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Advice conditionals about tips and warnings: interpretations and inferences

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ABSTRACT

Two experiments examine how people interpret and reason about advice conditionals, such as tips, for example, “if you study more your grades will improve”, and warnings, for example, “if you stop exercising you will gain weight”. Experiment 1 showed that when participants reason about whether a tip or warning could be true in different situations, their judgments correspond to a biconditional or conditional interpretation on about half of all trials, but to an enabling or tautology interpretation on many others. Experiment 2 showed that participants make few modus ponens and tollens inferences from tips and warnings, and more modus ponens inferences from tips than warnings. The implications for alternative theories are discussed.

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Introduction

The US president Barack Obama warned about climate change in his final UN address, “If we don’t act boldly, the bill that could come due will be mass migrations, and cities submerged and nations displaced, and food supplies decimated, and conflicts born of despair” (Chemnick, 2016). People often give each other advice, including warnings about bad outcomes, and tips about good outcomes. Understanding and making accurate inferences from advice can have profound effects on people’s lives, for example, an evaluation of the Tips From Former Smokers (Tips) TV ad campaign in the US showed that attempts by smokers to quit increased by a significant amount following its hard-hitting, emotional advice (McAfee, Davis, Alexander, Pechacek, & Bunnell, 2013). Yet how people understand and reason about advice has been somewhat neglected. Our aim is to examine the cognitive processes that underlie the interpretations and inferences that people endorse from advice conditionals. We first distinguish advice from inducement before we focus on a consideration of different interpretations of advice and inferences from advice conditionals; then we report two experiments that test the effect of different interpretations on reasoning about advice.

Distinctions between advice and inducement

Advice is much milder than inducement and most of what is known about reasoning from advice has been established in the context of contrasting it with inducement. Advice shares some similarities with inducement: tips, like promises, focus on good outcomes and provide positive information about what should be done, whereas warnings, like threats, focus on bad outcomes and provide negative information about what should not be done (e.g. Ohm & Thompson, 2004). Hence, studies of advice often compare and contrast it with inducement (e.g. Dieussaert, Schaeken, & d’Ydewalle, 2002) and they have led to two key discoveries about advice.

First, readers discriminate rapidly between tips and promises, and between warnings and threats (e.g. Haigh, Stewart, Wood, & Connell, 2011; Wray, Wood, Haigh, & Stewart, 2016). Online comprehension studies indicate they do so by relying on pragmatic cues such as whether the outcome is positive for the listener—to discriminate promises and tips vs. threats and warnings, and whether the speaker controls the outcome—to discriminate further, between promises vs. tips, and threats vs. warnings (e.g. Evans, 2005; Haigh et al., 2011; López-Rousseau & Ketelaar, 2004; Stewart, Haigh, & Ferguson, 2013;

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see also Bonnefon, 2009; Castelfranchi & Guerini, 2007; Evans, Neilens, Handley, & Over, 2008). For example, a warning may sometimes be a veiled threat, that is, not genuine advice but an attempt at inducement, and to distinguish them may require an assessment of the extent to which the speaker can bring about the outcome (e.g. Wray et al., 2016).

Advice and inducements are important “speech acts” (e.g. Searle, 1969). Tips, like promises, can be communicated with affirmative complex conditional connectives, other than “if”, such as “provided that”, “on condition that”, “so long as”, and warnings, like threats, can be communicated by negative complex conditional connectives such as “unless” (e.g. Fillenbaum, 1986; Montolio, 2000). They have the goal of getting the hearer to carry out the action mentioned in the promise or tip, and to not carry out the action mentioned in the threat or warning (e.g. Ohm & Thompson, 2004). The speaker of a promise tries to encourage another person to do something by offering a reward; the speaker of a threat tries to deter another person from doing something by indicating a punishment (e.g. Byrne, 1989; Egan & Byrne, 2012; Fillenbaum, 1986). Hence, importantly, the speaker of a promise or threat usually has some control over the outcome and is responsible for bringing about the promised reward or threatened punishment, even though it may be costly for them to do so (e.g. Dieussaert et al., 2002; Ohm & Thompson, 2004; Verbrugge, Dieussaert, Schaeken, & Van Belle, 2004). In contrast, advice is much gentler than inducement. A speaker giving advice in a tip or warning conveys a wish to change the behaviour

of their hearer but merely speculates about rewards or punishments that may be brought about (you may enjoy good health if you stop smoking, cities may be submerged if we do not stop climate change); and importantly, these outcomes are outside the control of the speaker (e.g. Fillenbaum, 1976; 1986). Hence, the means by which inducements attempt to change behaviour are far stronger than the means by which advice attempts to do so. As a result, the relation of the advised action to its tipped or warned outcome may be considerably weaker and more uncertain than the relation of an induced action to its promised or threatened outcome (e.g. Newstead, Ellis, Evans, & Dennis, 1997; Ohm & Thompson, 2004; 2006; see also Newstead, 1997).

The second discovery about advice is that people make fewer inferences from advice than from inducements. For example, for conditionals of many different sorts of content, people readily make the simple modus ponens inference, for example, given “if John puts on a suit, he goes to work” and the information “John puts on a suit”, usually close to 100% of participants infer “he goes to work” (see Manktelow, 2012 for a review). But fewer participants make the modus ponens inference for an inducement, for example, given the promise, Ann says to John, “if you put on a suit, I will give you 10 euro” and the information, “John puts on a suit”. Only about 60% of participants infer that Ann gives him 10 euro (e.g. Newstead et al., 1997; Ohm & Thompson, 2004). And even fewer participants make the modus ponens inference for an advice conditional, for example,

Table 1. The percentages of four sorts of inferences made from advice conditionals, tips and warnings, in four studies.

	Modus ponens	Modus tollens	Denial of antecedent	Affirmation of consequent	
Conditional:	If A then B	If A then B	If A then B	If A then B	
Minor premise:	A	Not-B	Not-A	B	
Conclusion:	B	Not-A	Not-B	A	
Tip	34	19	22	23	a
	40	28	40	39	b
	60	38	40	41	c
<i>Low control</i>	48	23	38	27	d
<i>High control</i>	77	37	61	58	d
Warning	45	36	34	40	a
	49	40	31	34	b
	75	64	55	55	c
<i>Low control</i>	51	25	43	31	d
<i>High control</i>	83	48	64	47	d

a: From Ohm and Thompson (2004).

b: From Ohm and Thompson (2006).

c: From Newstead et al. (1997).

d: From Evans and Twyman-Musgrove (1998).

Table 2. Examples of advice conditionals (illustrated for tips) that express enabling and conditional interpretations, the contingencies true and false for them, and the inferences they support.

Enabling	Example	"If you study more your grades will improve" Disabler: Richard has no aptitude for the subject	If A B
	Contingencies	<i>True:</i> Richard studies more and his grades improve Richard does not study more and his grades do not improve Richard studies more but his grades do not improve <i>False:</i> Richard does not study more and his grades improve	<i>True:</i> A & B Not-A & not-B A & not-B <i>False:</i> Not-A & B
	Inferences	MP: Richard studied more ∴ no conclusion possible MT: Richard's grades did not improve ∴ no conclusion possible AC: Richard's grades improved ∴ he studied more DA: Richard did not study more ∴ his grades did not improve	MP: A ∴ nothing MT: not-B ∴ nothing AC: B ∴ A DA: not-A ∴ not-B
Conditional	Example	"If you study more your grades will improve" Alternative: the test will not be very difficult	If A B
	Contingencies	<i>True:</i> Richard studies more and his grades improve Richard does not study more and his grades do not improve Richard does not study more but his grades improve <i>False:</i> Richard studies more and his grades do not improve	<i>True:</i> A & B Not-A & not-B Not-A & B <i>False:</i> A & not-B
	Inferences	MP: Richard studied more ∴ his grades improved MT: Richard's grades did not improve ∴ he did not study more AC: Richard's grades improved ∴ no conclusion possible DA: Richard did not study more ∴ no conclusion possible	MP: A ∴ B MT: not-B ∴ not-A AC: B ∴ nothing DA: Not-A ∴ nothing

Keys: MP: modus ponens; MT: modus tollens; DA: denial of the antecedent; AC: affirmation of the consequent.

given the tip, Ann says to John "if you put on a suit you will impress your boss" and the information, "John puts on a suit". Only about 30% of participants infer that John impresses his boss (e.g. Newstead et al., 1997; Ohm & Thompson, 2004). The difference between inferences from advice and inducement is reduced when the speaker has the same amount of control over the outcome (Evans & Twyman-Musgrove, 1998), although control does not appear to account for all of the variance (Dieussaert et al., 2002). Table 1 outlines the percentages of inferences that people tend to make from advice conditionals based on several studies (Evans & Twyman-Musgrove, 1998; Newstead et al., 1997; Ohm & Thompson, 2004; 2006). Our aim is to examine the influence of different sorts of interpretations of advice conditionals on the inferences that people are willing to make from them. We test the idea that people make few inferences from tips and warnings because they come to interpretations of them that are consistent with many different possibilities.

Interpretations and inferences for advice

Given the mild nature of most advice, the relation between the advised action and the tipped or warned outcome may be consistent with several possibilities. Advice may be interpreted in different ways, given that semantic and pragmatic factors influence the interpretation of a conditional (e.g.

Johnson-Laird & Byrne, 2002; Quelhas, Johnson-Laird, & Juhos, 2010).

Consider the tip, "if you study more your grades will improve" (if A then B). The tip is consistent with the possibility, "you study more and your grades improve" (A and B) and also with the possibility "you do not study more and your grades do not improve" (not-A and not-B). But a listener may be able to retrieve a counterexample that is a "disabler" to the tip, such as that he or she has no aptitude for the subject matter. This additional background condition is required to result in the outcome of grades improving, and so the tip is also consistent with the instance, "you study more but your grades do not improve" (A and not-B). Or a listener may be able to retrieve a counterexample that is an "alternative" to the tip, such as that the test will be very easy. Because this alternative to studying more will lead to the outcome of grades improving, the tip is consistent with the possibility, "you do not study more and your grades improve anyway" (not-A and B).

One interpretation of the tip is that it expresses an enabling relation. On this interpretation, the tip is consistent with the following possibilities,

You study more and your grades improve	A and B
You do not study more and your grades do not improve	not-A and not-B
You study more but your grades do not improve	A and not-B

The listener retrieves a disabler to the tip and so the action is not sufficient for the outcome—other

conditions must also be present to bring about the outcome. People readily retrieve disablers for various sorts of relations such as causal conditionals (e.g. De Neys, Schaeken, & d'Ydewalle, 2003; Markovits & Potvin, 2001). On this interpretation, the listener does not retrieve an alternative to the tip and so the action is necessary for the outcome—the situation in which you do not study more and your grades improve is inconsistent with the tip.

If participants retrieve a disabler, some inferences from advice conditionals will be suppressed. For example, given “Richard studied more”, participants will *not* make the modus ponens conclusion, “therefore Richard’s grades improve”, if they have thought about, or been told about, a disabler such as “Richard has no aptitude for the subject matter”, as Table 2 outlines. Suppression of the modus ponens and tollens inferences occurs for various sorts of conditional relations, including inducements, when disablers are explicitly provided (e.g. Byrne, 1989; see also Byrne, Espino, & Santamaria, 1999) or retrieved (e.g. Cummins, Lubart, Alksnis, & Rist, 1991; De Neys et al., 2003; see also Oaksford & Chater, 1998; Stevenson & Over, 1995). Individuals with higher working memory capacity are better at retrieving, and at inhibiting, counterexamples, and the process can be interrupted by secondary tasks that compete for working memory resources (e.g. De Neys, 2011; De Neys, Schaeken, & d'Ydewalle, 2005b). The retrieval of disablers affects the ratings participants provide of the extent to which the outcome occurred, for example, Richard’s grades improved, given that the action occurred, for example, Richard studied more, for inducements and advice (Dieussaert et al., 2002).

Another interpretation of the tip is that it expresses a conditional relation. The tip is consistent with the following instances:

You study more and your grades improve	<i>A and B</i>
You do not study more and your grades do not improve	<i>not-A and not-B</i>
You do not study more but your grades improve	<i>not-A and B</i>

The listener retrieves an alternative to the tip and so the action is not necessary for the outcome—alternatives to the action such as the test being easy, could bring about the same outcome. For some conditionals, such as causal conditionals, people readily retrieve alternatives (e.g. De Neys et al., 2003; Markovits & Potvin, 2001; Quinn & Markovits, 2002; Thompson, 1994; Thompson & Byrne,

2002). On this interpretation, the listener does not retrieve a disabler to the tip and so the action is sufficient for the outcome—the situation in which you study more and your grades do not improve is inconsistent with the tip.

If people retrieve alternatives to a tip or warning, different inferences from advice conditionals will be suppressed. For example, given the information “Richard’s grades improved” participants will *not* endorse the affirmation of the consequent conclusion, “Richard studied more”, if they have thought about, or been told about, an alternative, such as “the test is very easy”. For other sorts of conditional relations, such as causes, an alternative cause, whether retrieved, or explicitly provided, suppresses the denial of the antecedent and affirmation of the consequent inferences (e.g. Markovits, 1984; Romain, Connell, & Braine, 1983), at least when participants judge whether or not a conclusion follows (Markovits, Lortie Forgues, & Brunet, 2010), if not when they rate the likelihood of a conclusion (Geiger & Oberauer, 2007). The retrieval of alternatives has a small effect on the ratings participants provide of the extent to which the action occurred, for example, Richard studied more, given that the outcome occurred, for example, Richard’s grades improved, for inducements and advice (Dieussaert et al., 2002).

A strong interpretation of the tip is that it expresses a bi-conditional relation. The tip is consistent with the first two instances only,

You study more and your grades improve	<i>A and B</i>
You do not study more and your grades do not improve	<i>not A and not-B</i>

The listener does not retrieve a disabler and so the action is sufficient for the outcome—the situation in which you study more and your grades do not improve is inconsistent with the tip; and the listener does not retrieve an alternative and so the action is also necessary for the outcome—the situation in which you do not study more and your grades improve is also inconsistent with the tip. The interpretation may arise because participants do not retrieve counterexamples, or they inhibit them. Some sorts of relations, such as causal relations, are interpreted in this way (e.g. Cummins et al., 1991; De Neys, Schaeken, & d'Ydewalle, 2005a; Frosch & Byrne, 2012; Goldvarg & Johnson-Laird, 2001), and so too are some inducements (Beller, Bender, & KuhnMünch, 2005; Evans &

Twyman-Musgrove, 1998; Markovits & Lesage, 1990; Ohm & Thompson, 2004). If people do not retrieve counterexamples, either disablers or alternatives, none of the inferences will be suppressed.

Finally, a weak interpretation of the tip is that it expresses a tautology relation in which the tip is consistent with every situation, and the advised action is neither sufficient nor necessary for the outcome. The listener retrieves a disabler to the tip and so the action is not sufficient for the outcome; and the listener also retrieves an alternative to the tip and so the action is not necessary for the outcome. In this case, all of the inferences will be suppressed.

Our aim is to examine interpretations and inferences about tips and warnings. The first experiment examines the interpretations people reach of advice conditionals and compares the situations that they consider could be true for tips and warnings. The second experiment compares the inferences that people make from tips vs. warnings.

Experiment 1

The aim of the experiment was to examine the way in which participants interpret an advice conditional. Participants were given various advice conditionals presented in a sensible context and their task was a novel “collective” truth table task (Johnson-Laird & Goodwin, 2014). They were asked to judge whether a set of assertions could all be true at the same time. For example, participants were told:

Warren is driving to town with his girlfriend, and he is trying to find a place to park. Warren’s girlfriend points out that “if you park too close to the fire hydrant, you will get a ticket”. Warren did not park too close to the fire hydrant. Warren got a ticket. Could all of these assertions be true at the same time?

They indicated their judgment by choosing from the options, Yes, No, or Not possible to say. They made judgments corresponding to four different situations, for example in another situation they were told,

Warren’s girlfriend points out that “if you park too close to the fire hydrant, you will get a ticket”. Warren parked too close to the fire hydrant. Warren did not get a ticket. Could all of these assertions be true at the same time?

The four situations had the structure, (1) If A then B. A. B. (2) If A then B. Not-A. Not-B. (3) If A then B. Not-A. B. (4) If A then B. A. Not-B.

Our aim is to test the sorts of interpretations that participants come to, for tips and warnings. We examine the frequency of different interpretations including the conditional, enabling, biconditional, and tautology interpretations outlined earlier. Some evidence suggests that advice is instead interpreted as a “defective truth table”, that is, when the antecedent does not occur, for example, he does not park too close to the hydrant, it is irrelevant whether the consequent occurs or not, for example, he does or does not get a ticket (Newstead et al., 1997). For example, a truth table task presents participants with a conditional, such as, “if you park too close to the fire hydrant, you will get a ticket” and asks them to evaluate each of four instances as true with respect to it. In studies availing of such a task, participants tend to judge a situation such as “he parked too close to the fire hydrant and he got a ticket” (A and B) as supporting the conditional and a situation such as “he parked too close to the fire hydrant and he did not get a ticket” as contradicting it (A and not-B); they judge the remaining two situations as telling them nothing about the conditional (Newstead et al., 1997). The “defective truth table” has been taken as evidence that people understand a conditional “if A then B” by adding the “if” part, A, to their beliefs and calculating the probability of the “then” part, B (Evans, 2007; Evans & Over, 2004; Oaksford & Chater, 2007). They think about true antecedents only on this account, and they do not think about whether or not the “then” clause follows in the case of a negated “if” clause (e.g. Over, Hadjichristidis, Evans, Handley, & Sloman, 2007; Thompson, Evans, & Handley, 2005).

However, the pattern of evaluations on a truth table task in general tends to differ from the cases that individuals spontaneously list as possible (e.g. Barrouillet, Gauffroy, & Lecas, 2008). The truth table task requires participants to judge in what cases is it true that if A then B, but participants may misunderstand their task to be to judge if A, in what cases is it true that B (Byrne & Johnson-Laird, 2009). The novel collective truth table task has a clearer requirement. Participants are given a conditional and its affirmed or negated components for example, “if A then B. not-A. B.” and they must judge whether all of the statements could be true at the same time (Johnson-Laird & Goodwin, 2014). The aim of the experiment was to examine

participants' interpretation of advice conditionals using this novel collective truth table task.

Method

Participants

The participants were 27 students from ISPA-IU Lisbon. There were 25 women and 2 men and their ages ranged between 19 and 46 years with a mean age of 23 years.

Materials

The materials comprised the 20 conditionals used by Ohm and Thompson (2004) and four new items (see the Appendix). We first tested the materials to establish the frequency with which participants generated disablers and alternatives to each conditional.

Materials Test: We gave the pool of 24 conditionals to a set of participants who did not take part in the main experiment, to carry out a counterexamples generation task (adapted from Cummins et al., 1991). In the disablers generation task, they were given, for example, a warning:

Anne has recently been very busy at work. As a result, she has stopped going to the gym. Her friend tells her "If you stop exercising, you will gain weight".

And then we gave them the information:

In the meantime we know that:

Anne stopped exercising but she did not gain weight.

Their task was:

Please give as many explanations as you can think of to justify this outcome.

We expected they could readily generate disablers, for example, that Anne stopped exercising but she did not gain weight because she ate very little, or she was naturally inclined to be light. In the alternatives generation task they were told instead:

Anne did not stop exercising but she gained weight.

We expected they could also generate alternatives, for example, that Anne did not stop exercising but she gained weight because she ate more, or she was naturally inclined to be heavy. The aim of the materials test was to assess the frequency with which participants generated disablers and alternatives to advice conditionals that

contained tips and warnings. Every participant was given the 24 conditionals, 12 tips and 12 warnings.

Half of the participants were given the disablers generation task, consisting of a conditional, if A then B, and an instance, A and not-B, and the other half were given the alternatives generation task, consisting of a conditional, if A then B, and an instance, not-A and B. Their task was to give as many explanations as they could think of to justify the outcome. The conditionals were presented in a different randomised order to each participant.

The participants in the materials test were 26 first year psychology students from ISPA-IU Lisbon. There were 20 women and 6 men, and their ages ranged from 17 to 40, with an average age of 23 years. They were assigned at random to the Alternatives group ($n = 12$) or the Disablers group ($n = 14$). The conditionals were presented in a booklet and participants recorded their responses in the booklet. Each conditional was presented on a separate page and participants were asked to complete the conditionals in the order in which they received them. The participants were tested in a group.

Five participants were eliminated prior to any data analysis because they did not complete 60% or more of the problems. Prior to any data analysis we eliminated "low quality" counterexamples (as defined by Verschueren, De Neys, Schaeken, & d'Ydewalle, 2002; Verschueren, Schaeken, & d'Ydewalle, 2005), that is, answers that referred to luck or magic or that reflected a non-literal meaning of the conditional. Ten participants were eliminated because more than 40% (and in some cases up to 70%) of their answers were "low quality" counterexamples. In retrospect the task, which took about one hour, may have been too demanding for some participants, which resulted in the high elimination rate. We also identified counterexamples that were merely repetitions of the same idea, such as "It was his mother's birthday", "it was his father's birthday", "it was his brother's birthday", and counted them as a single counterexample, "a family member's birthday", which accounted for 25% of answers. The overall inter-rater agreement for these judgments was $k = .85$; $p < .0001$.

The materials test showed that participants generated more counterexamples to tips than warnings, $F(1,24) = 9.156$, $p < .006$, $\eta_p^2 = .28$, as shown by a 2 (conditional: tips vs. warnings) \times 2

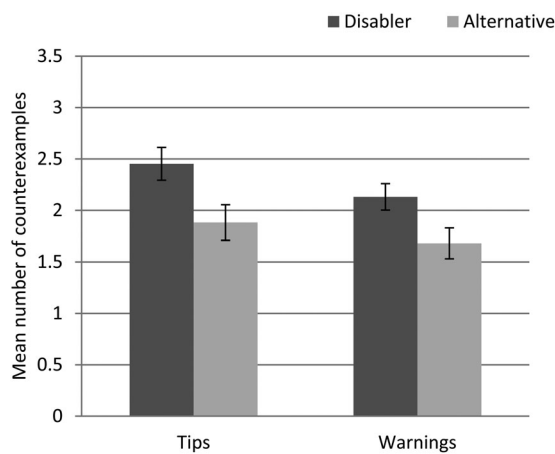


Figure 1. The mean number of disablers and alternatives generated for tips and warnings in the materials test. Error bars are standard error of the mean.

(counterexample: alternatives vs. disablers) ANOVA with repeated measures on the first factor, on the number of counterexamples generated by participants, as Figure 1 shows. They also generated more disablers than alternatives, $F(1,24) = 6.62$, $p < .017$, $\eta_p^2 = .22$. The two variables did not interact, $F < 1$. Overall, participants generated on average about two counterexamples for each conditional, as Table 3 shows, with a range of $M = 1.25$ to $M = 3.5$ for disablers and a range of $M = .83$ to $M = 3.0$ for alternatives.

In the experiment proper, participants received 16 conditionals selected at random from the pool of 24 conditionals, so that each participant received 8 tips and 8 warnings. The conditionals for each participant were selected at random from the pool of 12 tips and 12 warnings, to create different sets of tips and warnings in such a way that the full set of 12 tips and 12 warnings was used equally throughout the experiment.

Design and procedure

Participants acted as their own controls. They received a set of 8 tips and 8 warnings, and for each one, they were given four instances corresponding to (1) If A B. A. B. (2) If A B. Not-A. Not-B. (3) If A B. Not-A. B. (4) If A B. A. Not-B. Hence each participant completed judgments for the 4 instances for each of the 16 conditionals, that is, a total of 64 judgments. The design was thus a 2 (conditional: tips, warnings) \times 4 (instance: A B, not-A not-B, Not-A B, A not-B) within participant design. Half of the participants completed the tips first, and the warnings second, and the other half completed the conditionals in the opposite order. The instances were presented in a different randomised order for each participant.

The problems were presented on computers using e-prime software and each screen contained

Table 3. Mean number of counterexamples (disablers and alternatives) for 12 warnings and 12 tips in the materials test.

	Disablers ($n = 12$)	Alternatives ($n = 14$)
<i>Warnings</i>		
* If you stop exercising, you will gain weight	2.64	2.08
* If you wander away from me, you will get lost	2.57	0.67
* If you park too close to the fire hydrant, you will get a ticket	1.71	2.33
* If you close the railway line, many people will move to a bigger city	1.71	1.58
If you wear jeans to work you will be fired	2.21	2.50
If we fire the drummer, we will have to cancel the next show	2.29	2.17
If you continue missing shots, you will be dropped from the team	2.43	1.50
If you tease the dog, it will bite you	2.07	1.08
If you find an apartment close to the freeway, the traffic will annoy you	2.29	1.17
if you put your glasses to read you will feel better	2.21	1.92
if you have unprotected sex, you will get pregnant	2.07	1.00
If you carry too much mail at one time, your back will be sore	1.36	2.17
<i>Tips</i>		
* If you study more, your grades will improve	3.0	2.42
* If you study the section on international law, you will do well on the exam	3.21	1.67
* if you use a whitening toothpaste your teeth will be white	2.0	2.08
* If you show people more respect, you will find more friends	1.64	0.42
If you send her flowers, she will go out with you	4.0	1.83
If you take yoga classes, your tension will go away	2.21	2.92
If you take remedial lessons, you will understand the topic better	2.79	2.42
If you take these pills, your pain will go away	2.50	2.08
If you advertise the clinic, you will get more clients	2.71	1.67
If you show up early for work, you will impress your boss	1.86	1.92
If you buy a Ford, you will be satisfied with your purchase	1.71	1.25
If you go to Staples, you will find a reasonably priced laptop	1.79	1.92

The asterisked conditionals were used in Experiment 2.

one conditional and its four instances. The participants were tested in a group and the task took about 20 minutes.

Results and discussion

Most of the judgments about whether the sentences could all be true at the same time were yes (58% warnings, 59% tips), rather than no (21% in both cases), or it is not possible to say (18% warnings, 20% tips), as Figure 2 shows. We carried out a 2 (conditional: tips, warnings) \times 4 (instance: A B, not-A not-B, Not-A B, A not-B), ANOVA with repeated measures on both factors, on the judgments that the sentences could all be true at the same time. Participants were given a score of 1 if they said the assertions could all be true at the same time, and a score of 0 if they said they could not, or that it was not possible to say. The ANOVA shows a main effect of instance, $F(3,78) = 44.80$, $p < .001$, $\eta_p^2 = .63$, and no main effect of conditional, $F < 1$, and the two variables did not interact, $F < 1$ ¹.

For the A B instance, participants judged that the sentences could all be true on 88% of trials. Given advice such as “if you park too close to the fire hydrant, you will get a ticket” and the occurrence of both components—Warren parked too close to the fire hydrant, Warren got a ticket—they judged that all of the assertions could be true at the same time on 88% of trials, that they could not all be true on only 5% of trials, and that it was not possible to say on only 6% of trials, as Figure 2 shows.

For the not-A not-B instance, they judged that the sentences could all be true on 75% of trials. Given an advice conditional and the non-occurrence of both components—Warren did not park too close to the fire hydrant, Warren did not get a ticket—they judged that all of the assertions could be true at the same time on 75% of trials, that they could not be true on only 9% of trials, and that it was not possible to say on only 16% of trials. Notably this response is not consistent with the defective truth table (for which this instance is judged irrelevant rather than true). There was no difference in the tendency to judge that all the sentences could be true

at the same time for the A B vs. not-A not-B instances, $t(26) = 2.63$, $p < .014$, using a Bonferroni corrected alpha of $p < .008$ for the six comparisons carried out here.

For the not-A B instance, given the conditional and the instance associated with “alternatives”—Warren did not park too close to the fire hydrant, Warren got a ticket—participants judged that all of the assertions could be true at the same time on 36% of trials, that they could not all be true on 32% of trials, and that it is not possible to say on 30% of trials. This tendency is also not consistent with the defective truth table (for which this instance is irrelevant). They made the judgment that all of the assertions could be true at the same time for the A B and not-A not-B instances more than for the not-A B instance: A B vs. not-A B, $t(26) = 8.42$, $p < .001$, $d = 2.76$, and not-A not-B vs. not-A B, $t(26) = 7.01$, $p < .001$, $d = 1.76$.

For the A not-B instance, given the conditional and the instance associated with “disablers”—Warren parked too close to the fire hydrant, Warren did not get a ticket—participants judged that all of the assertions could be true at the same time on 37% of trials, that they could not all be true on 39% of trials, and that it was not possible to say on 24% of trials. This tendency is also not consistent with the defective truth table (for which this instance is false). They made the judgment that all of the assertions could be true at the same time for the A B and not-A not-B instances more than for the A not-B instance: A B vs. A not-B, $t(26) = 7.35$, $p < .001$, $d = 2.22$, and not-A not-B vs. A not-B, $t(26) = 6.39$, $p < .001$, $d = 1.45$. There was no difference between A not-B vs. not-A B, $t < 1$.

Next for each participant for each conditional we calculated the frequency of the 16 possible permutations of responses to the 4 instances, for example, a participant who chose “yes” to only the AB and not-A not-B instances was categorised as having a biconditional interpretation of that conditional, whereas a participant who chose “yes” to AB, not-A not-B, and not-A B was categorised as having a conditional interpretation of that conditional. Five interpretations occurred on more than 10% of trials for either tips or warnings, as Figure 3 shows, and there was no difference in their frequency for

¹The same results were found for an ANOVA of the same design on the judgments that the sentences could *not* all be true at the same time (in which participants were given a score of 1 if they said the assertions could not all be true, and a score of 0 if they said they could, or that it was not possible to say): a main effect of instance, $F(3,78) = 20.18$, $p < .0001$, $\eta_p^2 = .44$, no main effect of conditional, and the two variables did not interact, $F < 1$ in both cases. Similarly, the same results were found for an ANOVA on the judgments that it was not possible to say: a main effect of instance, $F(3,78) = 7.64$, $p < .0001$, $\eta_p^2 = .23$, and no main effect of conditional, and the two variables did not interact, $F < 1$ in both cases.

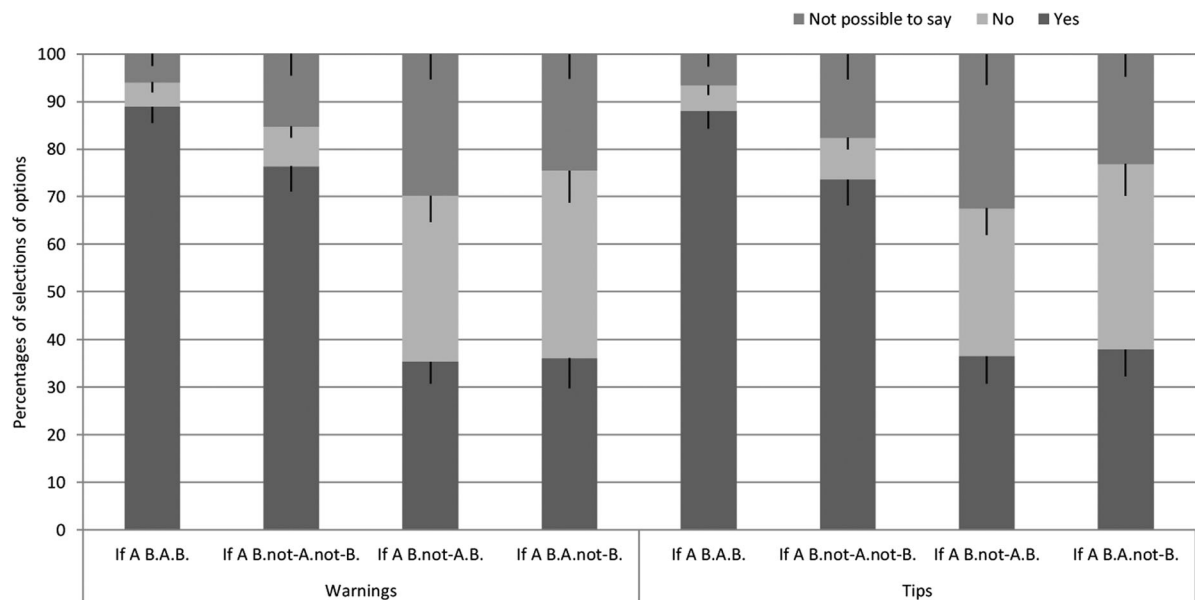


Figure 2. The percentages of judgments that the sentences could all be true at the same time (yes), or they could not (no), or that it is not possible to say in Experiment 1. Error bars are standard error of the mean.

warnings and tips: (a) the most frequent interpretation was the biconditional, “yes” to AB, and not-A and not-B, which occurred on more than one-third of trials, warnings 36%, tips, 29%, $t(26) = 1.29$, $p < .21$; the other four interpretations occurred on about 10–15% of trials each, (b) the conditional interpretation, “yes” to AB, not-A and not-B, and not-A B, warnings 14% vs. tips 12%, $t < 1$, (c) the enabler interpretation, that is, “yes” to AB, not-A and not-B, and A not-B, 7% warnings, 11% tips, $t(26) = 1.33$, $p < .195$, (d) a tautology interpretation, that is, “yes” to all four instances, 13% warnings, 15% tips, $t < 1$, and (e) a defective interpretation, that is, “yes” to only AB, 8% warnings, 13% tips, $t(26) = 1.16$,

$p < .26$. (We note that this categorisation is a generous one for the defective interpretation, including “not possible to say” and “no” responses to A not-B, not-A and not-B, and not-A B to maximise the frequency of detecting such potential interpretations). Each of the remaining 11 interpretations occurred on fewer than 3% of trials.

The experiment shows that participants’ interpretation of advice conditionals correspond to a biconditional interpretation on about one-third of trials, the next most common interpretations were the conditional, tautology, and enabling ones. The defective interpretation occurred on only 10% of trials.

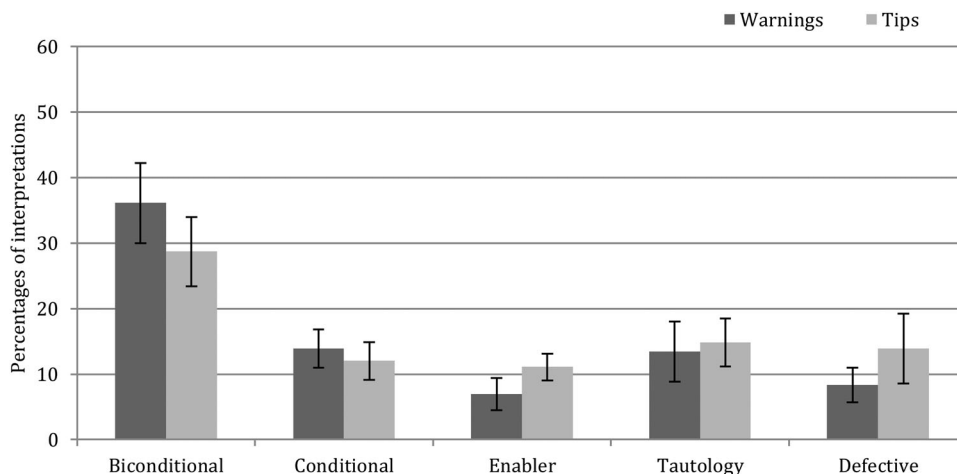


Figure 3. The percentages of five interpretations in Experiment 1. Error bars are standard error of the mean.

On about half of trials, participants came to interpretations, such as the biconditional or conditional interpretations, that would enable them to endorse inferences such as the modus ponens inference, for example:

Warren's girlfriend points out that "if you park too close to the fire hydrant, you will get a ticket".

Warren parked too close to the fire hydrant.

Therefore, Warren got a ticket.

But on other trials, participants came to interpretations such as the enabling interpretation or the tautology one that would suppress even the simplest modus ponens inference. Our next experiment examines whether participants make such inferences from advice conditionals.

Experiment 2

The aim of the experiment was to compare the frequency of modus ponens and tollens inferences that people make from tips vs. warnings. Participants were given a conditional in a sensible context, for example,

Warren is driving to town with his girlfriend, and he is trying to find a place to park. His girlfriend points out that "if you park too close to the fire hydrant, you will get a ticket".

They were given the additional information for the modus ponens inference:

Warren parked too close to the fire hydrant.

Their task was as follows:

What can you conclude?

- (a) Warren got a ticket.
- (b) Warren did not get a ticket.
- (c) Warren may or may not have got a ticket.

We focused on the modus ponens and tollens inferences to examine the relative frequency of these inferences from tips and warnings.

Method

Participants

The participants were 45 students in their final year of second level education at the high school Escola Secundária Cidadela, Cascais. There were 18

women and 27 men, and their ages ranged from 16 to 20, with a mean age of 18 years.

Materials

Every participant received 4 conditionals, either 4 tips or 4 warnings, selected from the pool of 24 conditionals used in the previous experiment (see the Appendix), based on the materials test in the previous experiment (see Table 3). They received a conditional of the form "if A then B" and a minor premise, for example, "A", and their task was to select a conclusion from a set of conclusions, which included the usual conclusion, for example, "B", the opposite of the usual conclusion, for example, "not-B", and the option, "B may or may not occur". From the set of 12 warnings, we selected four conditionals to include a conditional that could be interpreted as a biconditional, that is, one with few disablers and few alternatives (If you close the railway line, many people will move to a bigger city), one that could be interpreted as conditional, that is, one with many alternatives and few disablers (If you park too close to the fire hydrant, you will get a ticket), one that could be interpreted as an enabling interpretation, that is, one with many disablers and few alternatives (If you wander away from me, you will get lost), and one that could be interpreted as a tautology, with many disablers and many alternatives (If you stop exercising, you will gain weight). Likewise from the set of 12 tips we selected four conditionals to include one with few disablers and few alternatives (if you show people more respect, you will find more friends), one with many alternatives and few disablers (if you use a whitening tooth paste your teeth will be whiter), one with many disablers and few alternatives (If you study the section on international law, you will do well on the exam), and one with many disablers and many alternatives (If you study more, your grades will improve).

Materials Test: We checked that people distinguished between the valence of the outcome for the four selected tips and four warnings, since valence is an important distinguishing feature between tips and warnings (e.g. Haigh et al., 2011; López-Rousseau & Ketelaar, 2004). A new set of 175 participants took part in the materials check. They were 139 women and 36 men, whose ages ranged from 18 to 70 years, with an average age of 30 years. Participants indicated whether the outcome was good or bad for 12 conditionals, the 4 selected tips and 4 selected warnings and also 4

causal conditionals. The conditionals were presented in a different randomised order to each participant. The participants provided their responses on a Likert-type scale anchored at 1 (very negative) and 5 (very positive). The materials were presented online using SurveyGizmo software. Participants received an invitation via email or Facebook to participate in the experiment and were encouraged to share the link with others. A one-way repeated measures ANOVA (tips, warnings, causes) on the judgments of the valence of the outcome showed a main effect, $F(2, 348) = 443.3, p < .001, \eta_p^2 = .72$. Participants judged the tips, $M = 4.01, SD = .50$, to have a more positive outcome than the warnings, $M = 2.38, SD = .71, t(174) = 22.62, p < .001, d = 2.69$; they also judged the tips to have a more positive outcome than the causal conditionals, $M = 3.63, SD = .552, t(174) = -6.9, p < .001, d = .72$, and they judged the warnings to have a more negative outcome than the causal conditionals, $t(174) = 30.251, p < .001, d = 1.997$.

Design and procedure

The 45 participants who took part in the experiment proper acted as their own controls and received both sorts of conditionals, tips and warnings, and both sorts of inferences, modus ponens and tollens. The design was thus a 2 (conditional type: tips, warnings) \times 2 (inference: modus ponens and tollens) within participants design. They were given 8 conditionals, 4 warnings and 4 tips. They completed two inferences, modus ponens and tollens, for each conditional, and so they completed 16 inferences in total, in a different randomised order for each participant.

The participants were tested in groups and they carried out several tasks.² The inferences were presented in a booklet. They were instructed by way of an example to choose only one conclusion for each inference. The experiment took about 20 minutes.

Results and discussion

Most of the inferences endorsed the usual conclusion, for example, given "A", the conclusion selected was "B" (32% warnings, 39% tips), or to say

that it may or may occur, for example, given "A", the conclusion selected was "B may or may not occur" (66% warnings, 58% tips), very few inferences endorsed the opposite of the conclusion, for example, given "A", the conclusion selected was "not-B" (2% warnings, 3% tips), as Figure 4 shows. We carried out a 2 (conditional: tips vs. warnings) \times 2 (inference: MP vs. MT) ANOVA with repeated measures on both factors, on the frequency of endorsements of the usual conclusion. It showed a main effect of conditional, $F(1,44) = 4.62, p < .037, \eta_p^2 = .095$, as participants made more inferences from tips than from warnings, no main effect of inference, $F < 1$, and an interaction of the two variables, $F(1,44) = 7.04, p < .011, \eta_p^2 = .14$, as Figure 5 shows.³

We decomposed the interaction with four comparisons using a Bonferroni corrected alpha of $p < .0125$. It arises because participants made more modus ponens from tips than warnings, $t(44) = 3.89, p < .001, d = 1.95$, but not more modus tollens, $t < 1$; there were no differences between modus ponens and tollens from tips, $t(44) = 2.002, p < .052$, or warnings $t < 1$.

The results show that participants made very few inferences from tips and warnings, consistent with previous research (e.g. Newstead et al., 1997; Ohm & Thompson, 2004). Participants made the inferences on only about one-third of trials for tips and warnings. They made more inferences from tips than warnings, in particular, they made more modus ponens inferences from tips than from warnings. The experiment shows that the availability of counterexamples has a major impact on the inferences people are willing to make from advice. For example, when participants were told about a mother who gives her child the warning, "If you wander away from me, you will get lost", and they heard that the child wandered away, they were rarely willing to endorse the conclusion, the child got lost. The usual modus ponens and tollens inferences from tips and warnings are suppressed and instead participants tend to conclude from the information that the action occurs, that the tipped or warned outcome may or may not occur, and from the information that the tipped or warned outcome did not occur, that the action advised to lead to it may or may not have occurred.

²Participants carried out the Need for Cognition scale (Cacioppo & Petty, 1982), half of the participants did so after they completed the inference task and the other half before they completed the inference task. They did not differ on this scale and so we do not report the results further.

³The same results were found for an ANOVA of the same design on the selection of the "may or may not occur" option: a main effect of conditional, $F(1,44) = 7.74, p < .008, \eta_p^2 = .150$, no main effect of inference, $F < 1$, and an interaction of the two variables, $F(1,44) = 4.84, p < .033, \eta_p^2 = .099$. There were too few inferences of the opposite of the usual conclusion to warrant an analysis as Figure 4 shows.

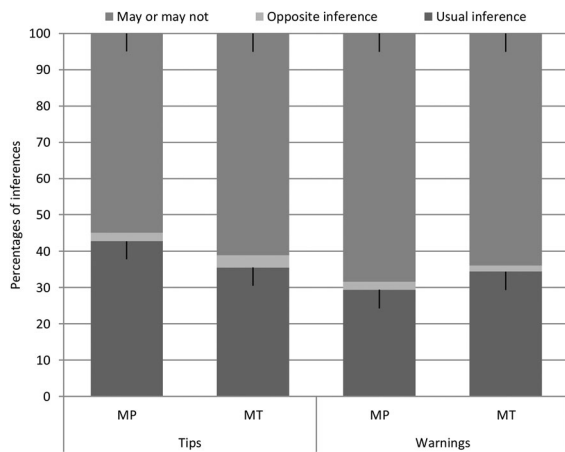


Figure 4. The percentages of responses to MP and MT inferences for tips and warnings that correspond to the endorsement of the usual inference, the endorsement of the opposite of the usual inference, or the conclusion “may or may not occur” in Experiment 2. Error bars are standard error of the mean.

General discussion

How do people understand a warning such as “if we do not act boldly, cities will be submerged” or a tip such as “if you quit smoking, your health will improve”? When they are given a novel “collective” truth table task, for example,

If you quit smoking, your health will improve. You quit smoking. Your health does not improve. Could all of these assertions be true at the same time?

their judgments reveal important characteristics of their interpretations of advice. People judge that a tip such as “if you quit smoking, your health will

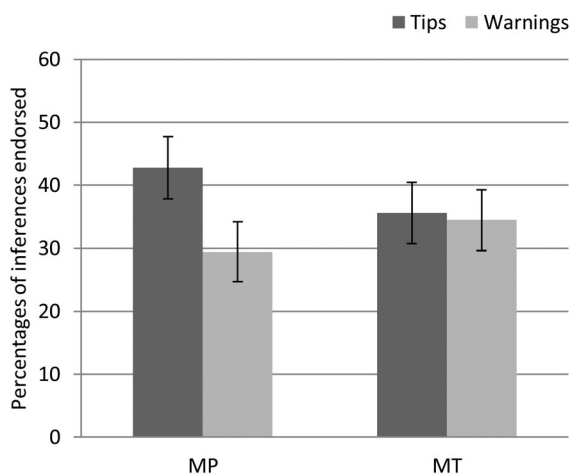


Figure 5. The percentages of MP and MT inferences endorsed for tips and warnings in Experiment 2. Error bars are standard error of the mean.

improve” is consistent with the occurrence of the advised action and outcome, and their non-occurrence:

You quit smoking and your health improves.

You do not quit smoking and your health does not improve.

They very often judge that the sentences could all be true in both of these cases. But they can readily create counterexamples to advice conditionals, as the materials test of a range of such conditional tips and warnings showed. Hence, in some cases their judgment is that a conditional tip or warning is also consistent with the non-occurrence of the advised action and the outcome, for example,

You quit smoking and your health improves.

You do not quit smoking and your health does not improve.

You do not quit smoking and your health improves.

because they have thought of alternatives, for example, they change to a low tar brand, or they take more exercise. In other cases their judgment is that such advice is consistent with the occurrence of the advised action and the non-occurrence of the outcome, for example,

You quit smoking and your health improves.

You do not quit smoking and your health does not improve.

You quit smoking and your health does not improve.

because they have thought of disablers, for example, the damage to health may have already been done. And in some cases their judgment is that the advice is consistent with all four possibilities,

You quit smoking and your health improves.

You do not quit smoking and your health does not improve.

You do not quit smoking and your health improves.

You quit smoking and your health does not improve.

because they have thought of both sorts of counterexamples.

The interpretations that people come to of advice conditionals affect the inferences they make from them. People make very few inferences from tips

and warnings, as Experiment 2 showed. The modus ponens and tollens inferences were suppressed for tips and warnings. Given a tip such as “if you quit smoking, your health will improve” people appear to be reluctant to make the modus ponens inference from the information that the action occurred “you quit smoking” to the good outcome “your health improves”. This suppression of modus ponens indicates that people may consider that not even the simplest conclusions can be drawn from advice. These results shed some light on alternative views about the cognitive processes that underlie reasoning about advice.

Alternative views of reasoning

People may understand a conditional by envisaging the *possibilities* with which it is consistent. This account can be extended to apply to advice conditionals such as a tip “if you dress well you will impress your boss” or a warning “if you tease the dog it will bite you”. People construct a single “initial” possibility, for example, “he dresses well and he impresses his boss” and they think about as few possibilities as they can because of the limitations of working memory (e.g. Barrouillet et al., 2008; Espino & Byrne 2013; Johnson-Laird & Byrne, 2002). Their interpretation differs from a conjunction because they can make a “mental note” that there may be alternatives, and “flesh out” the representation further (e.g. Johnson-Laird & Byrne, 1991). They represent only true possibilities, and not possibilities ruled out as false (e.g. Barrouillet & Lecas, 1999; Espino & Byrne, 2012; Espino, Santamaria, & Byrne, 2009). They think about possibilities and not about truth and so their mental representations differ from entries in a “truth table” (Wittgenstein, 1953). Some inferences such as modus ponens may be made on the basis of the initial possibility whereas others such as modus tollens require effortful processes, such as the construction of alternative possibilities (e.g. Johnson-Laird, 2006; Stanovich 1999). Content and context can eliminate potential possibilities from consideration (e.g. Byrne & Johnson-Laird, 2009; Quelhas et al., 2010). This account can explain the results of the experiments reported here that people rarely make inferences from advice conditionals, because it proposes that the counterexamples people retrieve suppress inferences by making readily available a possibility that contradicts a putative conclusion (e.g. Juhos, Quelhas, & Byrne, 2015).

An alternative view is that the probability of a conditional “if A then B” is the conditional probability, that is, the probability of B given A: *Probability (B|A)* (e.g. Evans & Over, 2004; Oaksford & Chater, 2007). A valid inference is one in which the uncertainty of its conclusion does not exceed the sum of the uncertainties of its premises (e.g. Ali, Chater, & Oaksford, 2011; Over et al., 2007). This account could be extended to account for advice conditionals by proposing that participants calculate the probability of an advised action and its tipped or warned outcome, and the relation between them, based on their prior beliefs or knowledge about base rates. On this account, suppression is explained as increasing uncertainty in the conclusion (e.g. Stevenson & Over, 1995). It occurs because an alternative or disabler changes the probability of the outcome occurring without the advised action (e.g. Ali et al., 2011). This account could explain the results from the experiments reported here that people rarely make inferences from advice conditionals, because it could propose that the probability of the tipped or warned outcome given the probability of its advised action is low. However, it may have some difficulty in explaining the absence of the “defective truth table” interpretation of tips and warnings.

Overall, the results of these experiments show that people can readily generate counterexamples to tips and warnings, they sometimes consider them to be consistent with all possible situations, and they rarely make the main conditional inferences from them. People often give each other advice, conveying a wish to change the behaviour of their hearer, to try to get the hearer to carry out the action mentioned in a tip, and to not carry out the action mentioned in a warning. Yet the findings of the experiments reported here suggest that tips and warnings may be somewhat ineffective in achieving the goal of influencing the behaviour of others. Of course, in the experiments participants judged examples of people giving advice to other people. It remains to be examined whether participants make different sorts of interpretations and different inferences when the advice is personally relevant to them and is designed to change their own behaviour.

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Appendix

The first ten conditionals in each set were adapted from Ohm and Thompson (2004) and the last two are new items. The sentences were translated to Portuguese (provided underneath each sentence) and Portuguese names were used. The conditionals used in Experiment 2 are marked with an asterisk.

Warnings

* Verónica and her mother are shopping in a very crowded shopping mall. Her mother tells Verónica “If you wander away from me, you will get lost”.

A Verónica e a mãe estão a fazer compras num centro comercial muito movimentado. A mãe diz à Verónica: “Se te afastares de mim, então perder-te-ás”.

* At a local council meeting, politicians are discussing the proposed plan to close the railway line. One politician makes the point that “If you close the railway line, many people will move to a bigger city”.

Numa reunião de concelho local, os políticos discutem uma proposta para fechar a linha de caminhos de ferros. Um dos políticos diz: “Se a linha for fechada, então muitas pessoas mudar-se-ão para cidades maiores”.

* Carlos is driving to town with his girlfriend, and he is trying to find a place to park. His girlfriend points out that “If you park too close to the fire hydrant, you will get a ticket”.

O Carlos vai a conduzir com a namorada ao lado e está a tentar arranjar um lugar para estacionar. A namorada diz-lhe: “Se estacionares demasiado próximo da boca de incêndio, então serás multado”.

* Irene has recently been very busy at work. As a result, she has stopped going to the gym. Her friend tells her “If you stop exercising, you will gain weight”.

Recentemente a Irene tem tido muito trabalho, por causa disso parou de ir ao ginásio. Uma amiga diz-lhe: “Se deixares de fazer exercício, então ganharás peso”.

Simão is a young salesperson in a new job. He has been wearing clothes that are less formal than the other employees. An older colleague has recently told Simão: “If you wear jeans to work, you will be fired”.

O Simão é um jovem vendedor com um emprego novo. Tem usado roupas menos formais que as dos seus colegas. Um colega mais velho disse-lhe recentemente: “Se usares calças de ganga para vir trabalhar, então serás despedido”.

Rui has just started a new job as a mailman. His colleague tells him “If you carry too much mail at one time, your back will be sore”.

O Rui tem um novo emprego como carteiro. Um colega diz-lhe: “Se carregares demasiado correio de uma só vez, então ficarás com dores nas costas”.

A basketball player is suffering from a loss of form. One of his teammates tells him “If you continue missing shots, you will be dropped from the team”.

Um jogador de basketball está em baixo de forma. Um dos seus colegas de equipa diz-lhe: “Se continuares a falhar cestos, então serás dispensado da equipa”.

Mário is playing with the family’s new puppy. His father says to him “If you tease the dog, it will bite you”.

O Mário está a brincar com o novo cão da família. O Pai diz-lhe: “Se provocares o cão, então ele morder-te-á”.

Ricardo is planning to move to a bigger city. His friend tells him “If you find an apartment close to the freeway, the traffic will annoy you”.

O Ricardo planeia mudar-se para uma cidade maior. Um amigo diz-lhe: “Se alugares um apartamento perto da auto-estrada, então o trânsito incomodar-te-á”.

The drummer in a band is not showing up for practice. The other band members are discussing what to do with him. The bass player tells the others “If we fire the drummer, we will have to cancel the next show”.

O baterista de uma banda não aparece no ensaio. Os outros membros da banda discutem o que fazer quanto a ele. O baixista diz aos outros: “Se despedirmos o baterista, então teremos que cancelar o próximo espetáculo”.

Ana is complaining to her mother that she has a headache. Her mother tells her “if you put your glasses to read you will feel better”.

A Ana queixa-se de dores de cabeça à Mãe. A Mãe diz-lhe: “Se puseres os óculos para ler, então sentir-te-ás melhor”.

In a 12th grade biology class the teacher tells the female students “if you have unprotected sex, you will get pregnant”.

Numa aula de biologia de 12º ano, a professora diz às alunas: “Se tiverem relações sexuais desprotegidas, então irão engravidar”.

Tips

* Ricardo has recently encountered problems at school. He is falling behind his classmates in a few courses. While talking to his mother, Ricardo is told “If you study more, your grades will improve”.

O Ricardo está com problemas na escola. Está a ficar atrasado em relação aos colegas em algumas disciplinas. Em conversa com a Mãe, esta diz-lhe: “Se estudares mais, então as tuas notas irão melhorar”.

* Catarina feels that she has few friends in her life. She is discussing ways to find new friends with her mother. Her mother tells Catarina “If you show people more respect, you will make more friends”.

A Catarina sente que tem poucos amigos. Está a falar com a Mãe sobre maneiras de conseguir mais amigos. A Mãe diz-lhe: “Se mostrares mais respeito às pessoas, então encontrarás mais amigos”.

* Several law students have decided to ask the professor, Dr Ferreira, about the upcoming exam. When asked what to read, Dr Ferreira says “If you study the section on international law, you will do well on the exam”.

Vários alunos de direito decidiram perguntar ao professor, o Doutor Ferreira acerca do próximo exame. Quando lhe perguntaram o que deveriam ler, o professor Ferreira disse: “Se estudarem a secção sobre direito internacional, então sair-se-ão bem no exame”.

* Rita would like to have whiter teeth. Her dentist tells her "if you use a whitening tooth paste your teeth will be whiter".

A Rita quer ter os dentes mais brancos. O dentista diz-lhe: "Se usar uma pasta de dentes branqueadora, então os seus dentes ficarão mais brancos".

Paula has recently found a new job. While talking to her friend, she is told "If you show up early for work, you will impress your boss".

A Paula tem um emprego novo. Uma amiga diz-lhe: "Se chegares cedo ao emprego, então impressionarás positivamente o teu patrão".

Maria is thinking of buying a car. Her friend tells her "If you buy a Ford, you will be satisfied with your purchase".

A Maria está a pensar trocar de carro. Um amigo diz-lhe: "Se comprares um Ford, então ficarás satisfeita com a compra".

Mónica has decided to buy a laptop computer that will help her with her studies. Her boyfriend tells her "If you go to Staples, you will find a reasonably priced laptop".

A Mónica decidiu comprar um computador portátil o que a irá ajudar com os estudos. O namorado diz-lhe: "Se fores à Worten, então encontrarás um computador a um preço razoável".

Paulo is very eager to ask a girl out on a date, but does not know if she wants to. So Paulo asks his friend's opinion, who replies by saying "If you send her flowers, she will go out with you".

O Paulo quer muito convidar uma rapariga para sair com ele mas não sabe se ela quer por isso pede a opinião a um

amigo que lhe diz: "Se lhe enviases flores, então ela sairá contigo".

Joana is feeling stressed. When hearing this, her brother suggests "If you take yoga classes, your tension will go away".

A Joana anda a sentir-se tensa. Quando ouve isto, o irmão sugere: "Se fizeres umas aulas de yoga, então a tensão desaparecerá".

Sérgio is having problems with his math homework. When he tells his father about these problems, his father says "If you take remedial lessons, you will understand the topic better".

O Sérgio está a ter problemas com os trabalhos de casa de matemática. Quando fala com o Pai sobre estes problemas o Pai diz-lhe: "Se tiveres lições de apoio, então compreenderás melhor esse tópico".

Vitória is seeing her doctor for the pain she has experienced lately. Her doctor says "If you take these pills, your pain will go away".

A Vitória vai ao médico por causa de uma dor que anda a sentir ultimamente. O médico diz-lhe: "Se tomar este comprimidos, então a dor desaparecerá".

João just opened a new clinic and he needs more clients. His associates tell him "If you advertise the clinic, you will get more clients".

O João abriu recentemente uma clinica e precisa de mais clientes. Os seus sócios dizem-lhe: "Se publicitares a clinica, então conseguirás mais clientes".