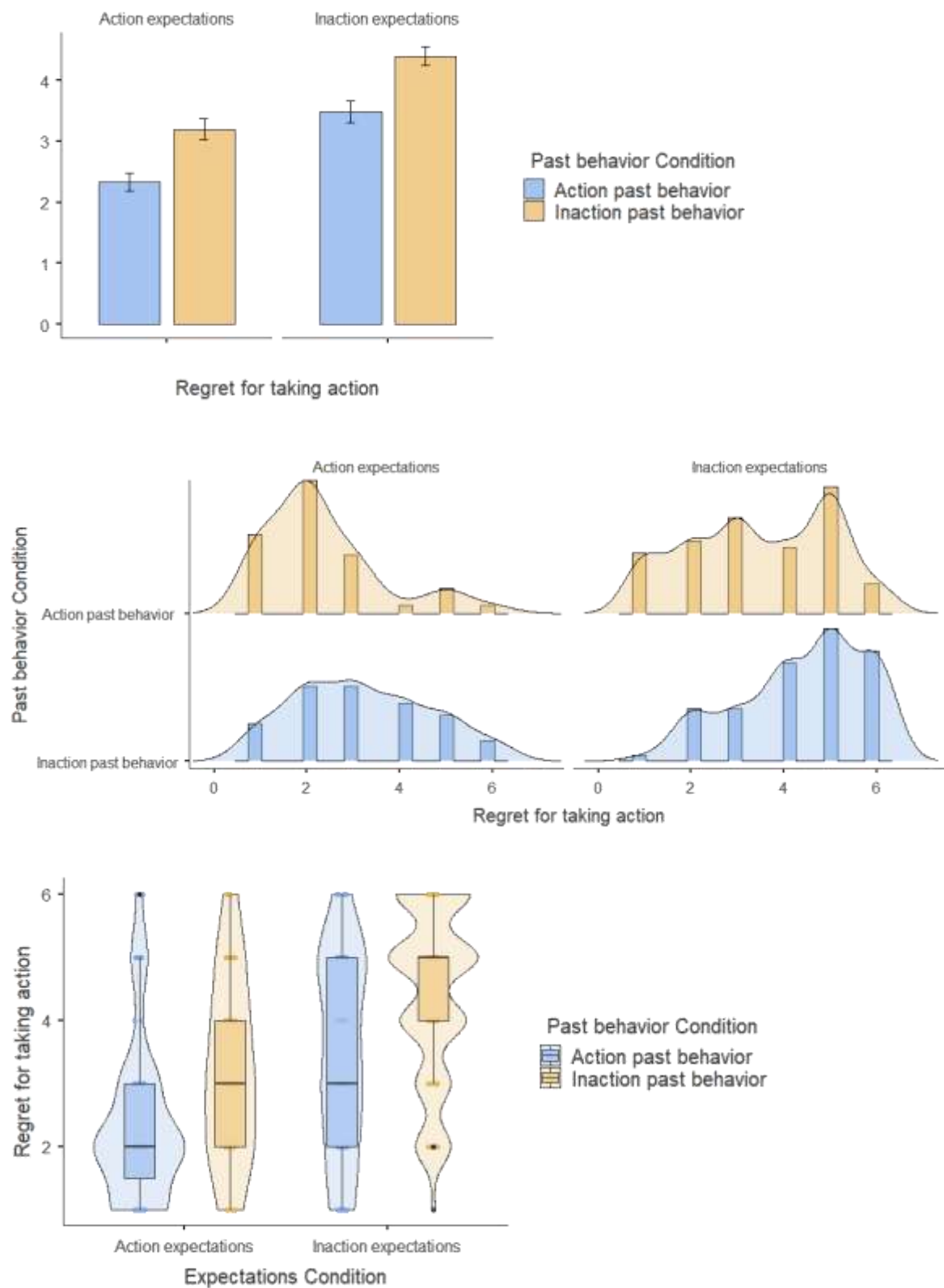
Post Hoc Comparisons - Expectations Condition

| Comparison | | Mean Difference | SE | df | t | p _{tukey} |
|------------------------|-------------------------|-----------------|-------|---------|--------|--------------------|
| Expectations Condition | Expectations Condition | | | | | |
| Action expectations | - Inaction expectations | -1.172 | 0.161 | 299.000 | -7.273 | < .001 |

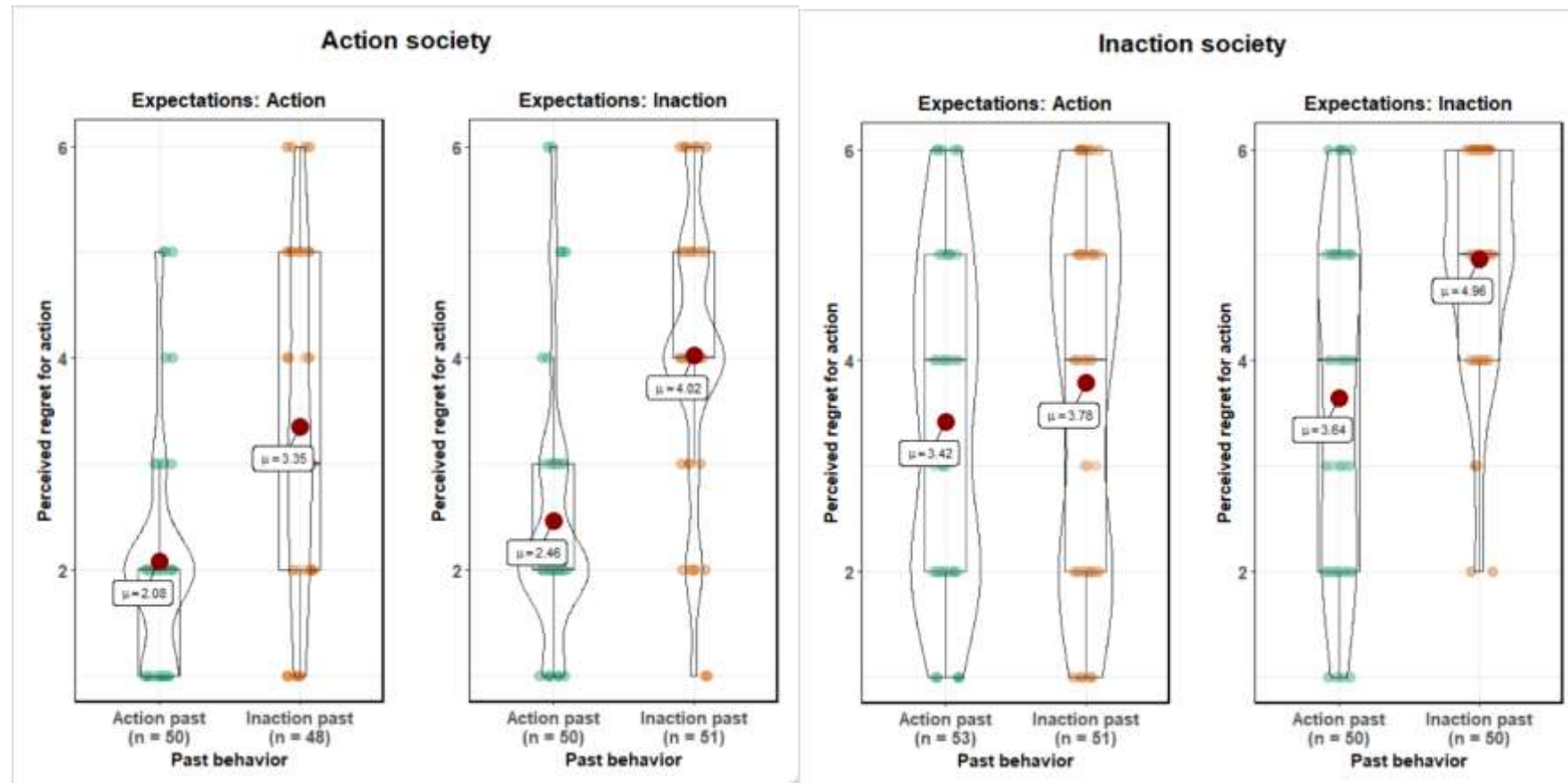
Post Hoc Comparisons - Past behavior Condition * Expectations Condition

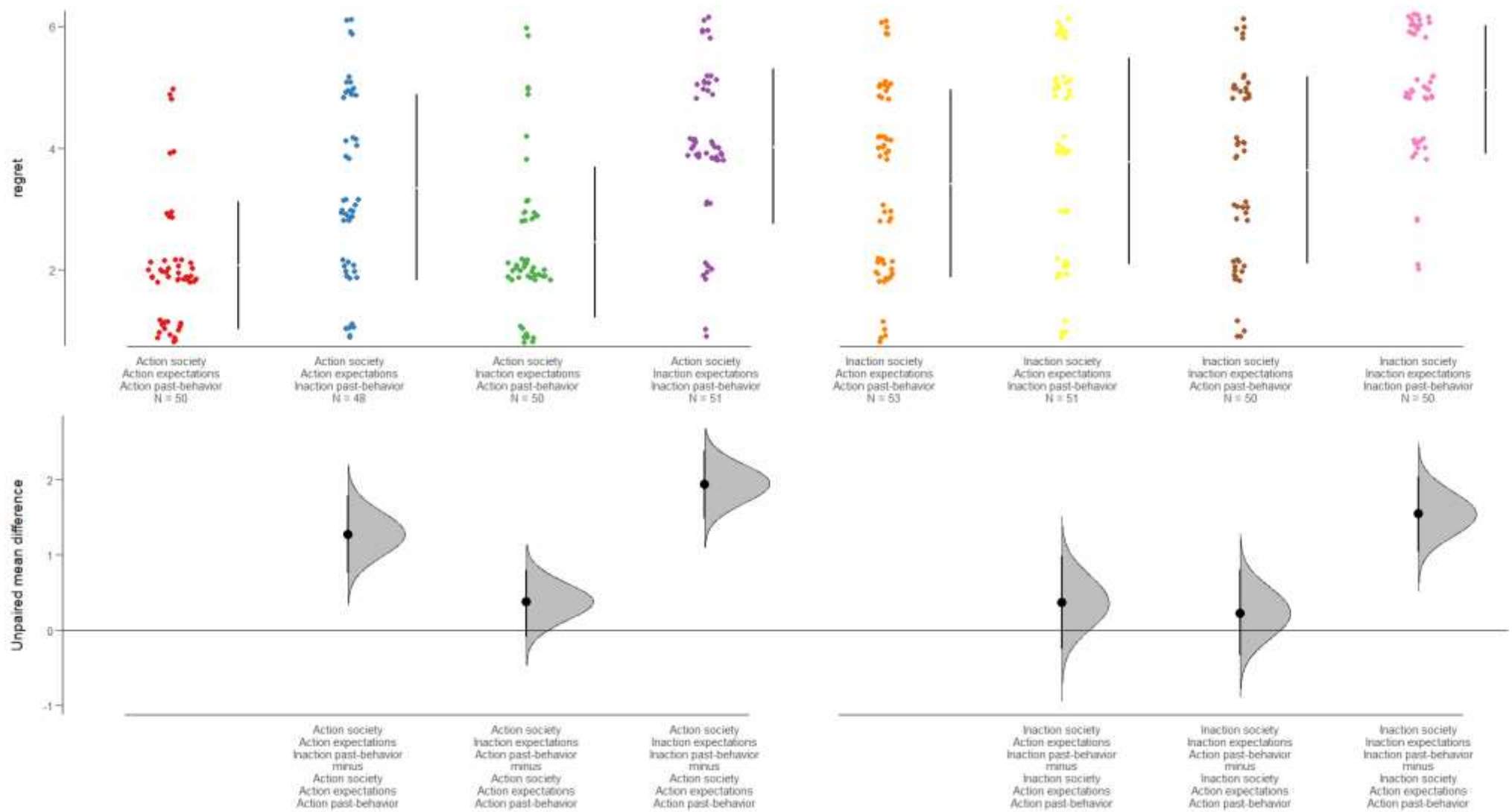
| Comparison | | | | Mean Difference | SE | df | t | p _{tukey} |
|-------------------------|------------------------|--------------------------|------------------------|-----------------|-------|-----|--------|--------------------|
| Past behavior Condition | Expectations Condition | Past behavior Condition | Expectations Condition | | | | | |
| Action past behavior | Action expectations | - Action past behavior | Inaction expectations | -1.147 | 0.229 | 299 | -5.007 | < .001 |
| | | - Inaction past behavior | Action expectations | -0.867 | 0.229 | 299 | -3.784 | 0.001 |
| | | - Inaction past behavior | Inaction expectations | -2.064 | 0.227 | 299 | -9.101 | < .001 |
| | Inaction expectations | - Inaction past behavior | Action expectations | 0.280 | 0.229 | 299 | 1.223 | 0.613 |
| | | - Inaction past behavior | Inaction expectations | -0.917 | 0.227 | 299 | -4.045 | < .001 |
| Inaction past behavior | Action expectations | - Inaction past behavior | Inaction expectations | -1.197 | 0.227 | 299 | -5.280 | < .001 |

Figures



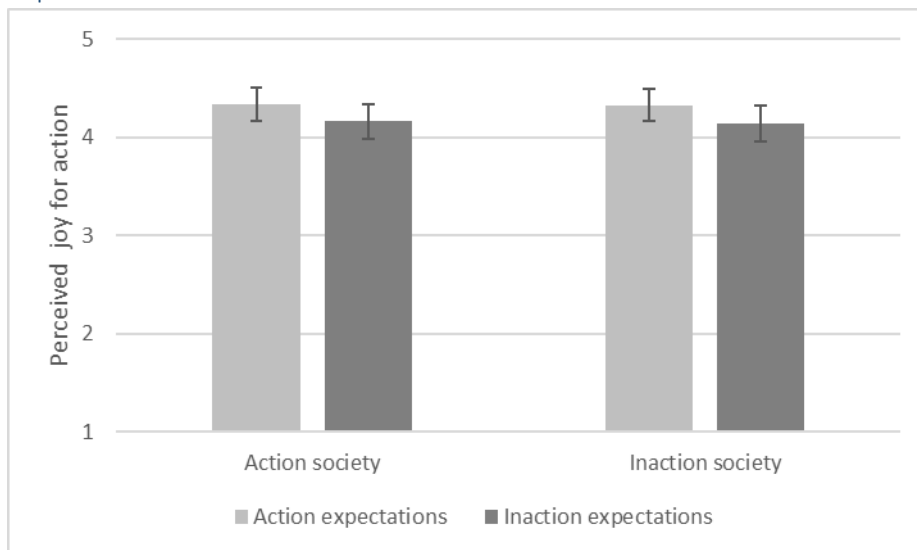
Experiment 4 violin and estimation plots





Joy findings figures

Experiment 1



Experiment 3

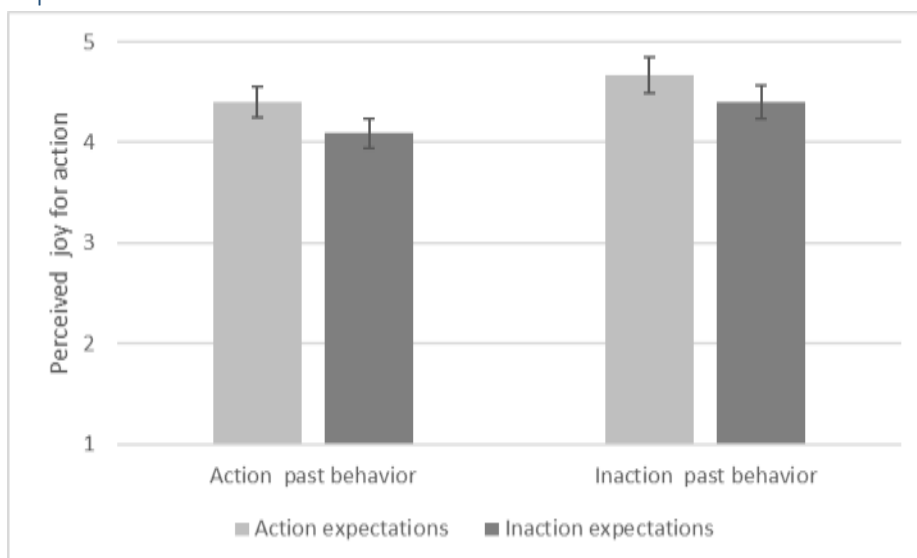
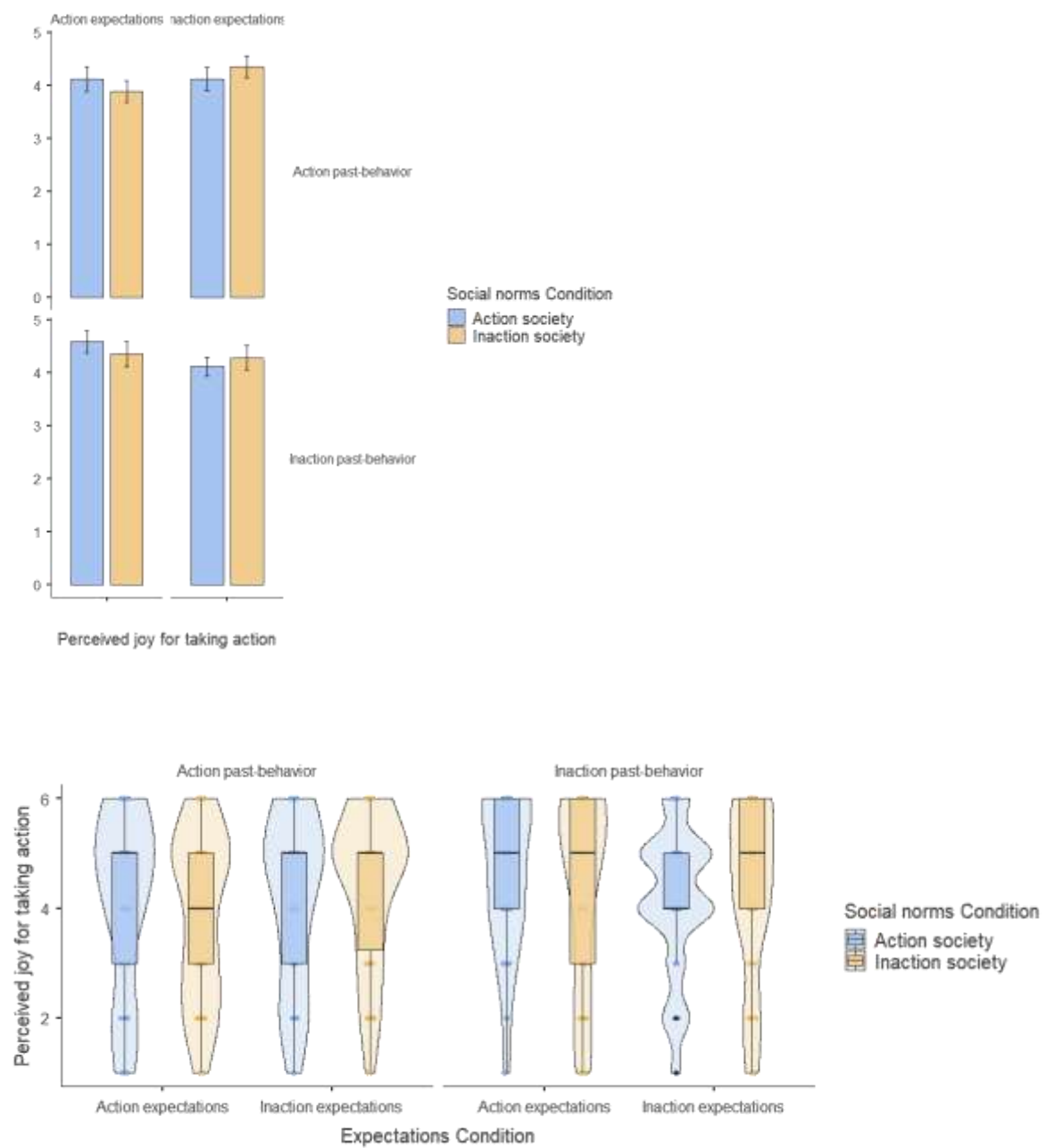


Figure 1. Experiment 3 plot for perceived joy (1 = higher perceived joy for inaction; 6 = higher perceived joy for action). Error bars indicate standard error.

Experiment 4



Gender differences

Review process requested that I add analyses of gender interactions. Across all experiments and all manipulations I found no indication for gender differences.

Experiment 1

| | Sum of Squares | df | Mean Square | F | p | η^2p |
|--|----------------|-----|-------------|--------|--------|-----------|
| Social norms Condition | 68.252 | 1 | 68.252 | 38.712 | < .001 | 0.148 |
| Expectations Condition | 29.272 | 1 | 29.272 | 16.603 | < .001 | 0.069 |
| gender | 0.006 | 1 | 0.006 | 0.003 | 0.954 | 0.000 |
| Social norms Condition * Expectations Condition | 0.169 | 1 | 0.169 | 0.096 | 0.757 | 0.000 |
| Social norms Condition * gender | 0.096 | 1 | 0.096 | 0.055 | 0.816 | 0.000 |
| Expectations Condition * gender | 0.005 | 1 | 0.005 | 0.003 | 0.956 | 0.000 |
| Social norms Condition * Expectations Condition * gender | 0.158 | 1 | 0.158 | 0.090 | 0.765 | 0.000 |
| Residuals | 393.170 | 223 | 1.763 | | | |

Experiment 2

| | Sum of Squares | df | Mean Square | F | p | η^2p |
|---|----------------|-----|-------------|--------|--------|-----------|
| Social Norms Condition | 88.844 | 2 | 44.422 | 19.242 | < .001 | 0.118 |
| Past Behavior Condition | 61.692 | 1 | 61.692 | 26.723 | < .001 | 0.085 |
| gender | 0.072 | 1 | 0.072 | 0.031 | 0.860 | 0.000 |
| Social Norms Condition * Past Behavior Condition | 5.762 | 2 | 2.881 | 1.248 | 0.289 | 0.009 |
| Social Norms Condition * gender | 1.125 | 2 | 0.562 | 0.244 | 0.784 | 0.002 |
| Past Behavior Condition * gender | 0.128 | 1 | 0.128 | 0.055 | 0.814 | 0.000 |
| Social Norms Condition * Past Behavior Condition * gender | 1.378 | 2 | 0.689 | 0.298 | 0.742 | 0.002 |
| Residuals | 664.870 | 288 | 2.309 | | | |

Experiment 3

| | Sum of Squares | df | Mean Square | F | p | η^2p |
|---|----------------|-----|-------------|--------|--------|-----------|
| Past behavior Condition | 59.454 | 1 | 59.454 | 29.891 | < .001 | 0.092 |
| Expectations Condition | 101.775 | 1 | 101.775 | 51.168 | < .001 | 0.148 |
| gender | 0.575 | 1 | 0.575 | 0.289 | 0.591 | 0.001 |
| Past behavior Condition * Expectations Condition | 0.030 | 1 | 0.030 | 0.015 | 0.903 | 0.000 |
| Past behavior Condition * gender | 0.058 | 1 | 0.058 | 0.029 | 0.864 | 0.000 |
| Expectations Condition * gender | 0.654 | 1 | 0.654 | 0.329 | 0.567 | 0.001 |
| Past behavior Condition * Expectations Condition * gender | 0.003 | 1 | 0.003 | 0.002 | 0.968 | 0.000 |
| Residuals | 586.768 | 295 | 1.989 | | | |

Experiment 4

| | Sum of Squares | df | Mean Square | F | p | η^2p |
|--|----------------|-----|-------------|--------|--------|-----------|
| Social norms Condition | 96.759 | 1 | 96.759 | 50.683 | < .001 | 0.116 |
| Expectations Condition | 40.071 | 1 | 40.071 | 20.990 | < .001 | 0.051 |
| Past-behavior Condition | 130.470 | 1 | 130.470 | 68.342 | < .001 | 0.150 |
| gender | 5.592 | 1 | 5.592 | 2.929 | 0.088 | 0.008 |
| Social norms Condition * Expectations Condition | 0.931 | 1 | 0.931 | 0.488 | 0.485 | 0.001 |
| Social norms Condition * Past-behavior Condition | 7.886 | 1 | 7.886 | 4.131 | 0.043 | 0.011 |
| Expectations Condition * Past-behavior Condition | 10.342 | 1 | 10.342 | 5.417 | 0.020 | 0.014 |
| Social norms Condition * gender | 2.717 | 1 | 2.717 | 1.423 | 0.234 | 0.004 |
| Expectations Condition * gender | 1.859 | 1 | 1.859 | 0.974 | 0.324 | 0.003 |
| Past-behavior Condition * gender | 0.176 | 1 | 0.176 | 0.092 | 0.762 | 0.000 |
| Social norms Condition * Expectations Condition * Past-behavior Condition | 3.147 | 1 | 3.147 | 1.648 | 0.200 | 0.004 |
| Social norms Condition * Expectations Condition * gender | 0.081 | 1 | 0.081 | 0.042 | 0.837 | 0.000 |
| Social norms Condition * Past-behavior Condition * gender | 2.909 | 1 | 2.909 | 1.524 | 0.218 | 0.004 |
| Expectations Condition * Past-behavior Condition * gender | 0.278 | 1 | 0.278 | 0.146 | 0.703 | 0.000 |
| Social norms Condition * Expectations Condition * Past-behavior Condition * gender | 0.346 | 1 | 0.346 | 0.181 | 0.670 | 0.000 |
| Residuals | 738.815 | 387 | 1.909 | | | |

Discussion sections moved from main manuscript

I found that (1) all three normality categories had unique impact on the action-effect, with no interactions, (2) all normality categories had consistent medium to large impact on the action-effect ($d = .51$ to $d = .85$, with one exception $d = .39$), (3) the joint effects of the normality categories consistently resulted in very strong effects, much stronger than the individual normality categories on their own (for two normality categories: $d = 1.56$ to 1.61 ; all three: $d = 2.75$), (4) normality had weak to no effect over perceived joy.

[...]

Comparing effect-size of the three normality categories, in Experiment 1 social-norms had a stronger effect than expectations, in Experiment 2 social-norms had stronger effect than past-behavior, and in Experiment 3 expectations had stronger effect than past-behavior. I therefore expected and pre-registered the hypothesis that if manipulated together in a single scenario social-norms would have the strongest effect and past-behavior the weakest effect. However, in Experiment 4 that included the three types of normality, past-behavior emerged as the strongest effect and expectations as the weakest effect. The overall effects as indicated by a mini meta-analysis summarizing the results across the four experiments suggest that the effects for all three normality categories are quite similar, with moderate to strong effects. Therefore, I caution against drawing any conclusions from specific patterns observed in comparing normality categories in one experiment, and instead infer that all three seem important.

[...]

I successfully replicated previous studies on the impact of normality on the action-effect, with Experiments 1, 3, and 4 replicating the effects of expectations normality (Zeelenberg et al., 2002), Experiments 1, 2, and 4 replicating the effects of social-norms normality (Feldman & Albarracín, 2017), and Experiment 2, 3, and 4 replicating the effects of past-behavior normality (Seta et al., 2001).