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Conditional Promises and Threats – Cognition and Emotion

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Abstract

Conditional promises and threats are speech acts that can be used to manipulate the behavior of other persons. Although reasoning studies have been able to reveal some peculiarities of these concepts, the *explanation* has remained fragmentary. To fill in this gap, a theoretical analysis of conditional inducements is proposed, which integrates cognitive as well as emotional aspects. An experiment – focussing on linguistic, pragmatic, emotional, and deontic consequences – corroborates the analysis and shows that persons have a clear understanding of conditional inducements.

Introduction

Conditional promises and threats are speech acts (Searle, 1971) uttered by a person to manipulate an addressee's behavior by setting up consequences of his behavior (cf. Conison, 1997; von Wright, 1962). Walking home from school, Henry may make the following proposal to his classmate Bob:

(1) "If you lend me your bike,
     then I will help you with your homework".

Bob can infer from this statement that Henry would like to borrow his bike, and that Henry believes that he (Bob) needs Henry's help.

Research on human reasoning usually focusses on the *inferential* use of conditional promises/threats within the normative framework of propositional logic: Which inferences do people draw from conditional arguments? Suppose, (2) Bob *lends* Henry his bike. What follows then from (1) and (2)? Will Henry help Bob? – Although we cannot know for sure which action a person will actually take, we would expect that Henry *will* help him, or at least we think that he *will have to*. This answer is logically warranted by *Modus Ponens* (MP). But what should be concluded from the promise (1), if (3) Bob *does not* lend out his bike? Usually, persons answer that Henry *will not* help Bob either. This inference, however, corresponds to a logically invalid pattern known as *Denial of the Antecedent* (DA).

In general, the valid MP and MT (*Modus Tollens*) as well as the invalid DA and AC (*Affirmation of the Consequent*) are drawn more frequently from conditional promises and threats than from universal conditionals (e.g., Fillenbaum, 1978; Markovits & Lesage, 1990; Newstead, Ellis, Evans, & Dennis, 1997; but see Evans & Twyman-Musgrove, 1998, for a diverging result).

Most people accept the complementary conditional '*If not*-P, *then not*-Q' as following from inducements of the form '*If* P, *then* Q' (Fillenbaum, 1978). Geis and Zwicky (1971) speak of "invited inferences" in normal linguistic usage. Accordingly, the associated truth tables often reflect an equivalence relation instead of an implication (Newstead et al., 1997).

Treating conditional inducements in this way enables one to *detect* effects of different propositional contents on reasoning, but it is not sufficient to *explain* the underlying causes. What is the reason for the DA inference in the introductory example? Furthermore, a simple truth-table analysis is much too restricted to capture conceptual aspects of conditional inducements beyond the if-then relation. Why, for example, is Henry *obliged* to help Bob under certain circumstances? How will Bob react *emotionally* if Henry does not help him? A detailed theoretical analysis is presented to overcome these limitations. It integrates several aspects on different levels: goals and incentives on the motivational level, formulations and inferences on the linguistic level, obligation and permission on the deontic level, action sequences on the pragmatic level, and finally, affective reactions on the emotional level. The multi-level analysis explains the phenomena observed in reasoning studies; new phenomena are predicted and experimentally confirmed.

Levels of Conditional Inducements

(1) Motivational level: The basic level of analysis concerns the motivational situation in which a person utters an inducement. It is determined by *expectations*, *goals* and *incentives*. The speaker (S) wants an addressee (A) to show a certain *goal*-behavior (i.e., to perform a certain action or to refrain from performing an action) with a positive value for himself, the speaker ($S+$: Behavior$_A$). In the introductory example, it was Henry who wanted Bob to lend him his bike. Henry must expect that the addressee is not willing to show this behavior voluntarily, otherwise an inducement would not be necessary. Thus, the speaker has to induce a behavioral change:

Expected behavior (*grey boxes*) $S-$: ¬Behavior$_A$
$\downarrow$
Goal of the speaker S   **$S+$: Behavior$_A$**
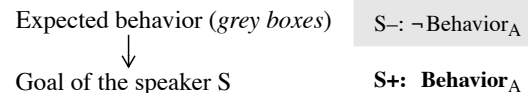
This change can be motivated in two ways: First, the speaker may promise to *reward* the *desired* goal behavior $S+$ with a positive consequence for the addressee

(➥ A+: Reward$_S$). Believing that Bob needs help with his homework, Henry may promise to help him (A+) if Bob lends him his bike (S+). The reward should be under the speaker's control and should *not* occur for any other reason, as otherwise it cannot develop its motivational effect (e.g., Evans & Twyman-Musgrove, 1998). The whole motivational schema may be represented as:

Promise	S–: ¬Behavior$_A$	A–: ¬Reward$_S$
	S+: Behavior$_A$ ➥	**A+: Reward$_S$**
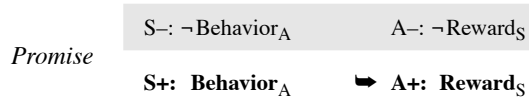
Instead of rewarding the desired behavior, the speaker may *punish* the *undesired* behavior he fears (S–) with a negative consequence (A–). If he usually helps Bob with his homework, Henry can use Bob's expectation and threaten to withdraw his help (A–) if Bob does not lend him his bike (S–). The corresponding schema is:

Threat	S–: ¬Behavior$_A$ ➥	A–: **Punishment$_S$**
	S+: Behavior$_A$	A+: ¬Punishment$_S$
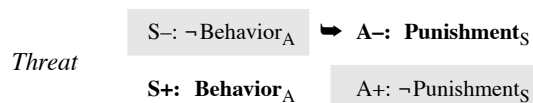
In both cases, the speaker announces (explicitly or implicitly) that he will react positively (A+) if the addressee shows the desired behavior (S+), and negatively otherwise. There is an essential difference, however: If the addressee cooperates (S+), then in the first case he *gets* something he cannot expect without the promise (the reward A+), whereas in the second case he only *avoids* the punishment (A–) without getting anything positive in return.

(2) Linguistic level: The motivational schemas directly determine which formulations are appropriate to express the intended speech act. Conditionals '*If* P, *then* Q' can be used equally well with both schemas. Conditionals point out a necessary consequence 'Q' of an antecedent condition 'P', and that is exactly what the speaker intends on the motivational level: to establish a new, definite consequence for one of the addressee's behavioral options. The canonical formulations are:

"If you do P [S+], then I will reward you with Q [A+]" vs.
"If you do P [S–], then I will punish you by Q [A–]".

Looking at the underlying motivational schemas, it becomes clear why the complementary form '*If not-*P, *then not-*Q' is inferred, and why conditional inferences (MP, MT, DA, AC) seemingly correspond to an equivalence relation. The motivational level suggests that there are two action sequences: a cooperative one and a not-cooperative one. The complementary conditional reflects that part of the motivational background that is not expressed explicitly by the canonical statement. Together, the canonical and the complementary conditional yield the equivalence interpretation. Different from a logical equivalence, however, the reversed form (e.g., "If I reward you with Q [A+], then you will do P [S+]") is not really equivalent to the canonical one. By reversing antecedent and consequent, the temporal order

changes as well, so that the speaker can no longer guarantee that action 'P' is a necessary consequence of the antecedent event 'Q' ('P' is not under his control).

The differences between the motivational schemas also explain why only threats are formulated disjunctively, whereas both promises and threats can be formulated conjunctively (Fillenbaum, 1978). The *conjunctive* formulation expresses the connection between the new consequence set by the speaker and the addressee's behavior:

"Do P [S+] *and* I will reward you with Q [A+]" vs.
"Do P [S–] *and* I will punish you by Q [A–]".

A *disjunction* points out alternatives. In the case of a threat, it enables the speaker to express both his goal S+ and the punishment A–, which are part of alternative action sequences: "*Refrain from* doing P [S+] *or* I will punish you by Q [A–]". If a promise were to be reformulated disjunctively, then either the speaker's goal or his reward could no longer be expressed.

(3) The deontic level deals with the question of which action a person *may* or *must* perform with respect to a social rule (e.g., Beller, 2001). Conditional promises and threats establish such a rule and determine which actions persons are obliged to perform. Since the addressee can freely decide whether or not he cooperates, there is *no* deontic constraint on his behavior. He *may* cooperate, but he *need not*. The speaker's situation is different. Consider the promise

"If you do P [S+], then I will reward you with Q [A+]".

Once the addressee cooperates and fulfills the speaker's goal 'P', the promisor is *obliged* to cooperate and to give reward 'Q'. The promisor himself declared 'Q' to be a necessary consequence of condition 'P', so he *must* guarantee the reward. If the addressee does not cooperate, then there is *no* deontic constraint; the speaker *need not* give the reward, but he is *permitted* to do it voluntarily. Which obligation, however, results from a threat

"If you do P [S–], then I will punish you by Q [A–]"?

Two lines of argumentation are possible here: First, arguing analogously to the promise, the speaker is *obliged to punish* the addressee ('Q') if A does *not* cooperate ('P'). The speaker declared punishment 'Q' to be a necessary consequence of condition 'P', so he *must* react consequently (and indeed perhaps he should, in order to keep his credibility). What is the case if the addressee *cooperates*? By analogy, there is *no* constraint on the speaker's action, so he *need not* punish the addressee, but he actually *may* punish him. An implicit social rule, however, intuitively contradicts this interpretation: A person *must not* be punished without reason, whereas one *may* well give a reward without reason.

Second, it can be argued that the threat implies a *complementary promise* that determines the deontic interpretation: "If you *refrain from* doing 'P' [S+], then I will *not* punish you by Q [A+]". Associated with a promise is an obligation for the speaker to cooperate (A+) once

the addressee has fulfilled his goal (S+). If the addressee refrains from doing 'P' (S+), then the speaker *must* refrain from the punishment. If the addressee does not cooperate, then there is no deontic constraint and the speaker is *permitted* to punish the addressee. Since the punishment is now justified, this interpretation is in line with the implicit social rule mentioned above.

(4) The pragmatic level deals with the question of which actions are actually taken after an inducement has been uttered. Since both persons are assumed to have full freedom of action, four action sequences are possible: If the addressee fulfills the speaker's goal (S+), then subsequently the speaker may also cooperate (A+) or may not (A–). If the addressee does *not* show the goal behavior (S–), then the speaker may not cooperate either (A–) or may cooperate (A+). Common to all four sequences is a particular *temporal order*: The addressee decides first whether he wants to cooperate, whereas the speaker has to react to the addressee's behavior.

(5) Emotional level: Eventually, one of the four action sequences follows a conditional inducement. Each sequence is characterized by goals, expectations and incentives. These factors are directly relevant for the elicitation of emotions (e.g., Lazarus, 1991; Roseman, Antoniou & Jose, 1996). Goal-relevance is a necessary requirement for emotional reactions in general; goal-congruent events elicit positive emotions, while goal-incongruent events elicit negative emotions. Applied to conditional promises and threats, addressee and speaker should feel a positive emotion if the partner cooperates (and fulfills their goal or expectation), while a negative emotion should result if the partner does not cooperate. Which specific emotion arises in a given situation depends on further appraisal dimensions that cannot be described in detail here (for extensive analyses see, e.g., Roseman et al., 1996). Summarizing those studies though, *joy* can be expected when a person gets something positive, *relief* when an expected negative event does not occur, and *anger* when the partner does not cooperate even though he or she is obliged to.

Experiment

The proposed multi-level analysis integrates motivation, linguistics, pragmatics, deontic considerations, and emotions, thereby overcoming the limitations of a purely truth functional analysis of conditional promises and threats. In order to test hypotheses regarding particular facets of the analysis, an experiment was conducted which consisted of two parts.

The starting point of part I was an influential finding of Leda Cosmides (1989). Cosmides showed with domain-specific versions of Wason's (1966) selection task that persons are sensitive to which of the partners involved in a reciprocal exchange is accused of breaking his promise, but *not* to the conditional formulation. It did not make a difference whether the promise was formulated canonically or reversed. The multi-level analysis makes just the opposite prediction; namely that

persons should be sensitive to the formulation of inducements. A reversed inducement is *not* equivalent to the original one, since it also implies a reversal of the temporal order and of the roles (*speaker-addressee-asymmetry*): Given a particular role allocation, the canonical conditional should be preferred to the reversed one, the complementary conditional (and not the reversed one) should be preferred as implication, and the action sequence should be "addressee first". In addition, it was assessed which *emotional reactions* persons attribute to the addressee if the speaker keeps or breaks "the rule".

Part II of the experiment focusses on an aspect that has not been explored until now: the *deontic inferences* people draw from conditional promises and threats. The prediction for promises is clear: If the addressee has fulfilled the speaker's goal, then an obligation arises for the speaker to give the promised reward; otherwise there is no such obligation. The deontic interpretation of conditional threats, however, is not equally clear. Do people infer (from the conditional form) an obligation for the speaker to punish the addressee A if A does not cooperate, or do they rather infer (from the *complementary* promise) an obligation to cooperate and refrain from the punishment if the addressee cooperates? It was expected that the second interpretation would predominate since it is not in conflict with general moral rules.

Method

Both parts of the experiment were integrated into one questionnaire. They used different basic scenarios from which four context stories each were constructed. The stories in part I dealt with the exchange situation mentioned in the introductory example (help with homework in exchange for borrowing a bike) but varied with regard to role allocation and speech act. Four tasks had to be solved, which focussed on the linguistic, pragmatic and emotional level. The context stories in part II were constructed from two different scenarios; one dealt with mutual lending of things and the other with mutual destruction of toys. Again, the speech acts varied, but this time only one role allocation was used. Four tasks asked for deontic inferences from the inducements. To facilitate the discussion of the results, stories and tasks for both parts are described later in separate sections.

Participants: 40 students from two introductory cognitive psychology courses (at the University of Freiburg) participated in the experiment. 18 students were male and 22 female, with a mean age of $M = 23.8$ years (*range*: 20-39 years).

Design: Participants were randomly assigned to one of four groups ($n = 10$). The four context stories of each part varied between groups. The speech acts were balanced within groups: If part I was about a promise then part II dealt with a threat (and vice versa).

Procedure: The questionnaire was administered at the beginning of the first course session. After a general instruction on the first page, the questionnaire began with the tasks of part I, followed by the tasks of part II.

The tasks were ordered as described below and each was written on a new page. Participants were instructed to work on the tasks in the given order, and to take as much time as needed. All materials were presented in German.

Part I: Assessing the Speaker-Addressee-Asymmetry and Emotional Reactions

In order to assess the speaker-addressee-asymmetry, four context stories were designed, which were similar to the introductory exchange scenario. The stories described the person's goals and their usual behavior; they varied with regard to the intended speech act (promise vs. threat) and the roles (speaker vs. addressee). In two stories, Henry wants to borrow Bob's bike. He tries to achieve this goal either by a promise or by a complementary threat (canonical conditionals: "If you lend me your bike, then I will help you with your homework" vs. "If you do *not* lend me your bike, then I will *not* help you with your homework"). In the other two stories, the roles were interchanged: This time, Bob wants Henry to help him with his homework and he tries to achieve this goal by the reversed promise or threat ("If you help me with my homework, then I will lend you my bike" vs. "If you do *not* help me with my homework, then I will *not* lend you my bike"). Each story was followed by four tasks.

(1) Formulation task: In the first task, the motivational background was given together with the type of speech act to be used. The participants were then instructed to choose from four given conditionals the one that was most appropriate for the speaker's intended inducement. The conditionals were derived from the canonical one by reversing and negating 'P' and 'Q'. Table 1 shows the results. As predicted, the canonical conditionals were clearly preferred (90% aggregated over all context stories). If the speech act changed then the complementary conditional was chosen, whereas if the role allocation changed then the reversed form was preferred.

(2) Inference task: From this task onwards, the context stories had been supplemented by the canonical conditional. The instruction called for participants to choose an adequate implication of the given conditional

Table 1: Frequency of choosing each conditional as the speaker's adequate promise or threat ($n = 10$ in each condition; canonical conditionals are **bold**-faced).

Conditional	Henry's		Bob's	
	Promise	Threat	Promise	Threat
If bike *then* help	**10**	1	-	-
If no bike *then* no help	-	**9**	-	-
If help *then* bike	-	-	**10**	3
If no help *then* no bike	-	-	-	**7**

Table 2: Frequency of choosing the most adequate implication of a given promise or threat ($n = 10$ in each condition; complementary inducements are **bold**-faced).

Conditional	Henry's		Bob's	
	Promise	Threat	Promise	Threat
If bike *then* help	given	**9**	-	-
If no bike *then* no help	**8**	given	1	2
If help *then* bike	2	-	given	**8**
If no help *then* no bike	-	1	**9**	given

from the three others known from the formulation task. The results are presented in Table 2. As predicted, participants preferred the complementary conditional, which leaves the order of the actions the same, over the reversed one (85.0% vs. 12.5%, aggregated over all tasks, $\chi^2(1, n = 39) = 21.6$; $p < 0.001$).

(3) Sequence task: In the third task, the participants had to decide on the order of the actions once the conditional inducement had been made. It was expected that the addressee would decide first whether he is willing to cooperate. Without exception, all participants (100%) answered the sequence question according to this prediction. If Henry made the inducement then Bob decides first whether he lends out his bike, and vice versa. Thus, changing roles reversed the typical action sequence.

Altogether, the results of the first three tasks corroborate the predicted speaker-addressee asymmetry.

(4) Emotion task: After the introduction of the conditional inducement in the context story, the emotion task mentioned that the addressee *cooperated* and fulfilled the speaker's goal (S+). Participants had then to decide (i) what the *speaker* has to do in order to keep versus not to keep 'the rule', and (ii) which feeling the *addressee* will have afterwards. Three critical emotions (relief, joy, and anger) were given together with four distractors in a multiple-choice format and participants were instructed to choose the most appropriate one.

(i) To keep the rule means that, given that the addressee cooperated before (S+), the speaker will also cooperate (A+). Cooperation corresponds to the MP inference in the case of a conditional promise '*If* P [S+], *then* Q [A+]', but to the NA inference in the case of a threat '*If* P [S–], *then* Q [A–]'. Not keeping the rule means reacting defectively towards the addressee (A–) *even though* the addressee fulfilled the speaker's goal (S+). In the case of a promise, defection violates the conditional statement itself ('P *and not*-Q'). In the case of a conditional threat, however, defection corresponds to '*not*-P *and* Q' and violates the complementary conditional. The results show that the participants had a clear understanding of these regularities: Asked what the speaker has to do in order to "keep the rule", all persons (100.0%) choose the MP-option given a promise, but the NA-option (95.0%) given a threat (aggregated over both

Table 3: Attributed emotional reactions of the addressee on keeping vs. not keeping a promise/threat.

Emotion		Keeping		Not Keeping	
		Promise	Threat	Promise	Threat
Relief	(+)	5	10	-	-
Joy	(+)	15	5	-	1
Anger	(−)	-	3	19	19
Others	(−)	-	3	3	1

The frequencies do not add up to 20 in each column because four persons marked two emotions.

role versions). Correspondingly, all persons (100.0%) answered that not keeping a promise corresponds to 'P *and not*-Q', while again 95.0% chose the complementary category '*not*-P *and* Q' in the case of a threat.

(ii) How does the addressee react emotionally in these cases? Table 3 lists positive and negative emotions (+/−) aggregated over both role versions. The answers are in line with the predictions from appraisal theories: If the speaker keeps the rule then the addressee is said to feel a *positive* emotion (85.4% positive vs. 14.6% negative); otherwise a *negative* emotion results (2.3% positive vs. 97.7% negative; $\chi^2(1, n = 84) = 59.1$; $p < 0.001$). In the latter case, the addressee was uniformly said to feel *angry*, whereas in the former case different emotions were associated with the two speech acts: Keeping the promise mostly resulted in *joy* (75% joy vs. 25% relief) while in the case of a threat *relief* predominates (23.8% joy vs. 47.6% relief; $\chi^2(1, n = 35) = 6.08$; $p = 0.014$); on three occasions the addressee was even said to feel *angry*. This may be the result of having been forced to cooperate by a threat. Whether these differences reflect differences between the speech acts or between the incentives (lending out one's bike vs. giving help with the other's homework) is open to further analyses.

Part II: Assessing Deontic Inferences

Part II aimed to test the hypothesis that the deontic interpretation of a conditional threat follows the interpretation of the corresponding complementary promise: If the addressee cooperates, then the speaker is obliged to cooperate; otherwise he is not. Thus, the deontic inferences from complementary promises and threats need to be compared. This was done in two content versions (mutual lending vs. mutual destruction).

The scenarios of mutual lending stated that Peter would like to borrow Corinna's comic book. He tries to achieve this goal either by a promise ("If you lend me your comic book, then I will lend you my computer game") or by a complementary threat ("If you do *not* lend me your comic book, then I will *not* lend you my computer game"). The mutual destruction scenario concerned two quarreling children. Sarah is about to smash

George's Lego car. George would like to prevent Sarah from smashing his car. George knows that Sarah has set up her Playmobil farm. Again, George tries to achieve this goal either by a threat ("If you smash my car, then I will smash your farm") or by a complementary promise ("If you do *not* smash my car, then I will *not* smash your farm"). Altogether, four context stories were used. Each was followed by four tasks that asked for deontic inferences about the speaker's action after the addressee had already cooperated versus the speaker's action after he had not.

Task 1+2: The addressee cooperated: The first two tasks supplemented the context story with the information that the addressee fulfilled the speaker's goal (i.e., Corinna lent her comic book to Peter, and in the other scenario, Sarah did not smash George's Lego car). The first task required participants to decide whether the addressee's cooperation implies an obligation for the speaker to cooperate also. The second task asked whether the speaker is permitted to cooperate. It was expected that the deontic interpretation of the threat would follow the one of the complementary promise in both content versions equally: The speaker is *obliged* to cooperate (i.e., Peter must lend out his computer game while, in the other scenario, George must refrain from smashing Sarah's Playmobil farm), and the speaker is *permitted* to do so.

Task 3+4: The addressee did not cooperate: The other two tasks stated that the addressee did not fulfill the speaker's goal (i.e., Corinna did not lend out her comic book, while Sarah smashed George's Lego car). Again, the participants had to decide whether the speaker is obliged to cooperate and whether he is permitted to do so. This time it was predicted that – independent from the speech act and the content – *no obligation* would arise for the speaker (i.e., Peter need not lend out his computer game and George need not refrain from smashing Sarah's Playmobil farm), but again the speaker is *permitted* to cooperate.

To test the hypothesis that the deontic interpretation of conditional threats is equivalent to the interpretation of the complementary promises, a log-linear analysis (Kennedy, 1992) with two independent variables (speech act and content) was performed for each task. The analyses corroborated the hypotheses: neither the factor *speech act* nor the factor *content* significantly contributed to the data. Both factors could be removed from the analyses without loosing the fit of the resulting log-linear model (for each analysis: $G^2 < 10.5$, df = 6, $p > 0.10$). It is thus justifiable to aggregate the data of each task over the four groups.

The aggregated results are shown in Table 4. Most participants drew the deontic inferences that were predicted from the explicit (or implicit) conditional promise: An obligation arises for the speaker only if the addressee A cooperates (67.5% *obligation* vs. 0% *no obligation*), but not if A does not cooperate (10.0% *obligation* vs. 77.5% *no obligation*; $\chi^2(1, n = 62) = 47.8$; $p < 0.001$). Independent from the fact whether the

Table 4: Percentages of deontic inferences aggregated over content versions and speech acts ($N = 40$ in each condition; expected inferences are **bold**-faced).

	The addressee A ...	
	cooperated	did not cooperate
Obligation: Must the speaker S cooperate?		
obligation	**67.5**	10.0
no obligation	0.0	**77.5**
undecidable	32.5	12.5
Permitted: May the speaker S cooperate?		
permitted	**67.5**	**50.0**
not permitted	5.0	22.5
undecidable	27.5	27.5

addressee cooperated or not, the speaker was said to be permitted to cooperate (58.8% *permitted* compared to 20.6% *not permitted* and *undecidable* answers on average; $\chi^2(1, n = 80) = 23.3; p < 0.001$).

Summary and Discussion

The results of both experimental parts show a clear and consistent picture that strongly corroborates the predictions from the multi-level analysis.

Conditional inducements are specifically formulated depending on the motivational background and the intended speech act. Thus, conditional promises and threats cannot simply be reversed. This is due to the speaker-addressee-asymmetry: The canonical conditional and its reversal correspond to speech acts of different persons, they have different implications and are associated with complementary action sequences.

It could further be shown that the deontic interpretation of conditional threats is not derived from the conditional formulation, but from the implicit complementary promise. No matter whether a person uses a promise or a threat to pursue his or her goal, there is an obligation to cooperate if the addressee fulfills this goal.

Finally, conditional inducements concern individual goals, actions, and incentives, and are thus highly emotional speech acts. The addressee was said to feel *joy* or *relief* when the speaker kept "the rule" and cooperated, whereas the addressee reacted *angrily* when the speaker broke the rule. This is in line with predictions from appraisal theories of emotion (e.g., Lazarus, 1991; Roseman et al., 1996). Several questions, however, are open to further analyses: Which emotional reactions are associated with other possible action sequences? How does the content of the inducements (e.g., reciprocal exchange or mutual destruction) affect the emotional reactions? Further experiments are needed to answer these questions.

In short, the multi-level analysis of conditional inducements brings together motivation, linguistics, pragmatics, deontic considerations, and emotions. It thereby overcomes the limitations of a purely truth functional analysis often found in reasoning studies.

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