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Counterfactual Conditionals and Normative Rules

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Abstract

Counterfactual thinking is the consideration of how things could have turned out differently, usually taking the form of counterfactual conditionals. This experiment examined the psychological mechanisms that transform counterfactuals into deontic guidance rules for the future. We examined how counterfactual thinking translates into deontic guidance rules by asking participants to infer these deontic conclusions from the counterfactual premises. Participants were presented with a vignette and a counterfactual conditional, and assigned to either a control condition or a suppression condition in which they were additionally presented with conflicting normative rules. The presence of conflicting norms reduced the likelihood of positive deontic conclusions being endorsed and increased the likelihood of negative deontic conclusions being endorsed. Future intentionality and regret intensity ratings were reduced in the suppression condition. The same conditions that affect normative inference also affect regret and future planning, suggesting similar cognitive mechanisms underlie these processes.

Keywords: conflicting norms**;** counterfactual thinking; deontic introduction; new paradigm; regret

Introduction

All of us have to make many deontic judgments about what we 'should' and 'ought' to do. As Elqayam, Thompson, Wilkinson, Evans and Over (2015) note, when we learn about poverty in Somalia, we naturally infer that we ought to donate to famine relief. Such inferences are made on a daily basis, often about such everyday matters as the type of coffee we 'must' or 'should' buy, or the types of food we 'must not' or 'should not' eat. People readily infer these deontic statements from premises that contain no deontic content. However, very little is known about the psychological processes underlying the inferences.

Recently reasoning research has undergone a shift towards the 'new paradigm' of reasoning (Elqayam & Over, 2013 and see other contributions in this special issue; Evans, 2012). The 'new paradigm' of reasoning rejects binary logic, regards reasoning as strongly related to judgement and decision making, focuses on probabilities and emphasizes pragmatic factors. Such an approach demonstrates how reasoning can be applied to our everyday judgement and decision making. If this is the case, then it is persuasive that reasoning, judgement and decision making may adopt similar psychological processes.

This paper expands upon our previous work within this area (Elqayam et al., 2015), where we examined how we make such deontic judgements from non-deontic content, a process termed *deontic introduction*. The next section presents an overview of our previous research on this area with the use of conflicting norms. Our aim for this paper is to see if we can extend Elqayam et al.'s (2015) findings with counterfactual conditionals and this is why the section after examines previous work on counterfactual thinking to set the scene for our own research. Within this section we refer to literature on the functional basis of counterfactual thinking (e.g., Epstude & Roese, 2008) which provides a rationale for us extending our work on deontic introduction into this domain. The final section before the method section provides an overview of the hypotheses for our current experiment.

Previous Work on Deontic Introduction

Elqayam et al. (2015) examined the process of deontic introduction which entails making deontic inferences from content that contains no deontic material and which is pragmatic or informal type of inference (e.g., Hahn & Oaksford, 2007). Deontic introduction is an inference which is socially contextualised, based on previous beliefs and desires and is probabilistic and defeasible (e.g., Oaksford & Chater, 2007). By defeasible we mean an inference can be withdrawn or suppressed in light of additional information (Elio & Pelletier, 1997).

Elqayam et al. (2015) propose that deontic introduction depends on a chain of inferences which are largely implicit. We begin with a conditional that bears utility (utility conditional) (e.g., If you pull the dog's tail, then it will bite you). When presented with this statement we make a goal valence inference in that a valenced outcome (positive negative or neutral) is implicitly inferred from the description of the outcome (e.g., being bitten is bad). We

then make a causal inference which infers a causal link between the action and outcome (e.g., pulling the dog's tail makes the dog bite). Given we now have the information that being bitten is bad and that pulling to dog's tail makes the dog bite psychological value passes via the causal link from the inferred goal to the action (e.g., pulling the dog's tail is costly) this is known as valence transference. This then feeds into deontic bridging: the valence can bridge into a novel norm expressed by a deontic operator (e.g., you should not pull the dog's tail).

Elqayam et al. (2015) conducted a series of experiments to test various features of the model. They adopted the same core design throughout their studies: they presented a vignette describing a protagonist and a situation with a utility conditional presented underneath. Then participants had to rate the degree to which it follows that the protagonist must, should and may (positive deontic operator) and must not, should not and need not (negative deontic operator) and going to and not going to (inductive conclusion) take the action to bring around the outcome. This experiment examines Elqayam et al.'s defeasibility hypothesis, and so the inference suppression paradigm was adopted (e.g., Stevenson & Over, 1995) in which an additional premise is presented to weaken the strength of the initial argument. Our particular focus is on conflicting norms. Say we are informed that going to a particular holiday region will lead us to having a good holiday. Since this is something we wish to do it is likely that we would choose to go to that location. If we are later informed that the particular holiday region has hunts for endangered species, and we are against such hunting, this causes a conflict between the norm generated by deontic introduction and the pre-existing norm presented separately. This blocks deontic bridging by priming a normative conclusion that is opposite to the one generated by deontic bridging. The result is that participants are less likely to infer positive deontic operators when a conflicting norm is presented compared to when it is not, and more likely to endorse negative deontic operators when a conflicting norm is present compared to when it is not, as found by Elqayam et al. (2015). We wish to examine whether this effect occurs for counterfactual conditionals.

Previous Work on Counterfactual Thinking

Counterfactual thinking can be defined in more than one way, but in the context of this paper, we take it to be considering how things could have turned out differently, for better or worse (see Byrne, 2016 for a review). A student who does not study hard for an exam and then subsequently fails that exam may imagine a world in which they *did* study and they received a good mark. This process may in turn then lead them to the decision that in future they will study for exams. Whilst such a process of counterfactual thinking elicits emotions such as regret (e.g., Wilkinson, Ball, & Alford, 2015; Zeelenberg, 1999) it is said to have functional properties in that it can help people prepare for similar situations in the future (e.g., Epstude & Roese, 2008).

Research on counterfactual thinking has often employed vignette-based paradigms, where participants are presented with a scenario about a protagonist and are required to make a judgement. This research has yielded some consistent results. One is the temporal order effect, in which actions are regretted more in the short term, and inactions more in the long term (e.g., Gilovich & Medvec, 1994). Much related research has been done on counterfactual conditionals. These conditionals, of the form *if p had been q would have been*, presuppose that *p* and *q* are false. In the example of us going on holiday to a particular region, it could be asserted, "If I had gone on holiday to that particular region, then I would have enjoyed my holiday better".

When we are faced with a conflicting norm and the outcome turns out negatively we could argue that the outcome was out of our control since taking the action would mean that we behave in a manner which conflicts with our norms in life. In this instance participants may report that the protagonist may feel less regret when a conflicting norm is present relative to when it is not. Previous work has demonstrated that people are more likely to mutate controllable rather than uncontrollable features in the wake of a negative event (e.g., Girotto, Legrenzi & Rizzo, 1991). If people are more likely to mutate controllable aspects of events, then it may follow that when an outcome is in a protagonist's control participants predict they will feel greater regret in the wake of a negative outcome relative to when it is not as much in their control.

Counterfactual thinking arises from comparing what actually happened to what might have happened. Such comparison, made 'upwards' (it could have been better), or 'downwards' (it could have been worse), help us plan for the future (e.g., Roese, 1994; Epstude & Roese, 2008). We propose that these future plans are mediated by normative rule generation. For example, faced with a disappointing exam result, a student might think she could have done better had she not been hung over. This in turn leads to the creation of a normative rule, 'I should not drink on an exam's eve'. In the psychology of reasoning, this process is called 'deontic introduction' (Elqayam et al., 2015). Our goal is to study the psychological mechanisms governing this transition from counterfactual thinking to deontic rule, and its effect on future planning

Hypotheses

This experiment aimed to extend that of Elqayam et al. (2015) by adopting counterfactual conditionals, rather than indicative conditionals, to examine the effect of conflicting norms. Indicative conditionals are of the form 'If p than q', linking an antecedent p to a consequent q. Please see below an example of a set of stimuli for one of the scenarios that participants had to reason about. The predictions were presented with reference to the stimuli.

Martin has a new girlfriend, Gabrielle. He is keen to impress her by cooking a meal and is at the supermarket looking at different oils since he is making an Italian dish. Martin can buy a special olive oil produced in Fontignani. He opts for the cheaper oil and goes home. After he has cooked the meal and serves up he finds that the pasta is a bit greasy. He says to his girlfriend:

If I had opted for the Fontignani olive oil, then our pasta dish would have tasted better. (control condition)

However, the Fontignani olive oil is produced using intensive farming practices. If Martin uses the Fontignani oil, then he will be contributing to environmental degradation of the area (additional information for suppression condition)

There are a number of predictions we have: (1) that conflicting norms will suppress deontic introduction for counterfactual conditionals in the same manner that they do for indicative conditionals. With a conflicting norm present, conclusions with positive deontic operators will be less likely to be rated and conclusions with negative deontic operators more likely to be rated relative to no conflicting norm being present. In the example above, (2) Martin will be viewed as less inclined to use Fontignani oil if there is a conflicting norm present, e.g. a wish to avoid environmental degradation. When participants are asked how likely the protagonist is to take the action in the future, they will rate it as less likely than when a conflicting norm is absent, and (3) the participants will predict the protagonist will feel less regret intensity in the conflicting norm condition relative to the control condition. The reason for this is that they would have needed to take an action that conflicted with a norm (e.g., contribute to environmental degradation) to bring around the desirable outcome.

Both the first and second hypotheses derive out of the work of Elqayam et al. who found that conflicting norms defeated deontic introduction and the third hypothesis relating to regret emerges from the previous literature on counterfactual thinking which indicates that participants are more likely to mutate controllable relative to uncontrollable aspects that led to an unfortunate outcome (e.g., Girotto et al., 1991). It therefore follows that if participants are more likely to mutate controllable aspects then these controllable aspects may in turn lead to the inference that the protagonist will feel greater regret when the situation was in their control and no conflicting norm was present then when the conflicting norm may have taken the outcome somewhat out of their control.

Method

Participants

Seventy-eight participants completed the experiment and were recruited via Crowdflower a crowd sourcing platform enabling members of the public to participate in research for a small financial reimbursement. There were 40 females and 37 males with 1 participant not disclosing gender. Participants age range was 21-75 years. Twenty participants stated Canada was their country of residence, 27 UK, 29 USA and 1 Australia. One participant did not disclose a country of residence. If participants reported a diagnosis of dyslexia, if English was not their first language or they failed to answer the attention checking question correctly their data were excluded from analysis. This left us with 62 participants.

Experimental Design, Materials and Procedure

A mixed design was adopted. Participants were either randomly assigned to the control condition, in which they were just presented with the vignette and conditional statement or the suppression condition, in which participants were additionally presented with a conflicting norm. Participants had to then complete three tasks which are explained below: (1) a deontic rating task, (2) an intentionality question and (3) a regret intensity question. The independent variables were whether participants were in the condition to which participants were assigned (control or suppression) and the deontic operators (must, should, may and must not, should not and need not). The dependent variables were conclusion rating of the deontic operators from 1 = definitely does not follow to 7 = definitely follows, future intentionality rating from 1 = not at all likely to 7 = highly likely and regret intensity rating from 1 = low regret to 7 = high regret. Each task was presented on a separate page. There was a practice item at the top of each page to get participants used to each task. Participants reasoned about five vignettes. Materials were modified from Elqayam et al. (2015) Experiment 3.

The *deontic rating task* asked participants to rate the degree to which it followed that the protagonist must, must not, should, may and need not take the action in the vignette. Participants were required to state for each deontic operator whether they thought it definitely does not follow, follows very weakly, follows weakly, follows to some degree, follows strongly or follows very strongly. Participants completed a *regret rating task*. They had to rate the degree of regret they thought the protagonist would feel on a 7-point scale from 1 = low regret to 7 = a high regret. The *future intentionality task* asked participants to state the degree to which they thought that the protagonist would be likely to take the action in the future. Again, participants rated this on a 7-point scale from 1 = not at all likely to 7 = highly likely.

Results

Deontic Introduction

As can be seen in Table 1, all positive deontic operators receive higher ratings in the control condition relative to the suppression condition and all negative operators receive higher ratings in the suppression condition relative to the control condition. A 2 (condition: suppression or control) x 6 (operator: must, must-not, should, should-not, may and need-not) ANOVA was conducted and found an operator x

condition interaction $F(5, 255) = 12.63$, $MSE = 2.65$, $p < .01$, $\eta_p^2 = .20$. A significant main effect of operator was observed using a Greenhouse-Geisser correction $F(2.73, 139.25) = 45.50$, $MSE = 2.65$, $p < .05$, $\eta_p^2 = .47$ but no main effect of condition $F(1, 51) = 1.04$, $MSE = 2.56$ $p = .31$, $\eta_p^2 = .02$.

Table 1: Mean (and standard deviation) ratings for each deontic operator as a function of condition

Operator	Control	Suppression
Must	4.31 (1.62)	2.96 (1.15)
Should	5.55 (0.92)	3.80 (0.93)
May	5.37 (1.21)	4.93 (1.19)
Must not	1.96 (1.28)	2.76 (1.38)
Should not	2.06 (1.35)	3.09 (1.24)
Need not	2.93 (1.24)	3.54 (1.62)

In order to unpack the operator x condition interaction, we conducted six independent samples t-tests for each operator separately. This was found to be significant for the operators must, should and should not with a $p < .008$ with the adoption of a Bonferroni correction but not for the must not $p = .03$, may $p = .19$ and need-not $p = .13$. These fit with our first hypothesis that conflicting norms will lead to lower ratings for positive deontic operators compared to the control condition with the reverse the case for negative deontic operators.

Future Intentionality and Regret Ratings

We then examined the future intentionality ratings comparing the control condition to the suppression condition. We compared mean likelihood ratings across the scenarios for the control and suppression conditions and found future intention ratings were higher in the control condition (M = 5.95, SD = 0.49) compared to the suppression condition (M = 4.48, SD = 0.96) a finding which reached significance when conducting an independent samples t-test $t(51) = 6.80$ $p < .01$. This supports our hypothesis that future intentionality will be weakened in the suppression condition.

Our final analysis considered the reported regret intensity that participants thought the protagonist would feel. It was found that participants thought the protagonists in the control condition would experience greater regret intensity (M = 5.61, SD = 0.66) comparative to the suppression condition (M = 4.44, SD = 1.09) a finding which was significant when undertaking an independent samples t-test $t(51) = 4.58$, $p < .01$. This supports our hypothesis that the level of regret intensity the participant thinks the protagonist will feel is less in the suppression condition compared to the control condition.

General Discussion

The aim of this experiment was to examine the process of deontic introduction for counterfactual conditionals rather than indicative conditionals. We examined the defeasibility hypothesis adopting conflicting norms to block the deontic bridging stage of deontic introduction. We proposed three hypotheses at the start of our paper (1) that conflicting norms will suppress deontic introduction in the context of counterfactual conditionals, as they do with indicative conditionals, (2) when a conflicting norm is present participants will rate the protagonist's intention to take the action in the future as lower than when no conflicting norm is present and (3) when a conflicting norm is present regret intensity for the outcome will be rated as lower compared to when no conflicting norm is present.

Support was found for the first hypothesis with positive deontic operators rated as lower in the conflicting norms condition relative to the control condition with the reverse pattern occurring for negative deontic operators. This finding supports the defeasibility hypothesis of Elqayam et al. (2015) and extends to findings of Elqayam et al. to counterfactual conditionals. We propose the same explanation for these findings that Elqayam et al. offer in their paper. Deontic bridging is not able to occur due to a conflict between the pre-existing norm and the invited normative conclusion (generated by deontic introduction).

When it came to our item analysis for each of the operators we observed significant effects for must, should and should not. Taking into consideration the marginal significant effect of must not we note that the significant differences lie in those operators that express obligations and forbidding but not permissions. This finding suggests that perhaps the role of counterfactual thinking is to direct future action, making it functional (e.g., Epstude & Roese, 2008). In this respect, obligations and forbidding are more powerful than permissions, and this could provide an explanation for the pattern of results we observed.

Our second hypothesis was that, for future intentionality ratings, participants would predict the protagonist would be less likely to take the action when a conflicting norm was present compared to when it was not. This is what we found. We propose that this result occurs because a conflicting norm prevents deontic bridging. Such a finding supports our prediction that deontic introduction can be used to direct future actions as a result of the presence of counterfactuals. This is in line with the notion of counterfactual thinking is functional (e.g., Epstude & Roese, 2008).

Our third hypothesis was participants would report the protagonist feeling less regret when a conflicting norm was present compared to when it was not. This hypothesis was supported. We propose that this finding may occur for one of two reasons. The first is that the conflicting norm serves to distance the protagonist from the regretted incident by providing a justification or rationale for them not taking the action. In the case of Martin and the Fontignani olive oil, that justification would be the conflict between having the better meal and the fact that he does not want to contribute to environmental degradation. If this process is occurring, the decision could be seen as self-enhancing allowing one to distance oneself from the regretted outcome (e.g., Feeney,

Gardiner, Johnston, Jones & McEvoy, 2005). A second reason this effect may occur could be linked to the controllability of the outcome. If we take away the conflicting norm in the case of Martin and the Fontignani olive oil the outcome is entirely within Martin's hands: he did not select the correct olive oil for the dish resulting in the dish not being as nice. However, when we add a conflicting norm, that outcome becomes less controllable, since he does not want to behave in a manner that conflicts with his normative framework. We propose that perhaps less regret is predicted in the suppression condition because participants view the outcome as less in control of the protagonist. Girotto et al. (1991) found that participants prefer to mutate controllable relative to uncontrollable events that lead to a negative outcome. We propose that, when a conflicting norm is presented, this makes taking the action to bring about the desired outcome less "controllable" in a normative sense: it becomes less permissible or even forbidden. Since people are more likely to mutate controllable than uncontrollable events that led to a negative outcome, it seems intuitive that greater regret intensity will be predicted for the control condition, where the outcome is within the protagonist's control, than in the suppression condition, in which the conflicting norm serves to block the action, making it uncontrollable in the normative sense. Both hypotheses are possible but the controllability one may be stronger since when it comes to distancing oneself from the outcome controllability may act as a moderator. A future avenue of research could use a controllability manipulation (controllable versus uncontrollable outcome) to examine what effect this direct manipulation has on deontic introduction.

A final suggestion for the result lies in the fact that participants have to make a comparison when presented with a conflicting norm. For Martin it is the choice between using the other oil and the meal not being as tasty to using the Fontignani oil and contributing to environmental degradation. It is possible that in these cases preference construction occurs on the spot.

The fact that conflicting norms demonstrate such consistent results when also accounting for Elqayam et al.'s (2015) findings strongly indicates that people are unwilling to go against their normative framework. Although we did not test it directly in our study one proposal is that whilst people will generally not go against their normative framework for small instances (e.g., having a nice meal) they *may* do so when the outcome generates sufficient benefit. For example, we may be told as children that it is wrong to lie, and we must tell the truth, and we may hold that norm. However, if we are placed in a situation in which lying could garner a benefit and especially a moral benefit (e.g., saving a life) then it may be the case that we act against our normative framework in this instance.

These findings have extended those of Elqayam et al. (2015) through demonstrating that their proposed model for deontic introduction can be applied to counterfactual conditionals. This is an important theoretical development since it indicates that similar cognitive processes are at work when reasoning about counterfactual to indicative conditionals. We propose that an avenue for future research could be to test different components of the model of Elqayam et al. to see whether they are applicable for counterfactual counterfactuals in the same manner as they are for indicative conditionals. Elqayam et al.'s work has demonstrated that factors such as utility and probability, which are deeply rooted in the new paradigm, have an impact on deontic introduction for indicative conditionals. We propose that such effects may also occur when counterfactual conditionals are used.

Research on deontic introduction has begun by adopting a vignette-based paradigm like many areas of reasoning research. One challenge of that paradigm though is seeing the degree to which the model can apply to everyday life. We propose an interesting extension would entail asking participants to recall an instance of real life regret, to consider a counterfactual conditional, and then to complete the deontic rating task. Through adopting this approach, we hope to learn how deontic introduction can be applied to real life regrets, and whether the same experimental manipulations, such as conflicting norms, demonstrate the same suppression effects as they do in a vignette-based paradigm, where the participant is reasoning about an unknown protagonist.

From a methodological perspective we believe it would be interesting to examine the cognitive processes participants adopt directly via the adoption of think-aloud protocols. This is a process-tracing technique that requires participants to think aloud whilst working through a problem in order for the researcher to gain insight into participants' thought processes (see Ericsson & Simon, 1993). Wilkinson, Ball and Cooper (2010) have utilised think aloud protocols using counterfactual vignettes about mental states to good effect. Stenning and van Lambalgen (2008) show that experimental data can be enriched by the use of think aloud protocols, revealing how participants understand the task, and the trajectory of their reasoning processes. By adopting think aloud protocols whilst asking participants to complete the deontic rating task, future intentionality and regret questions could provide insights into their cognitive processes and potentially add further weight to the model of Elqayam et al. (2015). It would enable participants to state how they deal with the presence of a conflicting norm within their reasoning. This would enable the test of some of the predictions for the findings made within this section.

This experiment has extended one of the findings of Elqayam et al. (2015), demonstrating that deontic introduction in the context of conflicting norms is not only affected by indicative conditionals but also by counterfactual conditionals. This is an important finding for the new paradigm of reasoning (e.g., Evans, 2012; Manktelow, Over, & Elqayam, 2011; Over, 2009) with subjective degrees of belief at its heart and social pragmatics and subjective psychological value having a significant role

to play (Elqayam & Over, 2013). We believe that our research adds to this field by showing how counterfactual conditionals can give rise to new deontic norms. It supports the conclusion that, whilst our counterfactual thinking may cause us pain, it is truly functional (e.g., Epstude & Roese, 2008). As Elqayam et al. (2015) noted, humans are quite ready to infer an 'ought' from an 'is' (see also Hume, 2000/1739-1740). Our findings indicate that humans are also often keen to infer an 'ought' from a 'would have been'.

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