'You Do It Like This!': Impersonal Pronouns and Default Reasoning[1]

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Abstract: We explore impersonal pronouns in sentences like 'You do it like this.' Two experiments show that people tend to interpret sentences like this as communicating information about what people usually do and information about what people ought to do. A similar statistical/prescriptive mixture has been observed in existing research about other phenomena (modality, normality, and genericity). Findings from this existing research suggest that all of these other phenomena involve a default mode of reasoning. We suggest that some uses of impersonal pronouns may involve the application of this default reasoning to questions about actions.

0. Introduction

Imagine that you are trying to figure out how to use the coffee machine and that you therefore ask a coworker for some information. One way for her to respond would be by making a purely *statistical* claim. For example, she could say:

(1) People usually do it like this.

Another way for her to respond would be by making a purely *prescriptive* claim. For example:

(2) The best way to do it is like this.

But now suppose instead that she simply responds by using sentence (3a) or the more colloquial (3b).

(3) a. One does it like this.
b. You do it like this.

These sentences are more puzzling. On one hand, they seem to be making a statistical claim of some sort, saying that a certain way of behaving is frequent or common. Yet, on the other hand, they also seem to be making a prescriptive claim, saying that a certain way of behaving is good or right. Our aim here is to develop a better understanding of the mix of statistical and prescriptive claims in sentences like these.

Expressions like 'one' and 'you' are known as *impersonal pronouns*. The study of impersonal pronouns raises numerous difficult questions in both syntax and semantics, but we will not attempt to provide a more general theory that addresses all of these questions. Instead, we will be focusing on a narrow but important subset of sentences

[1] For comments on a previous draft, we are grateful to Adam Bear, Fiery Cushman, Jonathan Phillips and Philippe Schlenker.

involving impersonal pronouns (which we will call *'man' sentences,* as we will focus on the German impersonal pronoun 'man'): namely, certain uses which are used to convey a mix of statistical and prescriptive information.

To see why this is just a small part of the larger topic, we can contrast different kinds of sentences that use impersonal pronouns. Sentences (4a-c) all show the mix of statistical and prescriptive that we aim to understand here.

(4) a. At a Jewish funeral, you wear a kippah.
b. To compare two means, you use a t-test.
c. How do you drive a stick shift?

However, there are also various sentences with impersonal pronouns that do not show this mix of statistical and prescriptive. For example, consider sentences with modals (5a), conditionals (5b), or in which the impersonal pronoun is co-indexed with PRO (5c).

(5) a. You can see the Eiffel Tower from here.
b. If you are falling toward the earth in a vacuum, you will usually accelerate at 32 ft/sec/sec.
c. It is very difficult PRO to dance gracefully while holding one's dog.

It is not clear that sentences like this have any particularly prescriptive meaning. Conversely, suppose that, after reading the greatest novel ever written, a speaker says:

(6) Now *that's* how you write a novel.

This sentence commends or praises a type of behavior but makes no statistical claim.

In the present paper, our aim is relatively narrow: namely, to explore the use of impersonal pronouns in sentences that communicate both statistical and prescriptive information, as in (4).[2] While this topic is narrow, we believe it touches on deep questions about human cognition. The reason for this is that the characteristic blend of prescriptive and descriptive information that we find in our target cases has also been found in judgments about generics, modality, and normality. We will suggest that our target phenomenon may form a natural class with these other ones, in that all represent something like a *default mode of reasoning*: while certain generics express people's default way of making generalizations about categories (Leslie 2008), certain modals express people's default way of thinking about possibilities (Phillips 2018), and certain normality claims express default reasoning about something like scales (Bear & Knobe 2017), we will suggest that certain uses of impersonal pronouns can express people's default way of reasoning about actions.

[2] We focus in particular on impersonal pronouns in English and German. There is cross-linguistic variation in how impersonal pronouns are realized (see Egerland 2003 for some discussion). We will not attempt a cross-linguistic survey here, but our hope is that we will be identifying something cognitively basic, even if there are differences across languages in how it is expressed.

1. Study 1: The basic phenomenon

We begin by reporting the results of a study that provides evidence for the basic empirical claim that motivates our entire inquiry: namely, that there are uses of impersonal pronouns which convey both statistical and prescriptive content.

Participants in the study provided ratings for a series of sentences. Some sentences clearly had statistical content as their core meaning, while others clearly had prescriptive content as their core meaning. Most importantly, one was a sentence with an impersonal pronoun. This design allowed us to test the hypothesis that the sentence with an impersonal pronoun was seen as more *prescriptive* than the clearly statistical sentences but also more *statistical* than the clearly prescriptive sentences.

In English, the impersonal pronoun 'one' seems a bit too formal in register to naturally include in an experiment, while the pronoun 'you' is ambiguous (having both an impersonal sense and a second-person sense). Thus, if we stick with English, we face a choice between excessive formality and ambiguity. To get around these difficulties, we ran the study in German, where the impersonal pronoun *man* is neither formal nor ambiguous.

Method

Participants. We aimed to recruit at least 360 participants who had sufficient knowledge of German and showed a necessary amount of attention. We first sampled 401 participants from Clickworker. Of these 2% did not indicate German as their native language and 51% failed the attention check. We then recruited a second sample of 393 participants of which 1% did not indicate German as their native language and 57% failed the attention check. Repeated participation was ruled out. The total sample thus consisted of 794 participants (51% female, M = 36.9 years old, SD=12.1 years, 90.8% Caucasian). Excluding all participants who failed the attention check or did not speak German as their native language, we were left with 365 participants (54% female, M=38.51 years old, SD=12.3 years). Participants were paid $0.30 or $0.50 for the first and second sample respectively.

Materials and procedure. All participants received the same introductory story frame (the original German wording can be found in the appendix).

> Frank and Thomas are from a region in which people trall. What exactly tralling is, is not relevant to this study. However, you can be sure that Frank and Thomas know what tralling is. Frank and Thomas now travel to a country which Thomas has never visited before: Daxland.

Every participant then received five statements that Frank could make about tralling (in random order). Two contained an overtly prescriptive message:

[*Should*] 'You should not trall in Daxland.'

[*Improper*] 'It is improper to trall in Daxland.'

Two contained an overtly statistical message:

[*Few*] 'There are only a few people who trall in Daxland.'

[*Average*] 'On average, there is no tralling in Daxland.'

Finally, one contained a sentence with an impersonal pronoun.

[*Man*] 'In Daxland, one [*man*] does not trall.'

Note that the sentences are translated above in a very literal fashion; although these sentences may seem a bit stilted in English, they are perfectly idiomatic in the original German.

Each participant was randomly assigned a single question to answer regarding all five statements. For each of the five statements, some participants were asked whether they agreed with one of the following prescriptive claims:

[*Offense*] 'If Thomas tralled in Daxland, he would cause offense.'

[*Warning*] 'Frank wants to warn Thomas not to trall.'

[*Accusations*] 'If Thomas tralls in Daxland, the Daxlanders will make accusations against him.'

Some were asked whether they agreed with one of the following statistical claims:

[*Proportion*] 'Frank wants to inform Thomas about the proportion of Daxlanders who trall.'

[*How many*]: 'This sentence states how many Daxlanders do indeed trall.'

[*Verifiable*]: 'This sentence is statistically verifiable.'

Participants rated the degree to which the statistical or prescriptive claim they received matched each of the five statements. Ratings were expressed on a seven-point Likert Scale, ranging from 'strongly oppose' (1) to 'strongly agree' (7).

The last page of the experiment consisted of demographic questions, but also included an attention check that consisted of the following question: 'To confirm that you are not a robot and read the questions carefully, please give two as the answer to the following

question. How much is 4+2?' Participants answered this question on a horizontal scale ranging from 1 to 7.

Results

Means and standard deviations for each question regarding each statement are presented in Table 1. To analyze these data, we ran paired sample t-tests comparing answers to each question regarding the 'man' sentence to answers to the same question regarding each of the clearly prescriptive statements and each of the clearly statistical statements.[3] (The t- and p-values of those tests are displayed in Table 2 in the appendix. Data and R code for all experiments in this paper are available at: https://osf.io/6f2nc/)

Table 1. Means and standard deviations (in parentheses) for each question (columns) regarding each statement
(rows). Significance levels for the t-tests are displayed with asterisks (* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$).

Condition		Prescriptive Questions			Statistical Questions		
		Offense	Warning	Accusations	Proportion	How Many	Verifiable
Prescriptive Statements	Should	5.73 (1.31)	6.02* (1.55)	5.34 (1.55)	2.02*** (1.43)	2.43*** (1.65)	2.89*** (1.86)
	Improper	6.14** (1.21)	6.07** (1.17)	5.8 (1.57)	2.84** (1.94)	2.95* (2.08)	3.48*** (1.88)
Statistical Statements	Few	3.54*** (1.61)	3.16*** (1.74)	3.3*** (1.53)	5.89*** (1.66)	4.62* (2.12)	5.32 (1.58)
	Average	3.69*** (1.48)	3.47*** (1.6)	3.36*** (1.38)	5.21*** (1.54)	4.1 (1.88)	4.9 (1.99)
Impersonal Statement	Man	5.36 (1.42)	5.59 (1.27)	5.48 (1.51)	3.84 (2.11)	3.8 (2.3)	4.82 (1.82)

[3] We preregistered analyses for this study (https://aspredicted.org/58n49.pdf). However we misremembered the design, mistakenly thinking that the different questions were presented within-subject, and preregistered analyses that would only make sense in that other design. We regret the error.

First, we can ask whether the 'man' sentence is rated as more prescriptive than any of the statistical statements and also as more statistical than any of the prescriptive statements. As Table 1 shows, the 'man' sentence received higher ratings on all of the prescriptive questions than any of the statistical statements did. Similarly, the 'man' sentence received higher ratings on all of the statistical questions than any of the prescriptive statements did.

Secondly, we can ask whether the 'man' sentence is rated as less statistical than any of the statistical statements and also as less prescriptive than any of the prescriptive statements. The pattern of those results is not as clear. In some cases, the 'man' sentence was rated as less prescriptive than the clearly prescriptive statements or less statistical than the clearly statistical statements. In others, however, there was no significant difference.

To get a better intuitive grasp of those results, we can treat the mean of the three prescriptive questions as a measure of prescriptivity and the mean of the three statistical questions as a measure of statisticality. We can then ask how each of the five statements stands overall on prescriptivity and statisticality. Figure 1 shows those results. The two prescriptive statements are in the top left, showing high values on prescriptivity and low values on statisticality. The two descriptive statements are in the bottom right, showing low values on statisticality and high values on statisticality. The 'man' sentence is in the upper right. Overall, it was almost as prescriptive as the clearly prescriptive statements and almost as statistical as the clearly statistical statements.

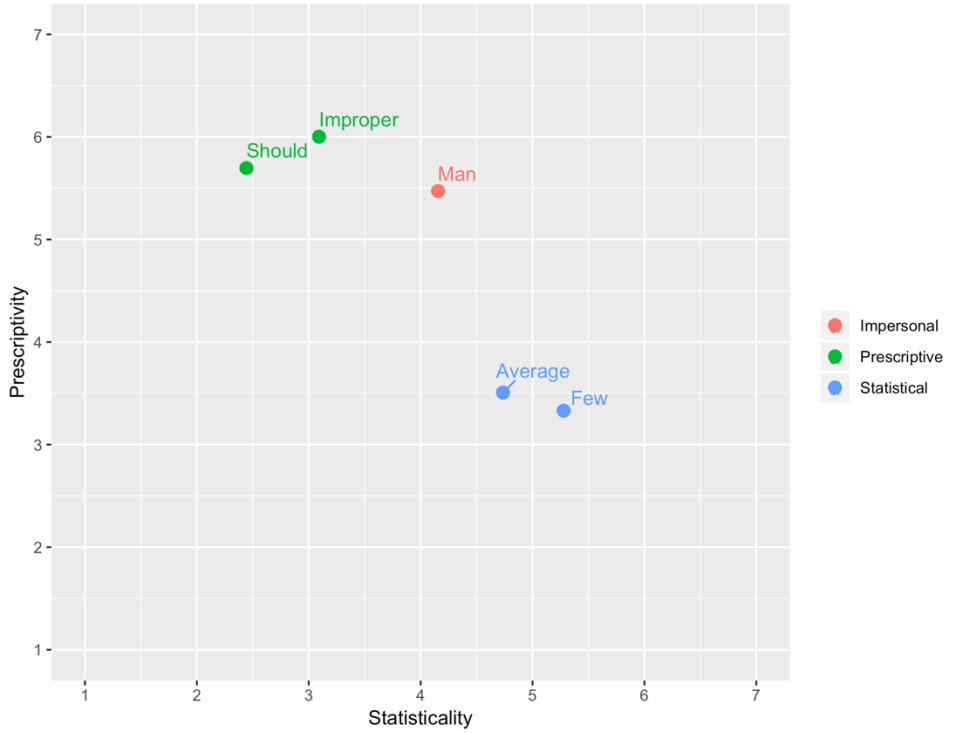

Figure 1. Mean scores from statistical questions (x-axis) and prescriptive questions (y-axis) for each statement.

Discussion

This first experiment explored people's intuitions about sentences that use impersonal pronouns. We wanted to know whether people interpreted these sentences as conveying statistical content and also whether they interpreted these sentences as conveying prescriptive content. Strikingly, the results suggest that people interpret such sentences as conveying content of both types. In other words, when a speaker uses a sentence with an impersonal pronoun in a context like the one in our experiment, people interpret that sentence both as conveying an opinion about what is typically done (statistical) and as conveying an opinion about what ought to be done (prescriptive).

2. Default reasoning

If we look beyond 'man' sentences, we find a number of other phenomena that also involve a mixture of statistical and prescriptive considerations. Specifically, recent research has identified a statistical/prescriptive mixture in three other phenomena: modals, normality, and generics.

These three phenomena are very different from each other, and all three are very different from 'man' sentences. But we think that drawing out the connections between

these different domains, and their connection to 'man' sentences, can shed light on what is going on across these different domains. In particular, existing research suggests that each of these other phenomena can express a *default mode* of reasoning. In other words, in all three cases, people are capable of thinking in a purely statistical way or in a purely prescriptive way, but these ways of thinking are not people's default. Their default is to engage in a kind of reasoning that mixes together the statistical and the prescriptive. Each of the three phenomena can then be understood in part as expressing the application of a default mode of reasoning to a particular subject matter. Modal language can express people's default mode of reasoning about possibilities; claims about normality can express default reasoning about degrees on scales; and generics can express default reasoning about categories. In the rest of this section, we will give a very brief overview of existing research on each of these phenomena, drawing out lessons which may help us arrive at a better understanding of 'man' sentences.

2.1 Modality

Modals are expressions such as 'can,' 'must,' and 'have to' that are used to express claims about possibilities. Within existing research, it has long been recognized that the interpretation of sentences using these constructions depends in part on conversational context (e.g., Kratzer 1977,1981). Thus, there will be contexts in which prescriptive considerations play a role in the interpretation of modals, but also contexts in which they do not. Similarly, there will be contexts in which statistical considerations play a role and also contexts in which they do not.

As an example, consider the question:

(7) Can we get to the game by car in five minutes?

On one interpretation, this question does not have anything to do with whether it is at all statistically probable that one would be able to get to the game in five minutes but is simply about whether doing so is physically possible. Thus, on this first interpretation, if there is any possibility in which one gets to the game that quickly (even one that involves freak quantum-mechanical accidents), the correct answer is 'Yes.' By contrast, on a second interpretation, the modal in this sentence only quantifies over possibilities that have at least a certain level of statistical probability. Hence, on this second interpretation, if there is no way to get to that game unless something extremely improbable occurs, the correct answer would be 'No.'

Similar points apply to the role of prescriptive considerations. On one interpretation, sentence (7) just asks whether it is physically possible to get to a particular location by car in five minutes. It might turn out that the only way to get there in five minutes is to do something deeply immoral (say, driving on the sidewalks and endangering the pedestrians). However, on this first interpretation, even if that turns out to be the case, the correct answer would still be 'Yes.' By contrast, on a second interpretation, the sentence only quantifies over possibilities in which you don't do

anything immoral. It asks whether there are possibilities compatible with your moral obligations in which you get to a particular location in five minutes. On this second interpretation, if the only way to get there in five minutes was to do something deeply immoral, the correct answer would be 'No.'

Recent research suggests that these different interpretations are not simply on a par. Instead, as Jonathan Phillips and colleagues have argued, there appears to be a *default* interpretation of modals (Phillips and Cushman, 2017; Phillips & Knobe 2018). On this default interpretation, both prescriptive and statistical considerations are relevant. In other words, the default is an interpretation on which the modal quantifies over possibilities that are prescriptively permissible and also statistically plausible. This is not to say that people are unable to get interpretations of these sentences on which they simply make claims about what is physically possible; it is only to say that people can only get those other interpretations by overriding the default interpretation.

Recent studies by Phillips and colleagues provide strong evidence for this hypothesis. These studies show that people shift toward an interpretation that involves both prescriptive and statistical considerations when they are forced to answer quickly (Phillips and Cushman, 2017) and that young children have difficulty getting an interpretation on which either prescriptive or statistical considerations are not relevant (Shtulman & Phillips, 2018). When adults are thinking in a more reflective way about modal sentences, they can get such interpretations, but in doing so, they seem to be overriding the default interpretation.

2.2 Scales and normality

The second phenomenon is judgments of *normality*. Suppose you are talking about the amounts of TV that different people watch per day. We might find a pattern like this:

> Margaret: 0 hours
> John: 2 hours
> Fred: 7 hours

We can conceptualize these amounts as *degrees along a scale* which measures how much TV someone watches (see, e.g., Kennedy 1997). This scale structure then allows us to make sense of comparisons: given any two people, we can ask whether the amount of TV one of them watches is greater than, less than, or equal to the amount the other watches. Existing research in semantics has explored the logical properties of scales like this one and structural differences between different kinds of scales (e.g., differences between the structure of the scale of amounts of TV and the structure of the scale of temperature; Kennedy & McNally 2005).

Much of this research agrees that our judgments about constructions that concern scales are made relative to a *standard degree*. Thus when we say that Ann is tall, we are saying that her height exceeds a degree which represents the standard for tallness. Likewise in the example above, we might have an intuitive sense that there is a

standard amount of TV to watch in a day. Then we might feel that that the amount Margaret watches is less than the standard amount and that the amount Fred watches is more than the standard amount (judgments which might give rise to assertions like 'Margaret watches a small amount TV' and 'Fred watches a large amount of TV').

At least in principle, people are capable of comparing a given degree to a standard picked out using purely statistical criteria or purely prescriptive criteria. If people are trying to make sense of a given degree on a scale, they can ask whether this degree is higher or lower than the average (statistical) or whether it is higher or lower than the ideal (prescriptive).

Strikingly, however, it appears that people also have a way of picking out degrees that mixes together statistical and prescriptive considerations. Specifically, people have a conception of the *normal* degree on a scale, and this conception appears to be a statistical/prescriptive hybrid (Icard et al. 2017; Wysock 2018; Bear & Knobe 2017). Continuing with our example, consider the normal amount of TV to watch in a day. Existing studies show that the amount of TV people regard as normal is not simply equal to the amount people regard as average, nor is it equal to the amount people regard as ideal. Instead, it is an amount that is intermediate between the two -- greater than the average but lower than the ideal (Bear & Knobe 2017). Similar results have been observed in a variety of other cases: the normal amount of hours to exercise per week, the normal amount of lies told per week, the normal percentage of students to cheat on an exam.

Here again, research indicates that this statistical/prescriptive mixture expresses people's default mode of reasoning. That is, even though people are capable of comparing a given degree to the average or to the ideal, their default seems to be to compare degrees to the normal.

Perhaps the most direct way to get at participants' default is not to ask them any specific question at all but simply to instruct them to name the first thing that comes to mind (e.g., the first amount of TV per day that comes to mind). When participants are given this instruction, they show a systematic tendency to respond with amounts that are intermediate between the statistical average and the prescriptive ideal. More tellingly, the notion of normality appears to play a key role in the way people pick out the standard used for assessing gradable adjectives. Thus, the amount one has to exceed before one is seen as having watched a 'large' amount of TV is not the average or the ideal but rather an intermediate point.

Taken together, these results provide evidence for the claim that people's default mode of reasoning about degrees on scales involves a mixture of statistical and prescriptive considerations. At least in this one specific respect, we find a similarity between people's way of reasoning about degrees on scales and their reasoning about possibilities.

2.3 Genericity

The third phenomenon we will discuss is *genericity*. Roughly speaking, generics make claims about what properties are characteristic of members of a given kind (as opposed to sentences which express statements about particular events or particular properties). In English, we can express genericity in a variety of ways. Here are two examples:

(8) Turtles live for a hundred years.

(9) A bishop moves diagonally.

These two sentences are generics of two very different types. Sentence (8) is a *bare plural generic* (whose subject is the bare plural noun phrase 'turtles'), while (9) is an *indefinite singular generic* (whose subject is the indefinite singular noun phrase 'a bishop'). We will be returning below to the differences between these two types of generics, but for the moment, we will focus on certain respects in which they are similar.

The first thing to note is that, here again, one finds a mixture of the statistical and the prescriptive.[4] As one example, suppose that a speaker is trying to explain a ritual called a 'kobux' and uses one of the generics:

(10) a. Kobuxes begin with the traditional blessing.
b. A kobux begins with the traditional blessing.

On one hand, both of these generics seem to be making a statistical claim about how kobuxes usually begin. On the other, both of them seem to making a prescriptive claim about how kobuxes ought to begin. We will be exploring this issue further in our next experiment.

Importantly, here too, there is strong evidence that this phenomenon expresses a default mode of reasoning. People are capable of using purely statistical forms of generalization, but as Sarah-Jane Leslie and others (2008) have argued (Leslie 2007, 2008; see also Gelman 2010), a variety of different kinds of evidence suggest that people's default is to use generic generalization. In other words, people are capable of engaging in the sort of purely statistical generalization that might be expressed by a sentence like 'All Kobuxes begin with the blessing' or 'The majority of Kobuxes begin with the blessing,' but in engaging in such generalizations, we would be going beyond our default. The default is to engage instead in the kinds of generalization that could be expressed by a generic sentence like 'Kobuxes begin with the blessing.'

One of the most powerful piece of evidence for this view comes from research in cognitive development. Children seem to acquire generics by the age of two, which is

[4] Some generics--sometimes called ‘striking generics’---seem to be associated with negative rather than positive normative valence (‘Mosquitoes carry West Nile’). So let us emphasize here that our claim is not that all generics mix the statistical and prescriptive, but only that many do.

significantly earlier than when they acquire explicit quantifiers like 'every' and 'some' (Gelman 2003; Roeper, Strauss & Pearson 2006, Leslie 2008). Moreover, at the age of three, children tend to interpret sentences with overt quantifiers as though they instead contained generics (Hollander, Gelman & Star, 2002). This is exactly the developmental trajectory one might expect on the assumption that all people – both children and adults – treat generics as a default but children almost always go with the default while adults are capable of overriding the default and making use of purely statistical criteria.

In short, existing research on generics points to the same basic pattern observed for modality and for normality. People's default mode of reasoning appears to involve a mixture of the statistical and the prescriptive.

2.4 Commonalities: Default reasoning

Modality, normality, and genericity are very different phenomena, which seem to have different subject matters: possibilities, degrees on scales and categories. Still, despite the obvious differences, we have seen that there is a striking commonality that holds across all three. In each case, people's judgments appear to be shaped by a mix of statistical and prescriptive considerations. For this reason, it may be helpful to formulate a more abstract generalization that applies to people's reasoning about all three kinds of subject matter.

To begin with, we should note that in all three cases, people seem to be capable of thinking in a purely statistical way or in a purely prescriptive way. Thus, in thinking about degrees, people are capable of comparing a given degree to the average (a purely statistical notion) or to the ideal (a purely prescriptive notion). Similar remarks apply to each of the other phenomena.

Importantly, however, it appears that people also have another way of reasoning. Instead of focusing in on an explicitly statistical question or an explicitly prescriptive question, people can just allow their minds to work in whatever way they do when there is no clearly specified goal. In such cases, we can say that people are using their *default* mode of reasoning. Our proposal is that all three of the phenomena we have been exploring rely on a default mode of reasoning in this sense. Ordinary uses of modals rely on people's default mode of reasoning about possibilities; ordinary judgments of normality rely on default reasoning about degrees; ordinary generics rely on default reasoning about categories. The evidence that there is something in common to the cognitive mechanism behind these three different kinds of judgments is that reasoning about all three seems to involve a mix of statistical and prescriptive considerations.

Research on these three other phenomena is still ongoing, and difficult questions remain about how to capture them in a more detailed cognitive theory. First, there are open questions how to understand the actual cognitive processes involved. For example, one option would be to understand these processes within the framework of dual process theory (e.g., Sloman, 1996), with the statistical/prescriptive judgments

coming from a system 1 process and the purely statistical or prescriptive judgments coming from a system 2 process. This is a very plausible hypothesis, but also one that could not be adequately evaluated without considerable further research. Second, there are open questions about how to understand the relationship between the different phenomena themselves. One option would be to posit a single underlying cognitive mechanism that explains all three, while another would be to posit distinct mechanisms but to suggest that these mechanisms are similar to each other in an important respect. We will not be attempting to settle either of these questions in the present paper.

Instead, our aim is to use the insights summarized here from existing work on modals, normality and generics as a way of gaining a better understanding of 'man' sentences. The claim we will explore is that, like these other phenomena, 'man' sentences can express a kind of default reasoning.

3. Study 2: Comparison with generics

In this section, we provide empirical evidence for the claim that our target uses of 'man' sentences are similar in important respects to some of the other phenomena discussed in the previous section. We will be focusing in particular on the claim that they are similar to generics.

Note that the hypothesis is not that our target uses of 'man' sentences actually *are* generics. 'Man' sentences differ from generics in a number of ways. Rather, the hypothesis is that 'man' sentences resemble generics in that they both express a form of default reasoning. We test this hypothesis by asking whether our 'man' sentences and certain corresponding generics show a similar mix of statistical and prescriptive considerations. We will focus on one particular comparison, namely between 'man' sentences and generic sentences involving the category of *persons*. We will be exploring both indefinite singular generics (IS generics) and bare plural generics (BP generics). In particular, we will be comparing the sentences:

['Man' sentence] 'In Daxland, one does not trall.'

[IS generic] 'In Daxland, a person does not trall.'

[BP generic] 'In Daxland, people don't trall.'

Although the two generic sentences used here may seem quite similar in meaning, existing research has identified a number of important differences between IS generics and BP generics. Most importantly, generics of these two types pattern differently with respect to accidental properties and properties that are in some sense `essential' to them (e.g., Lawler, 1973). It has proven quite difficult to explain, at a more theoretical level, how the two types of generics differ, and a number of competing accounts have been proposed (Cohen, 2001; Greenberg, 2003; Krifka, 2013). We will not address this complex debate here, but in light of this previous research, we thought it would be helpful to compare 'man' sentences with both kinds of generic sentences.

Native speakers report that it sounds very odd in German to use an IS generic with 'a person' (*ein Mensch*), and so we translated all of the materials into English, using 'one' as our translation of 'man' (since, despite the fact that it sounds somewhat unnaturally high register, it is unambiguously an impersonal pronoun), and ran this second study on native English speakers.

Method

Participants. We aimed to recruit at least 360 participants who spoke English as their native language and showed a necessary amount of attention. Because we had experienced failure rates of our attention check as high as 57% in previous studies, we recruited 620 participants located in the United States from Amazon's MTurk. Of those, roughly 27% (165 participants) did not pass the attention check and approximately 2% (10 participants) did not state English as their native language and were dropped for further analysis. Our sample thus consisted of 445 participants (51.9% female, M=36.4 years old, SD=11.8 years, 78,4% Caucasian) which leaves us with an overall drop-out rate of 28.2% (175 participants). All participants were paid $0.35 for completing the experiment.

Materials and procedure. All participants received the same introductory story frame.

> Frank and Thomas are from a region in which people trall. It is not relevant to this study what exactly tralling is. However, you can be sure that Frank and Thomas know what tralling is. Frank and Thomas now travel to a country which Thomas has never visited before: Daxland.

Every participant then received three statements that Frank could make about tralling: the 'man' sentence, the IS generic, and the BP generic (see above). Statements were presented in random order.

Each participant was randomly assigned a single question to answer regarding all five statements. For each of the five statements, some participants were asked whether they agreed with one of the following prescriptive claims:

> [*Offense*] 'If Thomas tralled in Daxland, he would cause offense.'
>
> [*Warning*] 'Frank wants to warn Thomas not to trall.'
>
> [*Accusations*] 'If Thomas tralls in Daxland, the Daxlanders will say that he did something wrong.'

Some were asked whether they agreed with one of the following statistical claims:

> [*Proportion*] 'Frank wants to inform Thomas about the proportion of Daxlanders who trall.'

[*How many*]: 'This sentence states how many Daxlanders do indeed trall.'

[*Verifiable*]: 'This sentence is statistically verifiable.'

Participants rated the degree to which the statistical or prescriptive claim they received matched each of the three sentences. Ratings were expressed on a seven-point Likert Scale, ranging from 'strongly oppose' (1) to 'strongly agree' (7).

The last page of the experiment consisted of demographic questions, but also included an attention check that consisted of the following question: 'To confirm that you are not a robot and read the questions carefully, please give two as the answer to the following question. How much is 4+2?'. Participants answered this question on a horizontal scale ranging from 1 to 7.

Results

Means and standard deviations for each question regarding each sentence are presented in Table 1. We ran paired sample t-tests comparing answers to each question regarding the *one* sentence to answers to the same question regarding the other two sentences (*person*, *people)*.[5] The t- and p-values of those tests are displayed in Table 2 in the appendix.

Table 1. Means and standard deviations (in parentheses) for each question (columns) regarding each statement (rows). Significance levels for the t-tests are displayed with asterisks (* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$).

Condition	Prescriptive Questions			Statistical Questions		
	Offense	Warning	Accusations	Proportion	How Many	Verifiable
IS generic	5.26 (1.26)	5.52 (1.18)	5.13 (1.44)	4.59 (1.87)	3.74 (2.13)	4.35 (1.73)
BP generic	4.91*** (1.5)	5.2* (1.44)	4.69* (1.62)	5.20** (1.87)	3.9 (2.26)	5.05** (1.83)
Man sentence	5.47 (1.3)	5.72 (1.23)	5.08 (1.64)	4.39 (1.97)	3.62 (2.12)	4.36 (1.74)

[5] We preregistered our analyses for this study (https://aspredicted.org/r7fa4.pdf).

The comparison of the 'man' sentence to both the BP generic and the IS generic shows a clear pattern: while the BP generic is consistently rated as lower than the 'man' sentence under all three prescriptive questions, it is also rated as higher than the 'man' sentence under two of three statistical questions. In contrast to the BP generic, the IS generic does not show any difference from the 'man' sentence, on either the prescriptive or the statistical questions.

This pattern of results is easily visible in Figure 1. Here, we treat the mean of the three prescriptive questions as a measure of prescriptivity (y-axis) and the mean of the three descriptive questions as a measure of statisticality (x-axis). Firstly, we can see that all three statements have high values on both scales. Furthermore, though, we can see that the IS generic and the 'man' sentence show similar values on both axes whereas the BP generic shows a significant distance, being clearly more statistical than its two counterparts and also slightly less prescriptive.

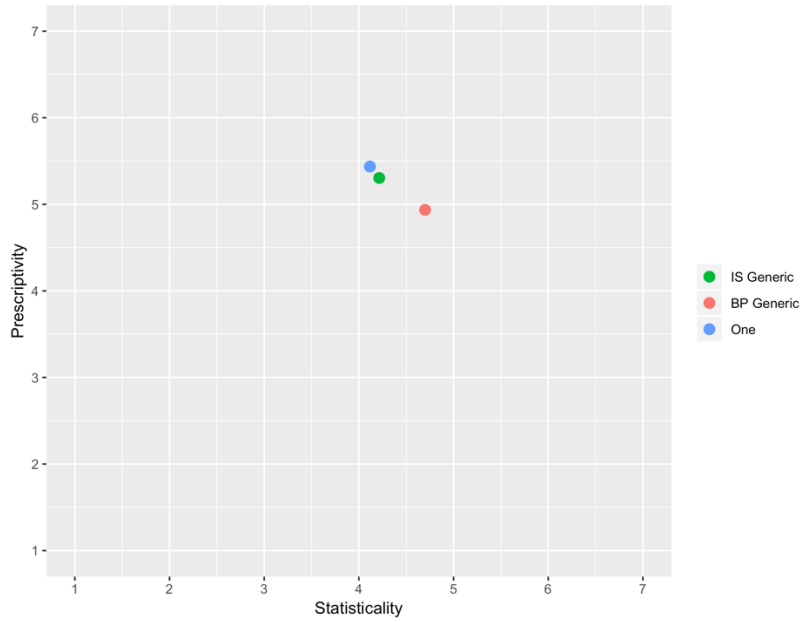

Figure 2. Mean scores from descriptive questions (x-axis) and prescriptive questions (y-axis) for each statement.

Discussion

This second experiment examined people's intuitions about 'man' sentences, BP generics, and IS generics. People saw all three types of sentences as conveying both statistical and prescriptive content. More strikingly, people showed an extremely similar pattern of responses to 'man' sentences and IS generics, seeing these sentences as almost exactly the same in the degree to which they conveyed statistical and

prescriptive content. This result provides evidence that there is some important similarity between 'man' sentences and IS generics. By contrast, subjects reacted in slightly different ways to BP generics with 'people' than to the corresponding IS generics and 'man' sentences.

The results of Experiment 2 thus support our big-picture hypothesis that there is a close connection between 'man' sentences, on the one hand, and other kinds of default representation, on the other. In particular, these results suggest that our 'man' sentences pattern very much like a certain kind of IS generic, namely IS 'a person' generics.

4. Default reasoning about actions

In Section 2, we sketched a picture on which people are capable of default modes of reasoning in application to various kinds of things (possibilities, degrees, categories). The evidence that there is a common thread across these different kinds of reasoning, while speculative, is that all of them combine statistical and prescriptive information. As we have seen in the first experiment, our target uses of ‘man’ sentences likewise combine statistical and prescriptive information; as the second experiment has shown, they do this in a way that is strikingly similar to corresponding ‘a person’ generics. This suggests that our target uses of ‘man’ sentences may likewise express a kind of default reasoning, in particular about *actions*.[6]

Why think that there might be a connection between ‘man’ sentences and actions in particular? One piece of evidence comes from facts about the distribution of impersonal pronouns. In many cases, impersonal pronouns sound fine in sentences about actions (11a-d). By contrast, 'man' sentences about emotions, knowledge or bodily states (11e-h) sound strange, even if those sentences seem to be trying to express the kind of thought that typically is expressed by 'man' sentences (namely, that something is both good and common).

(11) a. This is how you make coffee.
b. In England, you drive on the left.
c. To get to Harlem from here, you take the L train and then the A train.
d. At a Jewish funeral, you recite the mourner's Kaddish.
e. # You have a nose. (Moltmann 2006)
f. # In Russia, you have a lot of knowledge of poetry.
g. # You are more than 4 feet tall.
h. # At a funeral, you feel sad.

It should be noted that not all ‘man’ sentences that seem to be expressing something both statistical and prescriptive are *directly* about actions, as in (12):

(12) a. In the south, you get your nose pierced when you are young.

[6] See Heidegger 1927/1992 for related suggestions.

b. In Russia, you have a poem which is passed down father to son.
c. At a well-conducted funeral, you feel a full range of emotions.
d. At Christmas, you get presents.
e. In the US, you have the right to remain silent.

But even these sentences seem to be *indirectly* about actions: all these sentences are about someone's actions (the present-giver, the police, etc.), even if not about 'one's' actions.

A second, closely related piece of evidence comes from apparent failures of logical closure in 'man' sentences. It seems correct to say: 'In Saudi Arabia, you eat with your right hand.' And of course having a right hand entails having a hand. Yet it seems wrong to say: 'In Saudi Arabia, you have a hand.' The point can be extended with the following variants of (11b) and (11d):

(13) a. In England, you drive on the left. -/-> In England, you have a car.
b. At a Jewish funeral, you stand up for the mourner's Kaddish. -/-> At a Jewish funeral, you have legs.

These failures of logical closure are puzzling at first glance, but are readily explained if 'man' sentences are generally about actions.

A third piece of evidence comes from some subtle but important contrasts between 'a person' generics and 'man' sentences. In the second experiment, we presented evidence that in some cases, these pattern closely together in certain respects. But in some other cases, there are some striking contrasts between these, which we think may be well-explained by maintaining that, while indefinite singular generics call on a default way of reasoning about categories, our target 'man' sentences instead call on a default way of reasoning about actions.

Many facts which we might take to represent natural default generalizations about people do not involve actions, and these facts give rise to natural 'a person' sentences, but not natural 'man' sentences:

(15) a. A person has beliefs, desires and emotions.
b.?? You have beliefs, desires and emotions.

(16) a. A person has intrinsic moral worth.
b. ?? You have intrinsic moral worth.

(Note that (15b) and (16b) have felicitous readings, but only when 'you' has a personal interpretation.) Conversely, many facts about actions do not really have anything to do with the category of people per se, leading to natural 'man' sentences but not natural 'a person' generics:

(17) a.?? A person calculates the inverse of a matrix like this.

b. You calculate the inverse of a matrix like this.

(18) a. ?? In Oxford, a person wears a gown to dinner.
b. In Oxford, you wear a gown to dinner.

We can make sense of these contrasts, again, by maintaining that 'man' sentences and IS generics generally differ on their subject matters: the former, at least on their default uses, are in some sense about actions, whereas the latter are about something more like categories.

We should note, of course, that we are not saying that all 'man' sentences are about actions; many are not. But we think that the evidence surveyed here at least suggests that 'man' sentences which mix statistical and prescriptive information in the characteristic way we have explored here in some sense represent a default mode of reasoning about actions, which suggests that studying 'man' sentences like those we have explored here may provide a window into this kind of cognition.

A natural question to ask at this point is what role default reasoning about actions might play in cognition. A helpful way to get a sense for this question is to consider a simple example. Suppose you are coming to understand the culture of academia and, in particular, that you are gradually learning about the way people behave in colloquium talks. One thing you could do is to develop a (purely statistical) representation of what people usually do in colloquia. Another thing you could do is to develop a (purely prescriptive) representation of the ideal thing to do in colloquia. Yet another thing you could do is to develop a representation of *what one does* in colloquia which mixes statistical and prescriptive features. We think that the 'man' sentences we have explored here provide *prima facie* evidence that this third kind of thing---the development of a default representation of kinds of actions---plays a role of some kind in cognition.

What would the cognitive role be for such a default representation? Would it impact the way you decide what to do, the way you predict other people's behaviors, or the way you make judgments about behaviors that have already been performed, and if so, how? And when and how would we override this tendency (e.g., by thinking in a way that is more purely statistical or purely prescriptive? These are substantial questions which require much further research. As a promissory note, however, let us note that there is substantial support across a variety of disciplines for the idea that many cognitive processes operate on a limited set of actions. These processes consider actions that fall within the set and weigh considerations that might speak in favor of one of them or against another, while simply ignoring those actions that fall outside the set . Researchers in a number of different disciplines, in particular decision theory and semantic theory, have independently developed ideas along more or less these same lines.[7] The basic idea is well captured by this passage from Wedgwood 2017:

[7] See e.g. Cariani 2013, Cariani et al. 2013 on their role in deontic modals; Horty and Belnap 1995, Hawthorne 2001, Mandelkern et al. 2017, Mandelkern and Phillips 2018 on their role in agentive modalities; Wedgwood 2017 on their role in decision the

> In every situation in which you might act, there are infinitely many courses of action that you might take; but if you are a gappy agent like me, you will only ever think of (or have attitudes towards) a small finite subset of that vast infinite set. In general, you need to think of each of the courses of action that you decide between as an option: you make your choice or decision precisely by comparing these options with each other, and deciding on one of the options that does not in the relevant way seem worse than any alternative. So, the crucial presupposition of every decision is the set of options that the agent is deciding between…But where does this set of options come from?

Given this theoretical assumption, it becomes possible to formulate a hypothesis about the role of representations of *what one does*: namely, as providing answer to this last question. We can think of what one does as a set of actions representing a determinable action (at a colloquium, one presents research, even if there is no *particular* research such that, at a colloquium, one presents *that* research). The characteristic role of default representations of actions, then, may be to play a role in setting the default value of the set of actions which are treated as available in a given situation---a default that can, of course, be overridden for a variety of reasons. To the extent that this picture turns out to be correct, it would give us the beginnings of an understanding of the way in which a default representation of actions influences cognition.

5. Conclusion

We have shown that some uses of impersonal pronouns combine statistical and prescriptive information in a way that is strikingly similar to certain uses of modals, normality ascriptions, and generics---in particular ‘a person’ generics. This suggests that there may be something in common to the cognitive mechanism responsible for all these phenomena. In particular, we put forward the hypothesis that the target uses of ‘man’ sentences may represent a kind of default reasoning about actions, which, in turn, may play a key role in determining decision problems: determining which actions are salient to agents when they deliberate about action and predict and judge other actions. This hypothesis is speculative and preliminary, and much more work is required to see whether it has sufficient explanatory payoff to license its adoption---in particular, we would need a theory of when impersonal pronouns are used to express default reasoning of actions and when they are not, and a clearer sense of what the predictions of this theory amount to; but we hope to have said enough to show that further research along these lines is merited.

Appendix

Table 2. t- and p-values for paired sample t-tests comparing ratings for each question on the one statement to ratings for the same question on each other statement.

Condition		Prescriptive Questions			Statistical Questions		
		Offense	Warning	Accusations	Proportion	How Many	Verifiable
Prescriptive Statements	Should	t (58) = -1.9765 p = 0.053	t (57) = -2.0637 p = 0.044	t (60) = 0.5515 p = 0.5833	t (62) = 6.7332 p < .001	t (60) = 4.5292 p < .001	t (61) = 6.4577 p < .001
	Improper	t (58) = -3.3611 p = 0.001	t (57) = -2.8557 p = 0.006	t (60) = -1.3772 p = 0.1736	t (62) = 3.3124 p = 0.0015	t (60) = 2.5861 p = 0.012	t (61) = 4.6469 p < .001
Statistical Statements	Few	t (58) = 7.1372 p < .001	t (57) = 8.7324 p < .001	t (60) = 9.4944 p < .001	t (62) = -6.8126 p < .001	t (60) = -2.6393 p = 0.011	t (61) = -1.8943 p =0.063
	Average	t (58) = 8.1765 p < .001	t (57) = 9.2398 p < .001	t (60) = 8.9973 p < .001	t (62) = -5.075 p < .001	t (60) = -1.003 p = 0.3198	t (61) = -0.2424 p = 0.8093
Impersonal Statement	Man	-	-	-	-	-	-
N=364	n	59	58	61	63	61	62

Original German phrasing

Story frame
'Frank und Thomas kommen aus einer Gegend, in der getrallt wird.
Was genau trallen bedeutet, ist für die Zwecke dieser Erhebung unerheblich. Sie können aber davon ausgehen, dass Frank und Thomas wissen, was trallen ist.
Frank und Thomas reisen nun in ein Land, in dem Thomas noch nie zuvor war: Daxland.'

Questions

Offense	'Wenn Thomas in Daxland trallt, würde er damit Anstoß erregen.'
Warning	'Frank will Thomas davor warnen, zu trallen.'

Accusations	'Wenn Thomas in Daxland trallt, werden ihm Vorwürfe von den Daxländern gemacht werden.'
Proportion	'Frank will Thomas über den Anteil der Daxländer informieren, die trallen.'
How Many	'Mit diesem Satz wird ausgesagt, wie viele Daxländer tatsächlich trallen.'
Verifiable	'Dieser Satz ist statistisch verifizierbar.'

Statements

Should	'Du sollst in Daxland nicht trallen.'
Improper	'In Daxland gehört es sich nicht zu trallen.'
Man	'In Daxland trallt man nicht.'
Few	'Es gibt nur wenige Menschen, die in Daxland trallen.'
Average	'Im Durchschnitt wird in Daxland nicht getrallt.'

Table 2. t- and p-values for paired sample t-tests comparing ratings for each question on the man sentence to ratings for the same question on each other statement.

Condition	Prescriptive Questions			Statistical Questions		
	Offense	Warning	Accusations	Proportion	How Many	Verifiable
IS generic (person)	t (73) = 1.8985 p = 0.0616	t (74) = 1.349 p = 0.1815	t (70) = -0.3818 p = 0.7038	t (68) = -0.6488 p = 0.34	t (76) = -0.6488 p = 0.5184	t (76) = 0.0896 p = 0.9289
BP generic (people)	t (73) = 3.6354 p < .001	t (74) = 2.5286 p = 0.0136	t (70) = 2.2334 p = 0.0287	t (68) = -3.3073 p = 0.0015	t (76) = -1.1863 p = 0.2392	t (76) = -3.3952 p = 0.001
Man sentence (one)	-	-	-	-	-	-
N=443	n=74	n=75	n=71	n=69	n=77	n=77

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