From Artifacts to Human Lives: Investigating the Domain-Generality of Judgments about Purposes

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Abstract

People attribute purposes in both mundane and profound ways—such as when thinking about the purpose of a knife and the purpose of a life. In three studies (total *N* = 13,720 observations from *N* = 3,430 participants), we tested whether these seemingly very different forms of purpose attributions might actually involve the same cognitive processes. We examined the impacts of four factors on purpose attributions in six domains (artifacts, social institutions, animals, body parts, sacred objects, and human lives). Study 1 manipulated what items in each domain were originally created for (original design) and how people currently use them (present practice). Study 2 manipulated whether items are good at achieving a goal (effectiveness) and whether the goal itself is good (morality). We found effects of each factor in every domain. However, whereas morality and effectiveness had remarkably similar effects across domains, the effects of original design and present practice differed substantially. Finally, Study 3 revealed that, within domains, the effects of original design and present practice depend on which entities design and use items. These results reveal striking similarities in purpose attributions across domains and suggest that certain entities are treated as authorities over the purposes of particular items.

Public Significance Statement

The concept of purpose plays an important role in many areas of human life. In one area of research, psychologists have explored the factors that shape mundane, everyday sorts of purpose judgments (e.g., the purpose of a particular kind of knife). And, in another area, psychologists have studied the downstream consequences of far more profound sorts of purpose judgments (e.g., the purpose of one's life). In these experiments, we asked whether people use the same or different criteria when thinking about different kinds of purposes. We found a striking degree of similarity in the way that people think about the purposes of artifacts, social institutions, body parts, animals, sacred objects, and human lives. This points to a deep connection between two bodies of research that might otherwise seem disconnected and suggests that, perhaps, to understand how people think about the purpose of a life, we might begin by considering how people think about the purpose of a knife.

From artifacts to human lives: Investigating the domain-generality of judgments about purposes

People attribute purposes to all kinds of things. Yet, these different uses of the concept seem very different from each other. On one hand, there are mundane, everyday cases in which people attribute purposes. For example, when thinking about kitchen knives, a person might think that different knives have different purposes—one is for slicing bread, one for chopping vegetables, and so forth. On the other hand, people often invoke the concept of purpose when they are thinking about some of the deepest and most meaningful questions a human being can face. For example, in a moment of crisis, a person might wrestle with questions about the true purpose of their life.

In this paper, we investigate how people attribute purposes across a wide range of domains, including ordinary artifacts, human lives, and more. One plausible hypothesis would be that people have fundamentally different ways of attributing purposes in different domains. On this hypothesis, the way people try to figure out whether something is the purpose of their life is completely different from the way they try to figure out whether something is the purpose of a knife. However, another possible hypothesis would be that people actually attribute purposes in much the same way across domains. On this second hypothesis, the criteria that people use in attributing purposes in more deeply meaningful domains are actually the very same criteria that they use when they are simply thinking about ordinary artifacts. If this second hypothesis is correct, this would reveal an important and surprising connection between programs of research that otherwise seem unrelated.

Mundane and profound purposes

Much of the existing research on purpose attributions has been on judgments people make about mundane everyday things, such as ordinary physical artifacts like tools (Chaigneau et al., 2008; Joo et al., 2021; Siegel & Callanan, 2007). Numerous studies have carefully examined the cognitive processes behind these judgments, exploring which factors influence these judgments (Chaigneau et al., 2004; German & Johnson, 2002), and how the ability to make these judgments develops in early childhood (Defeyter et al., 2009; Matan & Carey, 2001).

In a largely separate body of research, there has been important work on how people invoke the concept of purpose when they are talking about the most meaningful questions they face in their lives. Someone might wonder about the purpose of prayer, the purpose of the Supreme Court, the purpose of art, or even the purpose of their own life. Within existing research on these more profound sorts of purpose attributions, many of the most striking findings are about how people think about the purposes of their lives. An overwhelming majority of people believe that life has a purpose. To illustrate, the United States General Social Survey found that less than 3% of US adults agree with the statement, “life does not serve any purpose” (GSS, 2018). Some studies have explored how people arrive at different beliefs about the purpose of life (Damon et al., 2003). Yet much of the work in this area has focused on the consequences of such beliefs. For example, personality and social psychologists have found that people who believe that their life has a clear purpose experience greater mental well-being (Boreham & Schutte, 2023; Bronk et al., 2009), less neurological disease (Boyle et al., 2010), fewer physical

health problems (Boehm & Kubzansky, 2012; Kim et al., 2013), and even live longer (R. Cohen et al., 2016).

Research in the psychology of religion has found that the purpose judgments people make about these more deeply meaningful questions often have a supernatural character (Banerjee & Bloom, 2014; Ramsay et al., 2019). When a person gets cancer, she may come to think that her cancer serves some larger purpose in her life (Scheier & Carver, 2001), and this type of judgment is sometimes spelled out in religious terms (Svedholm et al., 2010). Similarly, people may think that our planet has a purpose (Turpin, 2022), that species have purposes (Lewry et al., 2023), or that the universe itself has a purpose (Goff, 2023)—and again, these judgments tend to be closely tied to religious beliefs.

A key question now is whether these different forms of purpose judgments are fundamentally different or whether they are unified. One obvious hypothesis would be that when a person is wrestling with questions about the purpose of her life, she is doing something fundamentally different from anything she would do when trying to figure out whether the purpose of a particular knife is to slice bread or chop vegetables. This hypothesis fits well with a philosophical theory tracing back to Aristotle (trans. 1936), according to which the sense in which a human being's life can have a purpose is fundamentally different from the sense in which ordinary artifacts have purposes.

By contrast, a second possible hypothesis would be that the criteria people use when making judgments about the most meaningful kinds of purposes are the very same criteria they use when attributing purposes to ordinary artifacts. If so, then purpose attributions in cases that seem at least partly supernatural would turn out to involve the

same basic criteria at work in purpose attributions for ordinary artifacts (Kelemen, 2004; Kelemen et al., 2013). If this second hypothesis does turn out to be correct, then all of the detailed work from existing research on attributions of purposes in more mundane, ordinary cases might also apply to some of the judgments people make about the most deeply meaningful questions in their lives.

Criteria for purpose attributions

One approach to investigating questions about domain-specificity versus generality involves focusing on the criteria that influence judgments in different domains (e.g., De Freitas et al., 2014). After all, if purpose attributions for artifacts were shaped by one set of criteria and purpose attributions for human lives were shaped by a totally different set of criteria, then this would be evidence in favor of the domain-specific hypothesis. If, however, a single set of criteria influences purpose attributions across a diverse range of domains—and especially if the influence of each criterion is the same across domains—then this would be strong evidence for the domain-general hypothesis.

Among the factors that influence purpose judgments, two have been studied extensively in existing work. We will call these *original design* and *present practice*. The key distinction here is between what something was originally created for and how people have since decided to use it. For a simple case in which these two come apart, suppose some metal tubes were created to be used as drinking straws (original design), but are now used as wind chimes (present practice). A question now arises as to how much influence each of these factors would have on purpose judgments in each domain.

Within existing research, this question has been explored most extensively in the domain of artifacts. Studies have found that both original design and present practice

have substantial effects on people's judgments. Some studies find that people tend to give greater weight to original design (Chaigneau et al., 2008; German & Johnson, 2002; Matan & Carey, 2001), whereas others find that people tend to give greater weight to present practice (Joo et al., 2021; Siegel & Callanan, 2007), but the literature as a whole clearly indicates that both of these factors have an impact.

Another factor investigated in some studies is *effectiveness*. Independently of what something was originally designed for and how it is presently used, people are more inclined to think that something has a particular purpose if it is effective at fulfilling that purpose (Joo et al., 2021; Rose & Schaffer, 2017). For example, if a metal tube can be effectively used as a straw, then people are more inclined to think that the purpose of the tube is for drinking than if the tube is not effective for this use.

Finally, although not as well-studied, one other factor is *morality*. Several studies have found that, when people think about the purpose of a person's life, they think about morally good things: making the world a better place, saving lives, caring for people, and so on (Baumsteiger et al., 2022; Bronk et al., 2023). Moral considerations have been found to affect a surprisingly wide range of apparently non-moral judgments (Beebe & Buckwalter, 2010; Knobe, 2003; J. Phillips et al., 2017). Hence, it may be that people are generally more inclined to think that something has a particular purpose if that purpose would be morally good.

Given that there are a range of factors that influence judgments about purposes, the question arises of how these factors are applied across domains. As noted above, it is possible that the same criteria play the same roles, regardless of whether people are considering the purposes of ordinary physical objects, animals, or even human lives.

However it is also possible that people reason very differently about purposes in these different domains.

Some findings from the existing literature might be taken to support the first, domain-general hypothesis. Existing theoretical work suggests that there is a deep connection between the cognitive processes people use to make purpose judgments for biological organs, human lives, etc. and the processes they use to make purpose judgments for ordinary physical artifacts (Kelemen et al., 2013; Kelemen & Rosset, 2009; Rose, 2022). According to this theory, when people think that, say, an animal has a purpose, there is an important sense in which they are thinking about this animal using the very same cognitive processes they might use in thinking about an artifact. A particularly strong version of such a theory would say that the criteria people apply when making purpose judgments are therefore the same across all these domains. In addition, there is at least some initial empirical evidence suggesting that people do apply similar criteria across different domains. Studies find that the impact of different factors is almost exactly the same for judgments about the purposes of laws as it is for judgments about the purposes of physical artifacts (Almeida et al., 2022).

However, there are also reasons to believe the second, domain-specific hypothesis is correct. The basic thought would be that, although people think that many different kinds of things (ranging from physical objects to body parts to people's lives) can have purposes, they are thinking about purposes in very different senses. In fact, there is a long tradition within philosophy—going back to Aristotle (trans. 1936), but still maintained today (Lewens, 2004; Matthen, 1997; Reiss, 2009)—according to which, artifacts and natural phenomena (like species) have purposes in fundamentally different

ways. Artifactual purposes, on this theory, are extrinsic and depend entirely on the intentions of external agents, whereas natural purposes are intrinsic, and given by something's nature.

To illustrate this idea, consider the contrast between an artifact and a body part. As noted above, research shows that present practice impacts purpose judgments for artifacts (e.g., Joo et al., 2021; Siegel & Callanan, 2007). For example, if a group of office workers decides to use a particular file cabinet specifically for storing party decorations, then people will tend to think that the purpose of the cabinet is to store party decorations. But purpose judgments for biological entities might look very different. If a person decided to use their elbow specifically for closing cabinets, it's not clear whether people would think that the purpose of the person's elbow is now to close cabinets. So one might expect that present practice would only impact judgements about artifactual purposes, and not judgements about natural purposes.

Similarly, there is at least some reason to expect that judgments about the purposes of human lives might be different from purpose judgments in other domains. Although one study found that moral considerations did not affect purpose attributions for artifacts or laws (Almeida et al., 2022), previous research suggests that the ways in which people think about human lives is very closely tied to morality. Moral considerations have been shown to impact judgments about whether someone has a meaningful life (Fuhrer & Cova, 2022; Prinzing et al., 2022), what a person's true self is driving them toward (De Freitas et al., 2018), which aspects of a person constitute their personal identity (Strohminger & Nichols, 2014, 2015; Tobia, 2015), and even whether someone truly counts as human at all (B. Phillips, 2022). These existing studies have not examined

purpose judgments directly. But on the assumption that there are similarities among these different kinds of judgments—e.g., between judgments about the meaning of a life and judgments about its purpose—this offers some reason to expect that moral judgments would also powerfully shape intuitions about the purposes of human lives.

For this reason, one might predict a difference between judgments about the purposes of human lives and judgments about purposes in other domains. To illustrate, consider a tool that is used for torturing prisoners versus a human being who has devoted his life to torturing prisoners. When it comes to the tool, people might think that the purpose of the tool is clearly to torture prisoners. But in light of existing findings, one might predict that people would consider morality when thinking about the purpose of the person's life. Even if a human being has devoted his life to torturing people, people might still think that the purpose of his life is to do something morally good.

The present studies

The aim of the present studies is to investigate the domain-generality of teleological reasoning by examining the role of these four factors—original design, present practice, effectiveness, and morality—across a range of different domains. Specifically, we considered the domains of artifacts, social institutions, body parts, animals, human lives and sacred objects. Our first question was whether each of these four factors would have an effect on purpose judgments in each domain. The second was whether these effects would be similar across domains. If so, then this will be evidence for the domain-generality of teleological reasoning. If they have very different effects in different domains, or if they have effects only in certain specific domains, then this will be evidence of domain-specificity. Different authors of this paper had different expectations

about what the results would be, with some of us expecting purpose attributions to work in domain-specific ways, and others expecting to find greater domain-generality.

In each study, we presented participants with vignettes about items from these six domains, systematically manipulating each of the aforementioned factors. Then, similarly to prior studies (Chaigneau et al., 2008; Defeyter et al., 2009; Joo et al., 2021; Lewry et al., 2023), we presented participants with statements about the purpose of the item and asked participants whether they agreed or disagreed with the statements. This enabled us to test whether the experimental manipulations had similar effects on participants' judgments in each domain, or if the effects looked different from one domain to the next. The key question in our analyses, therefore, was whether there were interaction effects involving domain.

Study 1 investigated the roles of original design and present practice, the factors that are most frequently studied in prior work of artifacts. Study 2 investigated the roles of effectiveness and morality, two less-studied factors that we thought might reveal greater differences across domains. Although we did not have hypotheses about interactions between the paired factors, we combined them so as to estimate the effect of each factor across levels of the other factor. Finally, Study 3 returned to original design and present practice, but also accounted for which entities create and use the items.

Study 1

In this study, we presented participants with vignettes about artifacts, institutions, human lives, sacred objects, animals, and body parts. We manipulated what these items were originally designed for and what they are presently used for. The key question was

then whether or not these manipulations would affect purpose attributions similarly across domains.

Method

Transparency and openness. We report how we determined our sample sizes, all data exclusions, all manipulations, and all measures for all studies reported in this article. Target sample sizes were determined a priori. We were unsure about the sizes of the effects that we would observe and so aimed for relatively large samples (targeting 4,800 observations from 1,200 participants per experiment). We built the surveys in jsPsych (de Leeuw et al., 2023) and analyzed the data using R. The materials, data, jsPsych and R code for all studies are all available online (https://osf.io/uj7vf/). Studies 1-3 (as well as Supplemental Study S2) were pre-registered.

The pre-registration form for this study is available online: https://osf.io/se54y. There were no deviations from this pre-registration.

Participants. We aimed to recruit 1,200 participants from Prolific, screening for fluency in English, an approval rate of at least 95%, a minimum of 10 prior submissions, and permitting computer-users only (i.e., no mobile or tablet). We received 1,198 complete responses. Participants answered multiple-choice comprehension check questions about each vignette. As pre-registered, we excluded participants (n = 28) who answered more than one of these incorrectly. This left 4,680 total observations from N = 1,170 participants (M_{age} = 39, SD_{age} = 14; 49% identified as men, 48% women, and 2% as non-binary, other gender, or prefer not to say; 11% identified as Asian, 7% Black or African American, 10% as Hispanic, 74% White, 4% mixed race, 5% other race or prefer not to say).

Procedure and Measures. This study used a 6 (Domain: Artifacts, Institutions, Human Lives, Sacred Objects, Animals, and Body Parts) × 2 (Original Design: Not Designed, Designed) × 2 (Present Practice: Presently Used, Not Presently Used) factorial design. Domain was a between-subjects factor. Original Design and Present Practice were within-subjects factors. Thus, participants only saw vignettes from a single domain. However, we presented each participant with four different vignettes, each with a different item from their respective domain. We also ensured that each participant saw one vignette for each of the four cells in the Original Design × Present Practice factorial. The presentation order was randomized.

Table 1 presents an example item from the social institutions domain. (See the Appendix for an example from each of the other domains.) In the *Designed* conditions, the vignettes stated that the items were specifically created in order to be used in a particular way. In the *Not Designed* conditions, the vignettes stated that the items were *not* designed to be used in that way, but in some other (unspecified) way. In the *Presently Used* conditions, the vignettes stated that, at present, the item is used in a certain way. In the *Not Presently Used* conditions, it specified the opposite, stating that it is never used in that way.

After each vignette, participants were asked to indicate how strongly they agreed or disagreed (1 = “strongly disagree”, 7 = “strongly agree”) with a statement of the form, “The purpose of ___ is ___,” where the blanks were filled in as appropriate for the item. This question appeared on the same page as the vignette. The comprehension check appeared on the following page.

Table 1: **Example Vignettes from Study 1.**

The Jolly Candy company was started in 1967 by siblings, Joel and Tamara, who learned candy making from their mother. When they first started, their most popular product was a special kind of lollipop called rocket pops.	
Designed	*Not Designed*
In fact, that was the original idea. The siblings created the Jolly Candy company specifically to sell rocket pops.	Though, that was not the original idea. The siblings created the Jolly Candy company to sell other things.
Presently Used	*Not Presently Used*
At some point, Joel and Tamara sat down and thought about what to do with the Jolly Candy company. They decided to concentrate the company's efforts on rocket pops. Indeed, the twins made the decision not to sell other things.	At some point, Joel and Tamara sat down and thought about what to do with the Jolly Candy company. They decided to abandon the company's efforts on rocket pops. Instead, the twins made the decision only to sell other things.
Please indicate the extent to which you agree or disagree with the following statement: "The purpose of the Jolly Candy company is to sell rocket pops."	

Note. The text in the first and last rows were constant across conditions. The middle two rows were randomized, with participants reading either the *Designed* or *Not Designed* text and either the *Presently Used* or *Not Presently Used* text. The complete set of materials is available online: https://osf.io/jvp4k.

Results

Figure 1 presents the means for purpose attributions across conditions with 95% confidence intervals and distributions. To test for effects of the experimental manipulations across domains, we used a mixed-effects model with fixed effects of Domain, Original Design, and Present Practice, and random effects of item and participant. We fit the model using the lmer() function in the *lme4* package in R (Bates et al., 2020). For significance tests, we used the Anova() function in the *car* package (Fox & Weisberg, 2019) to run Type III Wald χ^2 tests.

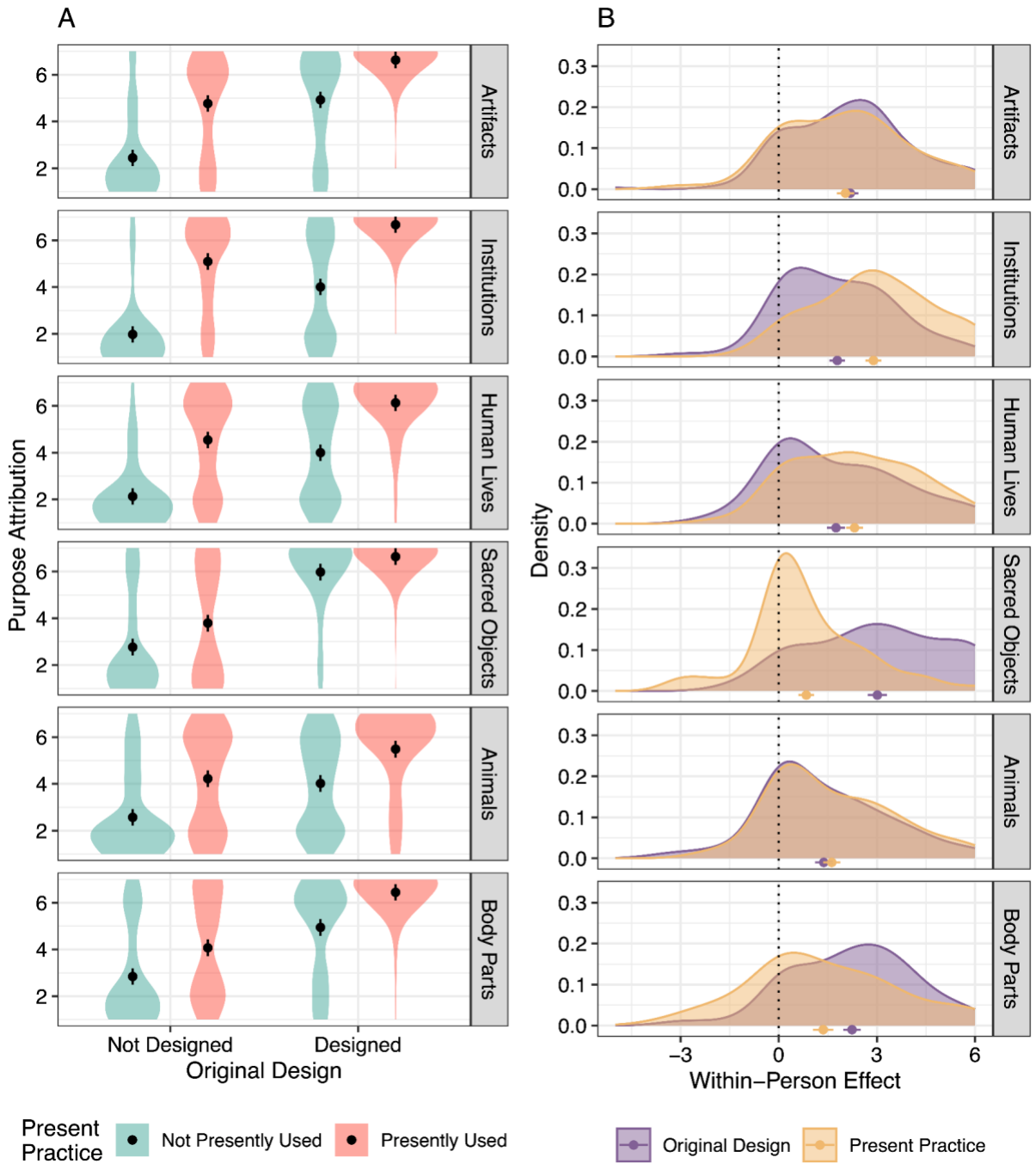

Figure 1: **Results of Study 1.** Panel A presents means across experimental conditions, with 95% confidence intervals and distributions. Panel B presents density plots of the within-person effects of each factor for each domain. Points and error bars are means and 95% confidence intervals.

There were significant effects of Domain, $\chi^2(5) = 20.23$, $p = .001$, Original Design, $\chi^2(1) = 1652.50$, $p < .001$, and Present Practice, $\chi^2(1) = 1303.40$, $p < .001$. Because the key question in this analysis was whether the two experimental manipulations had the

same or different effects across domains, we were especially interested in the two-way interactions involving Domain. Both were significant: Domain × Original Design, $\chi^2(5)$ = 105.02, $p < .001$; Domain × Present Practice, $\chi^2(5) = 170.94$, $p < .001$.

As pre-registered, we decomposed these interactions by running separate mixed-effects regressions for each domain. The two experimental factors were treated as fixed effects, whereas item and participant were treated as random effects. The results of these models are presented in Table 2. Each experimental factor had a significant effect on purpose attributions in every domain (all *p*s < .001). Yet, the magnitude of these effects varied. For example, judgments about the purposes of institutions showed a very large effect of Present Practice, (*b* = 3.12, 95% CI: [2.79, 3.44]) and a smaller effect of Original Design (*b* = 2.03, 95% CI: [1.71, 2.35]). By contrast, judgments about the purposes of sacred objects showed a large effect of Original Design (*b* = 3.20, 95% CI: [2.85, 3.55]) and a relatively small effect of Present Practice (*b* = 1.02, 95% CI: [0.67, 1.37]).

Figure 1b presents an alternative way of visualizing the effects at the participant level. As indicated above, each participant responded to a vignette corresponding to each of the four cells in the Original Design × Present Practice factorial. Hence, to show the effect of Original Design for each participant, we took the average of their responses in the two Designed vignettes and subtracted the average of their responses to the two Not Designed vignettes. To show within-person effects of Present Practice, we similarly took the average of each participant's responses in the two Presently Used vignettes and subtracted the average of their responses to the two Not Presently Used vignettes. We then visualized these values in kernel density plots.

Table 2: **Results of Domain-Specific Models in Study 1.**

Independent Variable	Domain					
	Artifacts	*Institutions*	*Human Lives*	*Sacred Objects*	*Animals*	*Body Parts*
Original Design	2.48 *** [2.15, 2.82]	2.03 *** [1.71, 2.35]	1.87 *** [1.54, 2.21]	3.20 *** [2.85, 3.55]	1.46 *** [1.13, 1.79]	2.09 *** [1.72, 2.46]
Present Practice	2.33 *** [1.99, 2.66]	3.12 *** [2.79, 3.44]	2.42 *** [2.09, 2.75]	1.02 *** [0.67, 1.37]	1.66 *** [1.33, 1.99]	1.22 *** [0.85, 1.59]
Original Design × Present Practice	-0.63 * [-1.10, -0.15]	-0.46 [-0.91, -0.00]	-0.29 [-0.76, 0.18]	-0.37 [-0.86, 0.13]	-0.22 [-0.69, 0.25]	0.28 [-0.24, 0.80]
Observations	795	803	790	751	763	771
Participants	199	201	198	188	191	193

Note. The table reports unstandardized regression coefficients for each independent variable (row) in each domain (column). Bracketed ranges indicate 95% confidence intervals. *** $p < .001$; ** $p < .010$; * $p < .050$.

Discussion

Information about what something was originally designed for and information about how it is presently used each influenced purpose attributions across all six of the domains we examined. In this respect, the domains are remarkably similar. However, the *sizes* of these effects differed across domains—in some cases rather dramatically. For artifacts and animals, original design and present practice had very similar effect sizes. However, for institutions and human lives, present practice had a larger effect than original design. For sacred objects and body parts, original design had a larger effect than present practice. The most striking contrast was between institutions and sacred objects. If a sacred object was originally designed for some use, then people overwhelmingly consider that use to be the purpose of the object, regardless of whether people have since decided to use the object in a different way. Institutions show the opposite pattern. If the present practice is to use an institution in a particular way, then people generally think that this use reflects the purpose of the institution, regardless of what the institution was originally designed for.

Overall, then, this study found the six domains to be similar at a broad level, but also revealed some important differences in the details. Curiously, these differences between domains did not follow any obvious pattern. For example—picking up on the purported distinction between artifactual and natural purposes mentioned above—one might have expected purpose attributions for human-made things (artifacts and institutions) to look similar to each other, but different from purpose attributions for natural phenomena (animals and body parts) or philosophically or religiously significant purpose attributions (sacred objects and human lives). But that's not what we observed. Instead, judgments about the purposes of artifacts looked most like judgments about the purposes of animals. And judgments about the purposes of human lives looked most like judgments about the purposes of institutions. In other words, the domains seemed to cluster in a surprising, non-systematic way.

Another surprising result was that, in some conditions, the distributions of responses were strongly bimodal (see Figure 1, panel A). For example, when sacred objects were used in ways for which they were not designed, the mean purpose judgment was at the middle of the scale. But this is not because a majority of responses were at the midpoint. Instead, responses were split between the top and bottom of the scale, with relatively few participants being unsure about the object's purpose. Curiously, however, when we look at the level of participants (i.e., the within-person effects), we don't see bimodal distributions (see Figure 1, panel B). This undermines one natural interpretation of the bimodality in individual responses—namely that some participants always treated original design as decisive, whereas others always treated present practice as decisive.

If that were the case, then the within-person effects would have been bimodally distributed as well.

It's not at all clear how to explain this property of the distributions. One possibility might be that people have multiple purpose concepts: in one sense, a purpose is whatever something was originally designed for; and, in another sense, a purpose is whatever something is presently used for. If so, then it might be that each participant possesses both concepts but each of their responses reflects just one of the concepts. In any case, whatever explains this pattern, it is striking that it seems to be emerging in a similar way across domains.

In the next study, we turn to consider the role of morality and effectiveness, where past research might lead one to expect particularly striking differences across domains.

Study 2

This study was similar to Study 1 except that we manipulated whether items from the six domains were being used in morally good or bad ways, and whether the items were effective or ineffective for these uses. As before, the key question was whether these manipulations would affect purpose attributions similarly across domains.

As noted above, a large body of research has found that ordinary ways of thinking about human lives are very closely tied to morality. Because moral considerations affect judgments about meaning in life, one's true self, personal identity, and more (De Freitas et al., 2018; Fuhrer & Cova, 2022; B. Phillips, 2022; Prinzing et al., 2022; Strohminger & Nichols, 2014; Tobia, 2015), moral considerations might also have pronounced effects on judgments about the purpose of a person's life. Hence, in addition to broader differences across domains, we also aimed to test the specific hypothesis that morality would have a

larger effect on judgments about the purposes of human lives than judgments about the purposes of other things, such as artifacts or institutions.

Method

The pre-registration form for this study is available online: https://osf.io/w48rh. There were no deviations from this pre-registration.

Participants. We used the same recruitment methods as in Study 1 and received 1,195 complete responses. After excluding participants (n = 59) who failed more than one comprehension check (same as in Study 1), we were left with 4,544 observations from N = 1,136 participants (M_{age} = 41 years, SD_{age} = 14; 48% identified as men, 50% women, 2% as non-binary or other gender, < 1% prefer not to say; 6% identified as Asian, 8% Black or African American, 8% as Hispanic, 77% White, 6% mixed race, 3% other race or prefer not to say).

Procedure and Measures. The study design was identical to Study 1, except that we used a 6 (Domain) × 2 (Morality: Bad, Good) × 2 (Effectiveness: Ineffective, Effective) factorial design. Table 3 presents an example item from the social institutions domain. In the Bad conditions, the vignettes described the items being used for something morally bad, whereas in the Good conditions the vignettes described them as being used for something morally good. In the Ineffective conditions, the vignettes stated that the items were highly ineffective at what they are being used for. In the Effective conditions, the vignettes described the items as being extremely effective at what they are being used for. To prevent participants from inferring, based on the information provided, what the items were originally designed for or how they are presently used, all vignettes stated

how the items were presently being used and that the items were *not* originally designed for that use. We assessed purpose attributions in the same way as in Study 1.

Table 3: **Example Vignettes from Study 2.**

The Jolly Candy company was started in 1967 by siblings, Joel and Tamar, who learned candy making from their mother. When they first started, their most popular product was a special kind of lollipop called rocket pops. The siblings first created the Jolly Candy company to sell other things, but at some point they decided to concentrate all the company's efforts on rocket pops.	
Bad	*Good*
Rocket pops are very popular, especially among kids, because they contain an addictive substance. The effects on the body are similar to those of cocaine.	Rocket pops are very popular, especially among kids, because they contain a nutritious substance. The effects on the body are similar to those of Vitamin C.
Ineffective	*Effective*
The Jolly Candy proved to be incredibly ineffective at selling rocket pops. In fact, it is worse at this than it is at anything else.	The Jolly Candy proved to be incredibly effective at selling rocket pops. In fact, it is better at this than it is at anything else.
Please indicate the extent to which you agree or disagree with the following statement:	
"The purpose of the Jolly Candy company is to sell rocket pops."	

Note. The text in the first and last rows were constant across conditions. The middle two rows were randomized, with participants reading either the *Bad* or *Good* text and either the *Ineffective* or *Effective* text. The complete set of materials is available online: https://osf.io/y6umw .

Results

Figure 2a presents the means, 95% confidence intervals, and distributions of purpose attributions across conditions. Figure 2b shows the distribution of effect sizes at the participant level. We computed these within-person effects in the same way as in Study 1. We tested for effects of the experimental manipulations across domains using the same analytic methods as in Study 1.

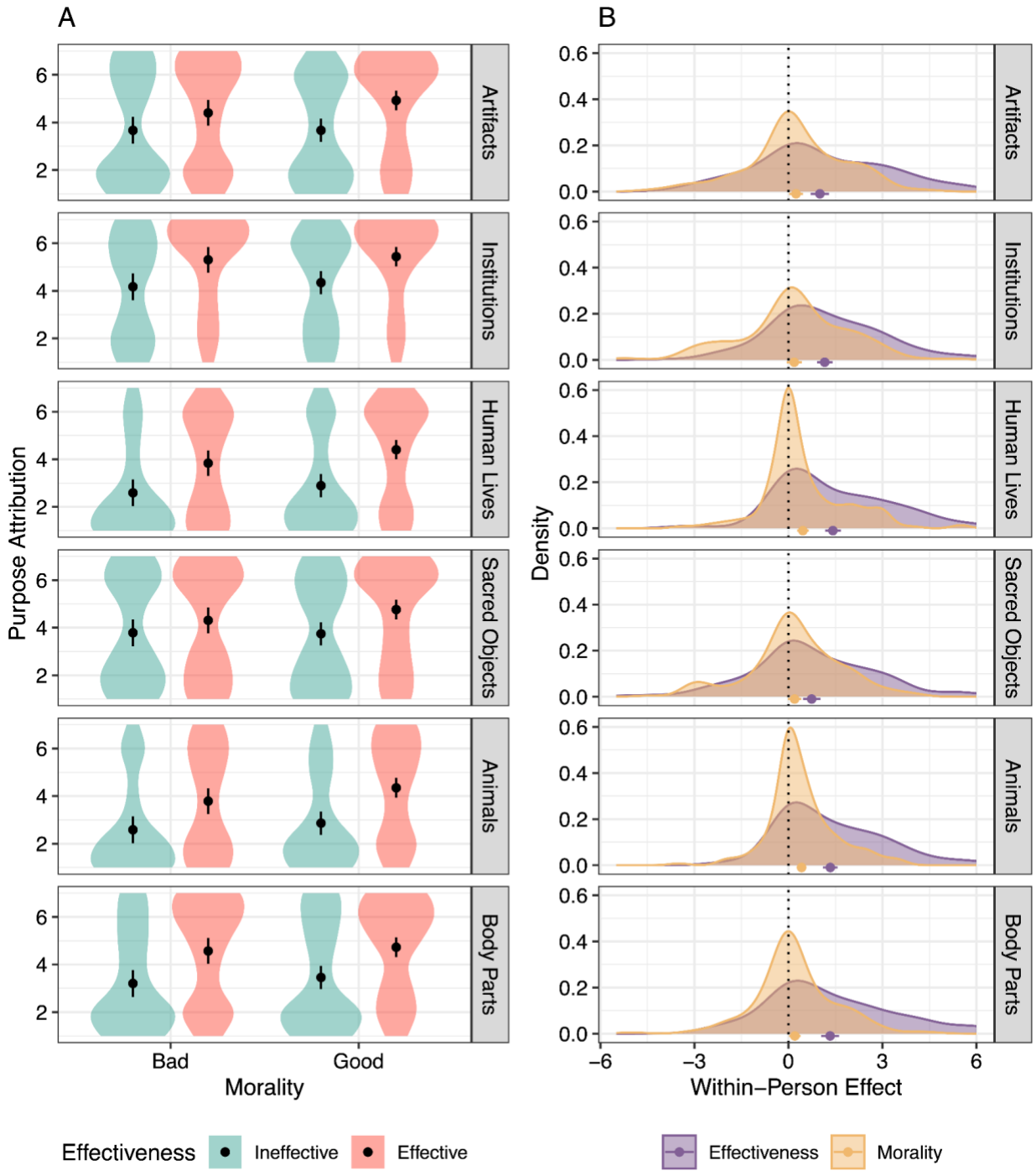

Figure 2: **Results of Study 2.** Panel A presents means across experimental conditions, with 95% confidence intervals and distributions. Panel B presents density plots of the within-person effects of each factor for each domain. Points and error bars are means and 95% confidence intervals.

There were significant effects of Domain, $\chi^2(5) = 18.91$, $p < .001$, Morality, $\chi^2(1) = 11.97$, $p < .001$, and Effectiveness, $\chi^2(1) = 261.91$, $p < .001$. Because the key question

in this analysis was whether the two experimental manipulations had the same or different effects across domains, we were especially interested in the two-way interactions involving Domain. The Domain × Effectiveness interaction was significant, $\chi^2(5) = 10.26$, $p < .001$. However, the Domain × Morality interaction was not, $\chi^2(5) = 1.83$, $p = .767$. To decompose the Domain × Effectiveness interaction, we ran separate mixed-effects regressions for each domain. The results of the domain-specific models are presented in Table 2. Effectiveness had a significant effect on purpose attributions in every domain (all *p*s < .010), though the magnitude of these effects ranged from *b* = 0.52 (95% CI: [0.17, 0.86]) for sacred objects to *b* = 1.37 (95% CI: [1.05, 1.69]) for body parts.

Because we also wanted to test the more specific hypothesis that morality has a larger effect on purpose judgments for human lives than in the other domains, in addition to the primary analysis reported above, we pre-registered an additional test. Specifically, we created a 2-level version of the Domain variable, Human Lives, that contrasted this one domain with all of the others. Yet the overall pattern of results in this model was the same as before. There were significant effects of Human Lives, $\chi^2(1) = 5.02$, $p = .025$, Morality, $\chi^2(1) = 29.52$, $p < .001$, and Effectiveness, $\chi^2(1) = 412.64$, $p < .001$. There was also a Human Lives × Effectiveness interaction, $\chi^2(1) = 5.24$, $p = .022$, but no Human Lives × Morality interaction, $\chi^2(1) = 2.03$, $p = .154$.

Table 4: **Results of Domain-Specific Linear Mixed-Effects Model in Study 2.**

Independent Variable	Domain					
	Artifacts	*Institutions*	*Human Lives*	*Sacred Objects*	*Animals*	*Body Parts*
Morality	0.00 [-0.34, 0.35]	0.18 [-0.12, 0.49]	0.30 * [0.01, 0.59]	-0.05 [-0.39, 0.30]	0.28 * [0.01, 0.54]	0.25 [-0.07, 0.57]
Effectiveness	0.74 *** [0.40, 1.09]	1.13 *** [0.83, 1.44]	1.27 *** [0.97, 1.56]	0.52 ** [0.17, 0.86]	1.21 *** [0.94, 1.48]	1.37 *** [1.05, 1.69]
Morality × Effectiveness	0.52 * [0.03, 1.01]	-0.05 [-0.49, 0.38]	0.26 [-0.16, 0.67]	0.50 * [0.01, 0.99]	0.28 [-0.10, 0.66]	-0.10 [-0.55, 0.36]
Observations	765	764	783	748	739	731
Participants	192	191	196	187	185	183

Note. The table reports unstandardized regression coefficients for each independent variable (row) in each domain (column). Bracketed ranges indicate 95% confidence intervals. *** $p < .001$; ** $p < .010$; * $p < .050$.

Discussion

This study examined the impacts of effectiveness and morality on purpose attributions. We found that if an item is highly effective (versus ineffective) for a particular use, then people are more inclined to think that this use is the item's purpose. We also found that people are more likely to consider morally good uses to be items' purposes than morally bad uses. However, although statistically significant, the effect of morality was extremely small.

The key question in this study is whether these manipulations have the same effect across domains. Considering morality, the results were quite clear: the impact of moral considerations did not vary. We found no significant interaction either across all six domains or in a contrast specifically between human lives and the other domains. Hence, information about whether the candy that a company sells is healthy or laced with drugs, and information about whether fighting a rebellion means fighting for justice or tyranny, had very similar effects on judgments about, respectively, the purpose of the company and the purpose of the person's life. A large body of prior research (summarized above) has found that moral considerations play a major role in all kinds of judgments about

human lives. But these findings suggest that the way that people think about the purpose of a person's life is different. In this case, morality seems to play almost no role at all. Instead, people seem to think the same way about human lives as they do about ordinary physical artifacts.

Considering the effectiveness manipulation, we again observed a very similar pattern of results in each domain. The average effect across the six domains was approximately one point on the 7-point scale, and no domain showed an effect size more than half a point larger or smaller than this. Hence, for example, information about how effective a company is at selling candy, and information about how effective a person is at fighting a rebellion, had very similar effects on, respectively, judgments about the purpose of the company and the purpose of the person's life. Nonetheless, there was a significant interaction between the effectiveness manipulation and domain, suggesting that perhaps the impact of effectiveness does vary across domains, even if only by a little.

One possible explanation for this small interaction could be that the effectiveness manipulation was more successful in some domains than others. That is, even if the impact of effectiveness on purpose judgments is consistent across domains, if the impact of the effectiveness manipulation on effectiveness judgments themselves differed slightly, then this could also lead to slightly different effect sizes for purpose judgments. To investigate this possibility, we conducted Supplemental Study 1 (reported in the Supplemental Materials). The procedure was identical to this study, except that, instead of assessing purpose judgments, we assessed judgments about morality and effectiveness (i.e., used manipulation checks). This revealed that the impact of the manipulations did differ somewhat across domains, and in a way that mirrored the effects

on purpose judgments. Moreover, after accounting for these differences in the impact of the effectiveness manipulation, there was no longer any interaction between domain and effectiveness on purpose judgments. Hence, morality and effectiveness each appear to have consistent effects across domains.

The results of this study stand in striking contrast to those of Study 1, where we observed notable differences in the pattern of results across domains. In light of this, we also conducted Supplemental Study 2 (reported in the Supplemental Materials), which paralleled Study 1. In this case, we assessed judgments about the degree to which each item was originally designed for a particular use and whether it is presently used in that way. Again, we found that the impact of the manipulations on the intended judgments differed somewhat across domains. However, in this case, there was little correspondence between the effect sizes for purpose judgments and for the manipulation checks. Accounting for these differences could not explain the different impacts of the manipulations on purpose judgments. Hence, we were left with a puzzle about why Study 2 provided such clear evidence in favor of the domain-general hypothesis whereas Study 1 seemed to provide at least some evidence against this hypothesis. This prompted us to revisit the effects of original design and present practice in a new study.

Study 3

In Study 1, we found some important similarities in purpose attributions across domains, but also some important differences. For example, it seemed that original design played a fairly decisive role in judgments about the purposes of sacred objects, whereas present practice played a decisive role for judgments about social institutions.

Could these results somehow be compatible with the hypothesis that purposes are attributed in the same ways across domains?

One possibility is that these differences reflect the fact that different kinds of entities tend to be the original designers and present users in different domains. To illustrate, a typical scenario for a sacred object might be one in which a supernatural being creates the object and humans later use it. Indeed, this is how we described the sacred objects in Study 1. Yet, if it is always supernatural beings who create the objects and humans who use them, then perhaps it's *not* the case that original design is more important than present practice. Instead, perhaps the intentions of supernatural beings are considered more important than the intentions of human beings (Barrett, 2012; McCauley & Lawson, 2002). If so, then in a more unusual case where a sacred object is made by a human and then used by a supernatural being, we should see a larger effect of present practice than of original design. More generally, the kinds of entities that usually play the roles of creator and user systematically vary across domains. Body parts are created by natural selection and then used by the organisms that possess them. Artifacts are typically created by people or companies who then sell them, and the present users tend to be the people who own the artifacts.

One approach to testing whether such differences across domains impacted our original results would be to reverse the roles. That is, for each item, we could consider two variants: one in which entity A is the creator and entity B is the user; and another in which B is the creator and A is the user. Reversing the roles will, in some cases, lead to strange scenarios. For example, in the human lives domain, it would involve a person creating their own life (i.e., incarnating themselves, having existed prior to their own birth)

and a supernatural being later using the person's life. Although prior research suggests that people will find such scenarios intuitively understandable (Barrett, 2012; E. Cohen & Barrett, 2008), they certainly represent a break from the ordinary. That is, when people ordinarily think about human lives, for example, they do *not* expect a person to create themselves. Yet, considering these unusual cases enables us to test in a much more controlled way whether the effects of original design and present practice depend on the kinds of entities designing and using the item. And, if they do, this could indicate that the aims of certain kinds of entities are privileged in purpose attributions.

Following this rationale, we used a similar design to Study 1 but with an additional experimental factor. Considering artifacts and institutions, in one condition, the original creators of the items were also the owners of the items. In the other condition, the items were presently used by the owner, but originally created by other people. For human lives and sacred objects, in one condition the original creators were supernatural beings and the present users were humans. In the other condition, the original creators were humans and the present users were supernatural beings. Finally, considering animals and body parts, in one condition the items were created by natural processes and then used by animals or people. In the other condition the items were made by people, and later used by natural processes.

We preregistered two different ways of conducting the analyses.[1] Depending on the results, one or the other approach might be more illuminating. One possible result would be that reversing the roles does not actually have any effect, and original design consistently has a larger impact in some domains and present practice consistently has

[1] We originally pre-registered a plan to report the results of the second approach only in the Supplemental Materials. However, during the review process, we moved these to the main text.

a larger impact in others. If this were the result, then the best approach would be, like in Study 1, to have independent variables for original design, present practice, and domain. The analysis would then highlight how original design and present practice interact with domain. But another possible result would be that there is no such consistent pattern, and reversing the roles completely changes the effects of original design and present practice. To illustrate, consider sacred objects again. It might be that the intentions of the gods always have a large effect and the intentions of human beings always have a small effect, regardless of whether the humans or gods are responsible for the original design or the present practice. If the results come out in this way, then it will be more illuminating to recode the experimental factors so we have independent variables that reflect the intentions of the gods and the intentions of the humans. Not knowing how the results would look, in our analyses, we examined both ways of thinking about the experimental manipulations.

Method

The pre-registration form for this study is available online: https://osf.io/kh8du. There were no deviations from this pre-registration.

Participants. We used the same recruitment methods as in Studies 1-2 and received 1,198 complete responses. After excluding participants (n = 74) who failed more than of these comprehension checks (same as before), we were left with 4,496 total observations from N = 1,124 participants (M_{age} = 42 years, SD_{age} = 14; 49% identified as men, 47% women, and 3% as non-binary, other, or prefer not to say; 7% identified as Asian, 10% Black or African American, 77% White, 4% mixed race, 5% other race, 1% prefer not to say).

Procedure and Measures. The study design was identical to Study 1, except that we added a new experimental factor, manipulating which entities play the roles of original designer and present user. In the usual roles conditions, one person or entity would create the item and another person or entity would be the present user, whereas in the reversed roles conditions, we swapped the roles of these two people or entities. Table 5 presents an example from the social institutions domain. As noted above, there are two ways of coding these experimental conditions. Parallel to Study 1, they can be coded to reflect a 2 (Original Design: Not Designed, Designed) × 2 (Present Practice: Not Presently Used, Presently Used) × 2 (Roles: Usual, Reversed) factorial design. However, they can also be coded to reflect the aims of specific entities. We describe this recoding in detail below. We assessed purpose attributions in the same way as in Studies 1-2.

Table 5: **Example Item from Study 3.**

The Jolly Candy company was started in 1967 by siblings, Joel and Tamara, who learned candy making from their mother. When they first started, their most popular product was a special kind of lollipop called rocket pops.

Usual	*Designed* The siblings wanted to own a company, and happened to know just how to start a business. So, they created the Jolly Candy company all on their own. When the siblings first founded the Jolly Candy company, it was specifically in order to sell rocket pops.	*Not Designed* The siblings wanted to own a company, and happened to know just how to start a business. So, they created the Jolly Candy company all on their own. When the siblings first founded the Jolly Candy company, it was not specifically in order to sell rocket pops, but other things.
	Presently Used Eventually, Joel and Tamara grew too old to manage a business. So, they hired Corporate Holdings to manage the Jolly Candy company for them. Without consulting Joel and Tamara, the people at Corporate Holdings decided to concentrate the company's efforts entirely on rocket pops. They decided never to sell other things.	*Not Presently Used* Eventually, Joel and Tamara grew too old to manage a business. So, they hired Corporate Holdings to manage the Jolly Candy company for them. Without consulting Joel and Tamara, the people at Corporate Holdings decided to abandon the company's efforts entirely on rocket pops. They decided only to sell other things.
Reversed	*Designed* Although the siblings wanted to own a company, they didn't know how to start a business. So they hired Corporate Holdings to create the Jolly Candy company for them. When Corporate Holdings first founded the Jolly Candy company, it was specifically in order to sell rocket pops.	*Not Designed* Although the siblings wanted to own a company, they didn't know how to start a business. So they hired Corporate Holdings to create the Jolly Candy company for them. When Corporate Holdings first founded the Jolly Candy company, it was not specifically created to sell rocket pops, but other things.
	Presently Used Eventually, Joel and Tamara learned to manage a business. So, they took direct control of the Jolly Candy company. Without consulting the people at Corporate Holdings, Joel and Tamara decided to concentrate the company's efforts on rocket pops. They decided never to sell other things.	*Not Presently Used* Eventually, Joel and Tamara learned to manage a business. So, they took direct control of the Jolly Candy company. Without consulting the people at Corporate Holdings, Joel and Tamara decided to abandon the company's efforts on rocket pops. They decided only to sell other things.

Please indicate the extent to which you agree or disagree with the following statement:

"The purpose of the Jolly Candy company is to sell rocket pops."

Note. The text in the first and last rows were constant across conditions. Participants were presented with either the *Usual* or *Reversed* version, reading either the *Designed* or *Not Designed* text and either the *Presently Used* or *Not Presently Used* text. The complete set of materials is available online: https://osf.io/fe8vw.

Results

Effects of Original Design, Present Practice, and Roles. First, we examined the effects of Present Practice, Original Design, Roles, and Domain (along with all interactions) using a single mixed-effects model. Figure 3a presents the means, 95% confidence intervals, and distributions of purpose attributions across conditions. Figure 3b shows the distribution of effect sizes at the participant level, computed in the same way as in Studies 1-2.

There were significant effects of Domain, $\chi^2(5) = 17.51$, $p = .004$, Original Design, $\chi^2(1) = 1398.01$, $p < .001$, and Present Practice, $\chi^2(1) = 1355.52$, $p < .001$, but no effect of Roles, $\chi^2(1) = 0.25$, $p = .620$. Because the key question in this analysis was whether the two experimental manipulations had the same or different effects across domains after accounting for Roles, we were especially interested in the two-way interactions involving Domain. Both were significant: Domain × Original Design, $\chi^2(5) = 28.78$, $p < .001$; Domain × Present Practice, $\chi^2(5) = 102.75$, $p < .001$. Roles also showed significant interactions both with Original Design, $\chi^2(1) = 22.36$, $p < .001$, and Present Practice, $\chi^2(1) = 56.69$, $p < .001$. There were also significant 3-way interactions between Roles, Domain, and both Original Design and Present Practice. However, as per our pre-registration, we did not decompose these higher-order interactions. Instead, we ran a series of domain-specific models using recoded factors that are reported in the Supplemental Materials and discussed below.

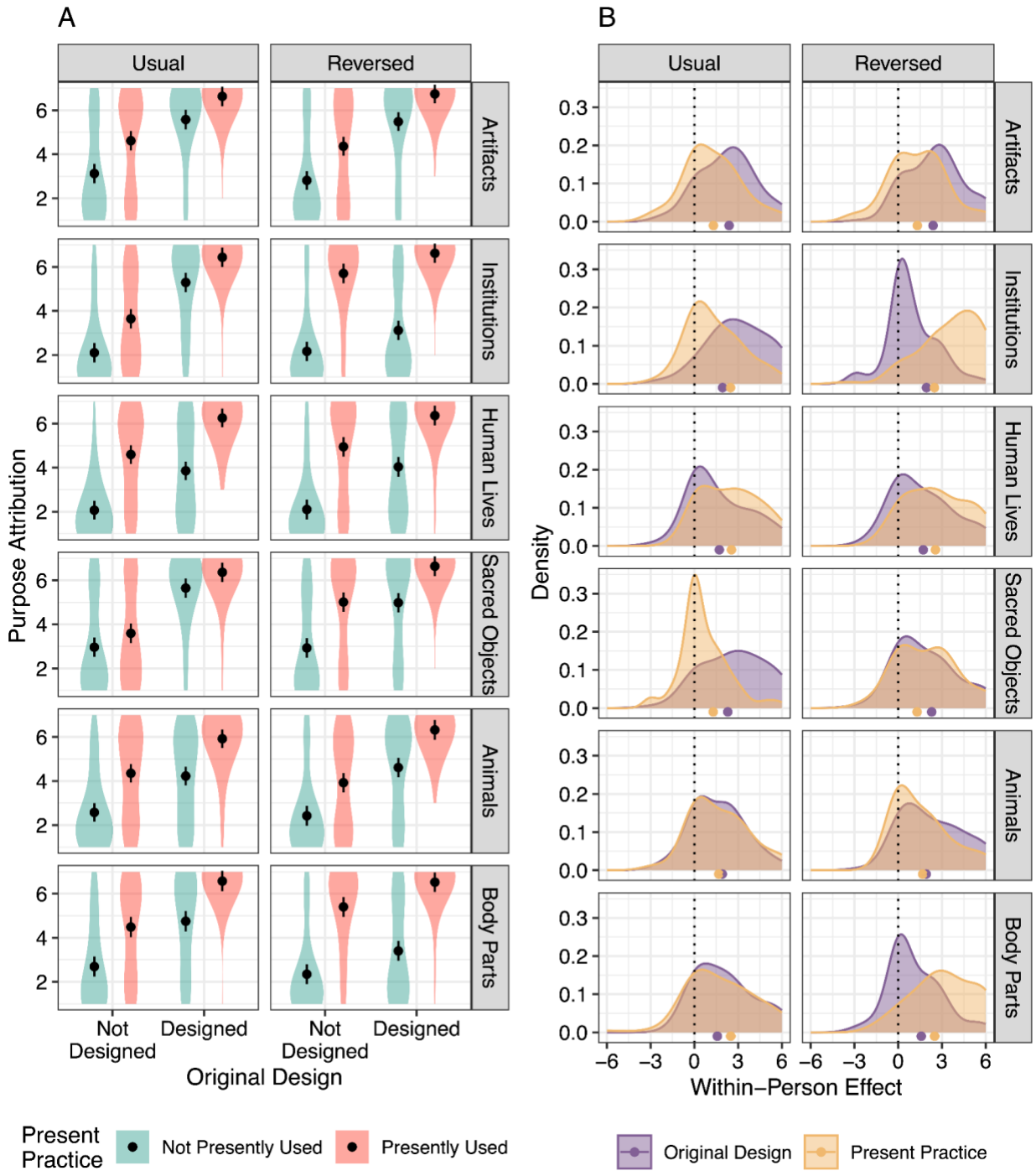

Figure 3: **Results of Study 3.** Panel A presents means across experimental conditions, with 95% confidence intervals and distributions. Panel B presents density plots of the within-person effects of each factor for each domain. Points and error bars are means and 95% confidence intervals.

Table 6: **Effects of each experimental factor for each domain in Study 3.**

	Original Design		Present Practice	
	ΔM	*d [95% CI]*	*ΔM*	*d [95% CI]*
Artifacts				
Usual	2.23	1.27 [1.06, 1.47]	1.27	0.72 [0.52, 0.93]
Reversed	2.52	1.43 [1.24, 1.63]	1.40	0.80 [0.60, 0.99]
Institutions				
Usual	2.99	1.70 [1.49, 1.91]	1.34	0.76 [0.55, 0.97]
Reversed	0.93	0.53 [0.33, 0.74]	3.52	2.00 [1.79, 2.21]
Human Lives				
Usual	1.73	0.98 [0.79, 1.17]	2.46	1.40 [1.21, 1.59]
Reversed	1.68	0.95 [0.74, 1.16]	2.59	1.47 [1.26, 1.68]
Sacred Objects				
Usual	2.73	1.55 [1.34, 1.76]	0.67	0.38 [0.18, 0.59]
Reversed	1.84	1.05 [0.84, 1.25]	1.87	1.06 [0.85, 1.27]
Animals				
Usual	1.61	0.91 [0.73, 1.10]	1.74	0.99 [0.80, 1.18]
Reversed	2.29	1.30 [1.09, 1.51]	1.61	0.91 [0.70, 1.12]
Body Parts				
Usual	2.07	1.18 [0.96, 1.40]	1.81	1.03 [0.81, 1.25]
Reversed	1.09	0.62 [0.41, 0.83]	3.09	1.76 [1.54, 1.97]

Note. The table reports the effects of Original Design and Present Practice at each level of Roles, for each domain. Bracketed ranges indicate 95% confidence intervals. All *p* values are < .001. Unstandardized effect size estimates are given as the difference in estimated marginal means across levels of the respective factor (ΔM). Standardized effect size estimates are given as Cohen's *ds.* We computed these results using the emmeans and eff_size functions from the *emmeans* package (Lenth et al., 2018).

To decompose the 2-way interactions, we used estimated marginal means to examine the effects of each factor in each domain. Both factors had significant effects in all domains at each level of Roles (all *p*s < .001). For some domains, flipping the roles seemed not to make a difference. For example, for artifacts and human lives, the effects

of Original Design and Present Practice were basically identical, regardless of whether participants received a case with the usual roles or reversed roles. This suggests that it is indeed the original design and present practice that matter most here, rather than the aims of specific entities. However, in other domains, the role reversing manipulation completely changed the effects played by each factor. Considering institutions, for example, in the usual roles condition, Original Design had a large effect and Present Practice had a comparatively small effect. However, in the reversed roles condition, Present Practice had a much larger effect and Original Design had a comparatively small effect. Similar patterns of results emerged for sacred objects and body parts, suggesting that the aims of specific entities may play a privileged role in these domains.

Results with recoded factors. We then recoded the experimental factors and analyzed the data using a slightly different approach. For this second approach, we conducted a separate mixed-effects regression for each domain and recoded the independent variables so that there would be a fixed effect reflecting the aims of each type of entity. This approach makes it possible to more easily see whether there is a consistent tendency such that the aims of one type of entity has a larger impact than another type of entity.

For the human lives and sacred objects domains, we recoded the experimental conditions so that there were variables for Supernatural Aim (whether the god intends for the item to be used in a certain way), Human Aim (whether humans intend for the item to be used in that way), and Creator (whether the god or human originally created the item). For artifacts and institutions, there were variables for Owner's Aim (whether the item's owner intends for the item to be used in a certain way), Other's Aim (whether another

person intends for the item to be used in that way), and Creator (whether the owner originally created the item). For animals and body parts, there were variables for Nature's Aim (whether the items evolved to be used in a certain way), People's Aim (whether people currently use the items in that way), and Creator (whether nature originally created the items).

Table 7: Coefficients for recoded factors in each domain.

Independent Variable	Domain	
	Artifacts	*Institutions*
Creator	-0.31 [-0.81, 0.19]	0.06 [-0.41, 0.54]
Owner's Aim	2.45 [1.94, 2.96] ***	3.19 [2.71, 3.67] ***
Other's Aim	1.49 [0.98, 1.99] ***	1.54 [1.06, 2.02] ***
Creator x Owner's Aim	-0.91 [-1.61, -0.21] *	0.35 [-0.33, 1.02]
Creator x Other's Aim	1.18 [0.48, 1.87] ***	-0.58 [-1.26, 0.09]
Owner's Aim x Other's Aim	-0.43 [-1.14, 0.29]	-0.4 [-1.08, 0.28]
Creator x Owner's Aim x Other's Aim	0.15 [-0.84, 1.13]	0.36 [-0.60, 1.31]
	Human Lives	*Sacred Objects*
Creator	0.03 [-0.45, 0.52]	-0.05 [-0.60, 0.49]
Supernatural Aim	1.79 [1.33, 2.26] ***	2.67 [2.14, 3.20] ***
Human Aim	2.53 [2.07, 3.00] ***	0.61 [0.08, 1.14] *
Creator x Supernatural Aim	1.05 [0.37, 1.74] **	-0.59 [-1.34, 0.16]
Creator x Human Aim	-0.6 [-1.28, 0.09]	1.45 [0.70, 2.21] ***
Supernatural Aim x Human Aim	-0.14 [-0.79, 0.52]	0.09 [-0.66, 0.84]
Creator x Supernatural Aim x Human Aim	-0.38 [-1.35, 0.59]	-0.5 [-1.56, 0.56]
	Animals	*Body Parts*
Creator	-0.15 [-0.65, 0.34]	-0.35 [-0.89, 0.18]
Nature's Aim	1.65 [1.19, 2.11] ***	2.06 [1.51, 2.61] ***
People's Aim	1.78 [1.32, 2.24] ***	1.79 [1.25, 2.34] ***
Creator x Nature's Aim	-0.15 [-0.83, 0.54]	1.01 [0.25, 1.77] **
Creator x People's Aim	0.42 [-0.27, 1.10]	-0.73 [-1.49, 0.04]
Nature's Aim x People's Aim	-0.08 [-0.74, 0.57]	0.03 [-0.75, 0.80]
Creator x Nature's Aim x People's Aim	0.29 [-0.68, 1.26]	0.02 [-1.06, 1.10]

Note. This table presents the unstandardized regression coefficients for each of the recoded factors in each domain. * $p < .05$; ** $p < .010$; *** $p < .001$.

The results of these six models are presented in Table 7. In certain domains, this approach of focusing on the aims of specific entities appears to be illuminating. For

example, considering institutions, Owner's Aim has a far larger effect (b = 3.19) than Others' Aim (b = 1.54). And, considering sacred objects, Supernatural Aim (b = 2.67) is far larger than that of the Human Aim (b = 0.61). In other words, when attributing purposes to social institutions and sacred objects, people seem to give special priority to the intentions of owners and supernatural beings, respectively.

Discussion

In Study 1, we found that original design and present practice had substantially different effects on purpose judgments in different domains. In this study, we tested whether this result arises because of differences in the kinds of entities that usually create and use items in each domain. If the impact of original design and present practice depends on which entities create and use the items, then, rather than focus on what something was originally designed for and how it's presently used, it might make more sense to focus on the aims or intentions of specific entities.

Consider sacred objects and institutions. In discussing the results from Study 1, we focused on these two domains because they showed the most striking contrast. Institutions showed a far larger effect of present practice than original design, whereas sacred objects showed the opposite pattern. In this study, we found that these striking differences depend entirely on which kinds of entities create and use items in each of these domains. That is, it's not that present practice plays a privileged role in people's judgments about the purposes of institutions. Instead, people privilege the intentions of the *owners* of institutions, and the owners are also usually the present users. Similarly, it's not that original design plays a privileged role in judgments about the purposes of sacred objects. Rather, the intentions of *supernatural* beings are privileged over the

intentions of human beings. In other words, these entities seem to be treated as authorities within the respective domains.

Looking across the six domains, there are only two where we don't see this sort of pattern. Specifically, artifacts showed a somewhat larger effect of original design than present practice, whereas human lives showed the reverse pattern, and these results did not depend on which entities created or used the items. Thus, although the gods seem to be given special authority when it comes to the purposes of sacred objects, they aren't given such authority over the purposes of human lives. And, although owners are given authority over the purposes of institutions, they aren't given such authority over the purposes of artifacts. It's possible that people give special authority to entities other than the ones we focused on in these domains. For example, when attributing purposes to human lives, it might be that, instead of supernatural beings, people give special authority to the individual human in question. Future research could explore this idea.

In short, the most striking differences that we observed across domains in Study 1 appear to result from details about which agents usually act as the creators versus users of the items. This suggests that the differences we originally observed don't reflect differences in the importance of original design and present practice across domains. Instead, they reflect inter-domain differences in the kinds of entities that usually play the roles of designer and user. These results also suggest an intriguing new idea about how people attribute purposes—namely, that judgments about an item's purpose are importantly shaped by antecedent judgments about who or what has authority over the item.

General discussion

The central question addressed in this paper is whether people reason about purposes similarly across domains, or whether the patterns in their judgments differ from one domain to the next. We investigated this question in three experiments by examining the impact of four different factors in six different domains. Study 1 found that, although original design and present practice each influence purpose attributions in all domains, the relative importance of each factor varies substantially across domains. Study 2 found that morality and effectiveness each influence purpose attributions in the same way across all six domains. Study 3 returned to original design and present practice and examined the influence of the kinds of agents or entities that play the roles of original designer and present user. This revealed that the most notable inter-domain differences in the impact of these factors disappeared after accounting for these roles.

If this domain-general view does turn out to be correct, it would build a bridge between psychological phenomena that might initially appear to be almost entirely unrelated. On one hand, people have an ability to attribute purposes to ordinary artifacts (e.g., determining that one knife is for slicing bread, and another is for chopping vegetables). A large body of highly detailed, technical research has explored the nature and development of this ability (Chaigneau et al., 2008; Defeyter et al., 2009; German & Johnson, 2002; Joo et al., 2021; Matan & Carey, 2001; Siegel & Callanan, 2007). On the other hand, people have an ability to think about purposes that seem more deeply meaningful. For example, a separate body of research has explored the ways in which people wrestle with questions about the purpose of their lives (Baumsteiger et al., 2022; Boreham & Schutte, 2023; Bronk et al., 2009), specific important events in their lives

(Banerjee & Bloom, 2015; Scheier & Carver, 2001), and even the purpose of humanity itself (Lewry et al., 2023). The domain general view would create a link between these two. It would suggest that all of the detailed, technical work that has been done on the criteria used in attributing purposes to ordinary artifacts can also be applied to attributions of purposes in more deeply meaningful contexts.

The domain-generality of purpose attributions

When considering the domain-generality of purpose attributions, we can distinguish between two questions: (1) whether purpose attributions are sensitive to the same criteria in each domain; and (2) whether the effect of each criterion is the same across domains. Figure 4 summarizes the findings across studies by plotting the effects of the four factors we examined across domains and studies.

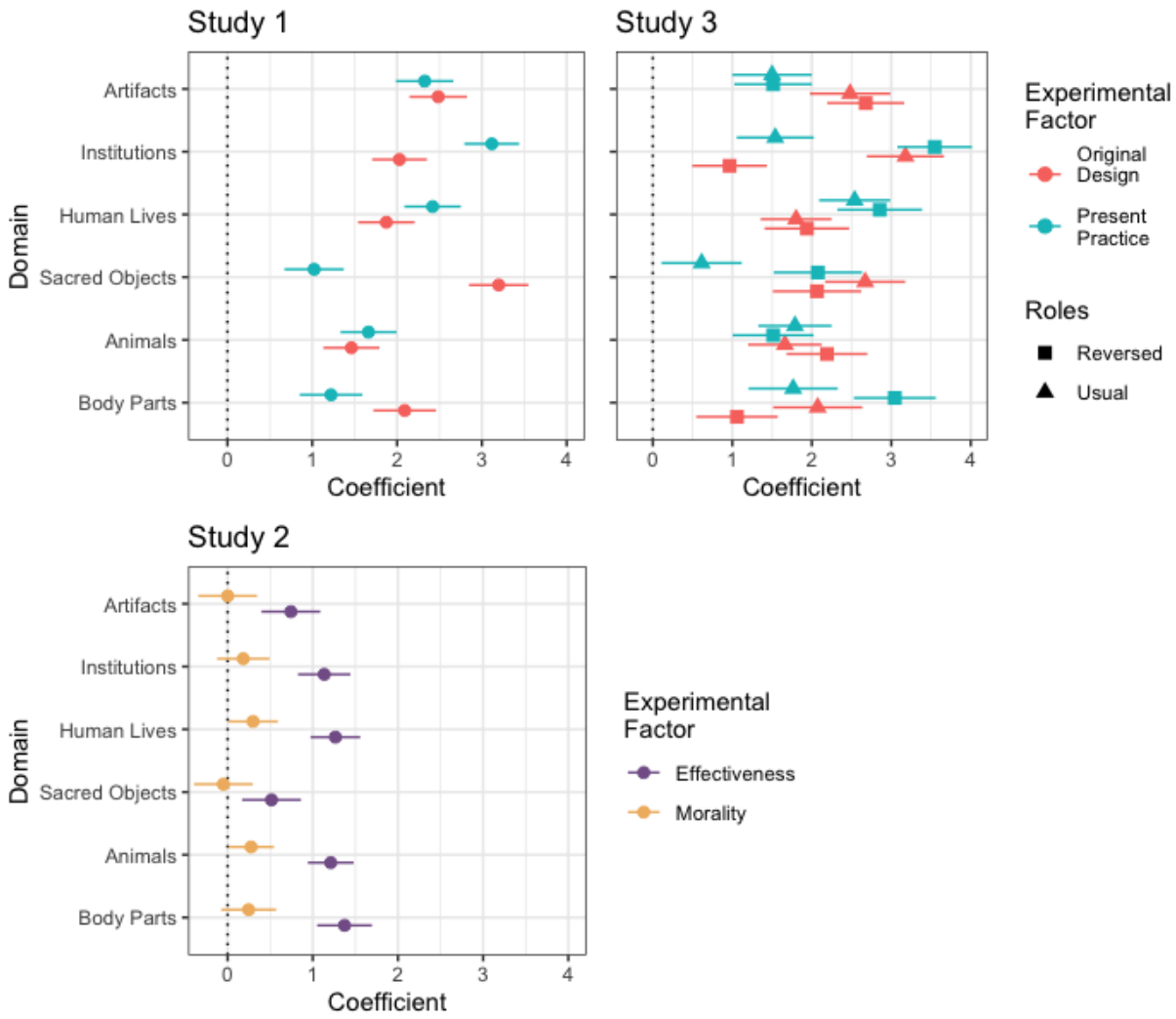

Figure 4: **Effects of experimental factors across domains.** Points and error bars indicate raw regression coefficients and 95% confidence intervals.

Considering effectiveness and morality, the answer to both of these questions appears to be "Yes." As illustrated in Figure 4, across domains, effectiveness has a moderate impact and morality has very little impact. That is, people's judgments about purposes are substantially affected by whether something is good or bad at achieving a particular goal, but only negligibly affected by whether the goal itself is good or bad. This result is somewhat surprising in itself, but it is made all the more striking by the fact that this same result emerges in every domain. Past research provides strong reasons to think that human lives specifically would differ from the other domains in that it would show an

impact of morality (Baumsteiger et al., 2022; Bronk et al., 2023). But, instead, judgments about the purposes of human lives ended up being extremely similar to purpose judgments in the other domains. These findings lend some support to the domain-general hypothesis.

Considering original design and present practice, both of these criteria had substantial effects on purpose judgments in all six domains. This is another point in favor of the domain-general hypothesis. However, it initially seemed (in Study 1) that the impact of these factors was very different across domains. For example, consider sacred objects. As shown in Figure 4, people's judgments were shaped primarily by what the object was originally designed for, and only modestly by how it is presently used. For social institutions, by contrast, people's judgments were shaped largely by how the institution is presently used, and less so by what it was originally designed for. This difference was a point in favor of the domain-specific hypothesis.

But the results of Study 3 suggest that there is something more complex afoot. Specifically, those results suggest that what appeared to be a difference in the importance of original design and present practice is actually something else entirely. For example, it is not the case that people consistently assign more importance to original design when making judgments about sacred objects. Rather, people seem to give special significance to the aims of the gods when deciding on the purposes of sacred objects. In cases where an object was originally designed by the gods and is presently used by human beings, it might appear as though participants are focusing especially on original design. But this initial appearance is misleading. In cases where the object was originally created by human beings and is now being used by the gods (see the "Reversed Roles" points in

Figure 4), people think that the purpose of the object aligns with how it is presently being used. Judgments about institutions show a similar pattern. In cases where the agent presently using the institution is the owner of the institution, it might appear as though participants are focusing especially on present practice. But the results suggest that what is really happening is that participants focus on the aims of the agent who owns the institution, regardless of whether the agent is the original creator or present user. In short, the Study 3 results suggest that the impacts of original design and present practice do not seem to be differing across domains in the way it initially appeared.

Indeed, the Study 3 results seem to be pointing to a further respect in which purpose attributions in the different domains are actually surprisingly similar. Across a number of domains, we find that a specific sort of entity plays a special role in shaping purpose attributions (the gods for sacred objects, the owners for institutions, etc.). This result might point to a deeper similarity across domains, which we explore further in the next subsection.

Curiously, however, in two domains (artifacts and human lives) we found a different pattern of results. Specifically, in these two domains, the effects of original design and present practice seem not to depend on which entities play the roles of designer and user. It may be that there is something importantly different about artifacts and people's lives, compared with the other four domains, such that people reason about their purposes differently. Yet the results of Study 3 offer at least some reason to suspect otherwise. Most of the differences between domains observed in Study 1 seemed to disappear when we accounted for which entities play the roles of original designer and present user. Perhaps further investigation would reveal other factors that could explain what's going

on with artifacts and human lives. If there are other things that vary idiosyncratically across domains, but that don't reflect core or essential features of those domains, then one or more of these things might explain why judgments about artifacts and human lives seem to be operating differently.

In short, the answer to our first research question, about whether purpose attributions in all six domains are sensitive to the same criteria, appears to be "Yes." The answer to the second question, about whether each criterion has a similar impact across domains, is more tentative. Initially, it seemed that the answer was "Yes" for effectiveness and morality, but "No" for original design and present practice. However, the results of Study 3 suggest that original design and present practice might also have the same effect across domains once one accounts for domain-specific idiosyncrasies, such as who plays the role of designer and user. Overall, these findings provide some striking evidence in favor of the domain-general hypothesis.

People may use other criteria when attributing purposes, besides the four that we examined. Just as one illustration, another possible factor studies could examine would be "direction of change." It might be that when an object comes to have more and more of a certain quality over time, people are inclined to think that the purpose of the object is to have this quality, whereas when an object comes to have less of a quality over time, people are inclined to think that this is not the purpose of the object. Additional factors like this one provide a further opportunity for testing the hypothesis we have been exploring here. If it is indeed the case that the criteria for purpose attributions do not differ across domains, then all of these additional factors should also show the same impact across different domains.

Additionally, there might be other approaches to testing this hypothesis besides looking at the criteria used in purpose judgments. For example, there may be inter-domain differences in the practical utility of attributing a purpose, or the degree to which people think an item's purpose can change. There are also different ways of assessing purpose judgments. For example, researchers might ask people to explain what they think is the purpose of an item, and then classify the written responses. It is possible that, approaching the question in these other ways, future studies might find evidence of domain-specificity.

The role of authorities

Although the primary question behind the present studies was the degree to which purpose attributions are similar or different across domains, these studies also uncovered a surprising effect whereby certain specific entities seem to play privileged roles in determining purpose attributions. That is, people show a clear tendency to treat these entities as having *authority* over the item in question. For example, when it comes to corporations, people seem to see the *owner* as the authority. Regardless of whether the owner is the one who originally created the corporation or the one who is presently using it, people tend to attribute purposes based on the owner's intentions. Similarly, when it comes to sacred objects, people tend to see the *gods* as the authorities. Regardless of whether a god is the one who originally created the object or the one who is presently using it, people tend to attribute purposes based on the god's intentions.

It isn't entirely clear from the present findings whether this phenomenon occurs in all domains, or if there is some better explanation for our results. But, if this is what's going on, it would have substantial implications for the study of purpose attributions. Much

of the existing research on this topic has focused on the impacts of original design and present practice. But we may have discovered that this is not the most important distinction here. It might be that what makes a particular agent relevant to ordinary reasoning about purposes is not whether that agent is the one who originally designed the object or the one who is presently using the object. Instead, it might be that what makes an agent especially relevant is whether that agent is seen as the *authority* for that object.

As one illustration of the explanatory power of this idea, consider the way it might be used to explain the bimodal distributions we initially commented on in the Discussion for Study 1. One explanation for this pattern might be that people's responses are sometimes based on original design and sometimes based on present practice. However, another possibility is that people's responses are always based on authority, and that the bimodal distribution then arises because it is often hard to know which entity is the authority for a particular object. For example, when people are thinking about the purpose of a human being who was created by a god, some people might think that the relevant authority is the god whereas others might think it is the human being herself. Thus, the notion of authority might help us to explain why some of these cases seem so confusing or difficult.

Constraints on generality

Given that these studies were conducted in English with US-based adults, we expect that the findings will generalize to this population. Future research might examine whether similar results emerge across cultures and languages. For instance, one thing that might vary is which kinds of entities are treated as authorities in particular domains

(e.g., in some cultures, owners may have less significance in shaping purpose attributions for social institutions). We have no reason to believe that the results depend on other characteristics of the participants, materials, or context.

Conclusion

Taken together, these studies suggest that the factors that influence purpose attributions are strikingly similar across domains. It is possible that other factors, which we did not consider here, have domain-specific effects. But the present findings suggest that the criteria people use when thinking about the purpose of an ordinary artifact like a chair or a knife are very similar to the criteria they use when thinking about the purpose a body part like a hand or a heart, or even when they are thinking about more deeply meaningful questions such as the purpose of a person's life.

If teleological reasoning does operate in a consistent way across domains, then this is a really remarkable result. On the one hand, some theoretical work suggests that we should find this kind of domain-generality (Kelemen & Rosset, 2009; Rose, 2022). But, on the other hand, it is highly counterintuitive that there would be a fundamental similarity between, for instance, the purpose of one's life and the purpose of one's chair. This conclusion, if correct, would have dramatic implications for future research. Whereas reasoning about the purposes of ordinary artifacts seems relatively straightforward, reasoning about religiously or philosophically significant purposes—such as the purpose of life—seems complex and impenetrable. Yet, if the criteria for purpose attributions are domain-general, then insight into the more profound forms of teleological reasoning might be gained by considering findings from research on more mundane forms of teleological

reasoning. To understand how people reason about the purpose of a life, perhaps one should begin by considering how people reason about the purpose of a knife.

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Appendix: Example vignettes from each domain

Study 1

Artifacts

Doctor Winters has a kit of surgical tools that she takes with her whenever she performs delicate operations. One of the tools is a scalpel with a distinctive shape that enables it to cleanly slice tissue around arteries, without cutting the arteries themselves. This keeps patients from bleeding out.

Designed	***Not Designed***
The company that manufactured these tools specially created this scalpel to slice tissue around arteries. They designed it for just that application.	The company that manufactured these tools did *not* specially create this scalpel to slice tissue around arteries. They designed it for other applications.
Used	***Not Used***
Doctor Winters often performs operations that require delicate work near arteries, and she always uses this special scalpel. This is because, after some reflection about it, Doctor Winters decided to use this scalpel exclusively in this way.	Doctor Winters often performs operations that require delicate work near arteries, but she does not use this special scalpel. This is because, after some reflection about it, Doctor Winters decided to use this scalpel exclusively in other ways.

Question: The purpose of Doctor Winter's scalpel is to slice tissue around arteries.

Human lives

Arcadia was in a state of civil war. The government and the rebellion had reached a stalemate. Marcus, a high ranking general, had always been loyal to the government. But he had a deep knowledge of the rebels and their strategies.

Designed	***Not Designed***
Though few knew about this, Marcus was created by a powerful, god-like being. This being created him with the specific goal that he put an end to the rebellion.	Though few knew about this, Marcus was created by a powerful, god-like being. This being created him with the goal that he do something other than end to the rebellion.
Used	***Not Used***
After some reflection about his life, Marcus decided to devote himself to ending the rebellion. He did everything he could to put an end to the rebellion.	After some reflection about his life, Marcus decided against devoting himself to ending the rebellion. He did nothing to put an end to the rebellion

Question: The purpose of Marcus' life is to put an end to the rebellion.

Sacred objects

The Tablets of Concord sit in a temple in Arcadia. The tablets have been stored in this temple for longer than anyone can remember. In ancient times, the tablets were engraved with a mysterious kind of writing that was read aloud at festivals honoring the god Mardan.

Designed	***Not Designed***
In fact, Mardan himself crafted the Tablets of Concord. When he created them, he intended for them to be read aloud at these festivals.	In fact, Mardan himself crafted the Tablets of Concord. When he created them, however, he intended that they be used for something other than reading aloud at these festivals.
Used	***Not Used***
At some point, the priests got together and thought about what to do with the Tablets of Concord. They decided to use them only for reading aloud at festivals. Indeed, the priests made the decision never to use the tablets for other things.	At some point, the priests got together and thought about what to do with the Tablets of Concord. They decided not to use the tablets for reading aloud at festivals. Instead, the priests made the decision to only use the tablets for other things.

Question: The purpose of the Tablets of Concord is to be read aloud at festivals honoring Mardan.

Animals

Vulpan is a mysterious animal native to a rainforest called Xola. Vulpan is very similar to a bee, except that it is far larger and has a tail. Vulpan lives in a hollowed-out log and people have found that it can be used to pollinate flowers.

Designed

Vulpan is a product of evolution, which created animals like Vulpan to pollinate flowers.

Not Designed

Vulpan is a product of evolution, which created animals like Vulpan, not to pollinate flowers, but for something else.

Used

Today, the people of Xola would only use Vulpan for pollinating flowers. They have declared that Vulpan will never be put to alternative uses.

Not Used

Today, the people of Xola would never use Vulpan for pollinating flowers. They have declared that Vulpan will only be put to alternative uses.

Question: The purpose of Vulpan is to pollinate flowers.

Body parts

Pamvir lives on a planet in a faraway galaxy. Her species is technologically advanced, though they look very different from humans. Most notably, Pamvir's species has very large, highly sensitive ears. Like bats with echolocation, they can use their large ears to track others, even in the dark.

Designed

Pamvir's large ears are a product of natural selection, which led to their emergence in order for animals like Pamvir to track others.

Not Designed

Pamvir's large ears are a product of natural selection. Yet, they did not emerge in order for animals like Pamvir to track others, but rather for something else.

Used

Pamvir often tracks others with her large ears. This is because, after some reflection about her ears, Pamvir decided to use them solely in this way.

Not Used

Pamvir does not track others with her large ears. This is because, after some reflection about her ears, Pamvir decided to use them solely for other things.

Question: The purpose of Pamvir's large ears is to track others.

Study 2

Artifacts

Tamara Winters has a kit of special surgical tools in a fine leather bag. One of the tools is a scalpel with a distinctive shape that enables it to cleanly slice tissue around arteries, without cutting the arteries themselves. The company that manufactured these tools did not specially create this scalpel to slice tissue around arteries, but Tamara Winters has decided to use this scalpel exclusively in this way.

Bad

Slicing tissue around the arteries is vital for Tamara to keep her kidnapped victims from bleeding out. This is the only way to prolong the intense suffering.

Good

Slicing tissue around the arteries is vital for Tamara to keep her patients from bleeding out. This is the only way to keep them alive during tricky operations.

Ineffective

Tamara's scalpel is almost unusable for slicing tissue around arteries. It is hard even to imagine a tool that would be less effective.

Effective

Tamara's scalpel is perfect for slicing tissue around arteries. It is hard even to imagine a tool that would be more effective.

Question: The purpose of Tamara Winter's scalpel is to slice tissue around arteries.

Human lives

Arcadia is in a state of civil war, with the government and the rebellion at a stalemate. Marcus is a high ranking general. Though few know this, Marcus was created by a god-like being with some goal in mind. This goal was not ending the rebellion, yet Marcus has decided to devote himself to fighting the rebels, doing everything he can to end the rebellion.

Bad	***Good***
The people of Arcadia have suffered greatly from the government. The rebellion strives to replace the tyrannical dictatorship with a just democracy. If the rebellion dies, so does the people's hope for freedom. They will have to continue living in terror.	The people of Arcadia have suffered greatly from the rebels. The rebellion strives to replace the just democracy with a tyrannical dictatorship. If the rebellion dies, so does the people's fear of tyranny. They will no longer have to live in terror.
Ineffective	***Effective***
Marcus is extremely bad at fighting the rebels. In fact, no one could be less capable of putting an end to the rebellion.	Marcus is extremely good at fighting the rebels. In fact, no one could be more capable of putting an end to the rebellion.

Question: The purpose of Marcus' life is to put an end to the rebellion.

Sacred objects

The Tablets of Concord sit in a temple in Arcadia, and have been there for longer than anyone can remember. In ancient times, the tablets were engraved with a mysterious kind of writing that was read aloud at festivals honoring the god Mardan. Although Mardan himself created the tablets for another use, the priests today have decided to use them exclusively for reading aloud at festivals.

Bad

At these festivals, the people choose someone to be sacrificed, throwing stones on them and shouting insults. Reading the Tablets of Concord gives these festivals the weighty feeling of Mardan's authority, motivating the people to continue all the more intensely.

Good

At these festivals, the people choose someone to be honored, throwing flowers on them and shouting praises. Reading the Tablets of Concord gives these festivals the weighty feeling of Mardan's authority, motivating the people to continue all the more intensely.

Ineffective

Yet, the Tablets of Concord proved to be difficult to read aloud at festivals. In fact, they were less usable for this than they were for anything else.

Effective

The Tablets of Concord proved to be easy to read aloud at festivals. In fact, they were more usable for this than they were for anything else.

Question: The purpose of the Tablets of Concord is to be read aloud at festivals.

Animals

Vulpan is a mysterious animal native to a rainforest called Xola. Vulpan is very similar to a bee, except that it is far larger and has a tail. Vulpan lives in a hollowed-out log and people have found that it can be used to pollinate Bolo flowers. Evolution did not create animals like Vulpan to pollinate Bolo flowers, but today people in Xola would only use Vulpan for pollinating Bolo flowers.

Bad

Bolo flowers are beautiful but highly toxic. Children who pick them die slow, painful deaths. If people didn't use Vulpan to pollinate the flowers, then this wouldn't happen.

Good

Bolo flowers are beautiful and fragrant. Children who pick them make lovely bouquets. If people didn't use Vulpan to pollinate the flowers, then this wouldn't happen.

Ineffective

Vulpan is almost useless for pollinating Bolo flowers. It is hard even to imagine an animal that would be worse at this.

Effective

Vulpan is perfect for pollinating Bolo flowers. It is hard even to imagine an animal that would be better at this.

Question: The purpose of Vulpan is to pollinate Bolo flowers.

Body parts

Pamvir lives on a planet in a faraway galaxy. Her species is technologically advanced, though they look very different from humans. Most notably, Pamvir's species has very large, highly sensitive ears. Like bats with echolocation, they can use their large ears to track others, even in the dark. Although they did not evolve for animals like Pamvir to track others, Pamvir has Pamvir decided to use her large ears solely in this way.

Bad

Tracking others with one's ears is an easy way to spy on them. This is especially useful for learning people's secrets and then blackmailing them.

Good

Tracking others with one's ears is an easy way to keep them safe. This is especially useful for letting kids play freely while also keeping them from harm.

Ineffective

Pamvir's large ears are extremely bad at tracking others. Pretty much nothing could have been worse suited for tracking.

Effective

Pamvir's large ears are extremely good at tracking others. Pretty much nothing could have been better suited for tracking.

Question: The purpose of Pamvir's large ears is to track others.

Study 3

Artifacts

Doctor Winters works for a local hospital where she leads a team of surgeons. Whenever the team performs operations, they always use a kit of special surgical tools. One of these, the #4 scalpel, has a distinctive shape that enables it to cleanly slice tissue around arteries, without cutting the arteries themselves. This keeps patients from bleeding out.

Usual Roles		**Reversed Roles**	
Designed	*Not Designed*	*Designed*	*Not Designed*
The hospital, which owns the tools along with the rest of the facilities, specially manufactured the #4 scalpel to slice tissue around arteries. They designed it to be used exclusively for that application.	The hospital, which owns the tools along with the rest of the facilities, did not specially manufacture the #4 scalpel to slice tissue around arteries. They designed it to be used exclusively for other applications.	Doctor Winters specially manufactured the #4 scalpel to slice tissue around arteries. She designed it to be used exclusively for just that application.	Doctor Winters did not specially manufacture the #4 scalpel to slice tissue around arteries. She designed it to be used exclusively for other applications.
Used	*Not Used*	*Used*	*Not Used*
When the surgeons perform operations that require delicate work near arteries, they always use the #4 scalpel. This is because, after some deliberation about it, Doctor Winters decided to ensure that the #4 scalpel is used exclusively in this way.	When the surgeons perform operations that require delicate work near arteries, they never use the #4 scalpel. This is because, after some deliberation about it, Doctor Winters decided to ensure the #4 scalpel is used exclusively in other ways.	When the surgeons performs operations that require delicate work near arteries, they always use the #4 scalpel. This is because, after some deliberation about it, the hospital, which owns the tools along with the rest of the facilities, decided to use the #4 scalpel exclusively in this way.	When the surgeons perform operations that require delicate work near arteries, they never use the #4 scalpel. This is because, after some deliberation about it, the hospital, which owns the tools along with the rest of the facilities, decided to ensure the #4 scalpel is used exclusively in other ways.

Question: The purpose of the #4 scalpel is to slice tissue around arteries.

Human lives

Arcadia was in a state of civil war. The government and the rebellion had reached a stalemate. Marcus, a high ranking general, had always been loyal to the government. But he had a deep knowledge of the rebels and their strategies.

Usual Roles		**Reversed Roles**	
Designed	*Not Designed*	*Designed*	*Not Designed*
Though few knew about this, Marcus was materialized into human form by a powerful god-like being. This being created him with the specific goal that he put an end to the rebellion.	Though few knew about this, Marcus was materialized into human form by a powerful god-like being. This being created him with the goal that he do something other than end the rebellion.	Though few knew about this, Marcus was once a spirit who materialized himself into human form. He created himself with the specific goal that he put an end to the rebellion.	Though few knew about this, Marcus was once a spirit who materialized himself into human form. He created himself with the goal that he do something other than end the rebellion.
Used	*Not Used*	*Used*	*Not Used*
Marcus reflected on his life and decided to devote himself to ending the rebellion. He did everything he could to work towards the end of the rebellion.	Marcus reflected on his life and decided against devoting himself to ending the rebellion. He did nothing to work towards the end of the rebellion.	A powerful, god-like being reflected on Marcus' life and decided to make sure that Marcus devoted himself to ending the rebellion. He made it so that Marcus did everything he could to work towards the end of the rebellion.	A powerful, god-like being reflected on Marcus' life and decided to make sure that Marcus didn't devote himself to ending the rebellion. He made it so that Marcus did nothing to work towards the end of the rebellion.

Question: The purpose of Marcus' life is to put an end to the rebellion.

Sacred objects

The Tablets of Concord sit in a temple in Arcadia. The tablets have been stored in this temple for longer than anyone can remember. In ancient times, the tablets were engraved with a mysterious kind of writing that was read aloud at festivals honoring the god Mardan.

Usual Roles

Designed

It was Mardan himself who crafted the Tablets of Concord. When he created the tablets, he intended for them to be read aloud at these festivals.

Used

At some point, the priests got together and thought about what to do with the Tablets of Concord. They decided that the tablets would only be used only for reading aloud at festivals. Indeed, they ensured that the tablets would never be used for other things.

Not Designed

It was Mardan himself who crafted the Tablets of Concord. When he created the tablets, however, he intended that they be used for something other than reading aloud at these festivals.

Not Used

At some point, the priests got together and thought about what to do with the Tablets of Concord. They decided that the tablets would never be used for reading aloud at festivals. Instead, they ensured that the tablets would only be used for other things.

Reversed Roles

Designed

It was the priests who crafted the Tablets of Concord. When they created the tablets, the priests intended for them to be read aloud at these festivals.

Used

At some point, Mardan himself sat down and thought about what to do with the Tablets of Concord. He decided that the tablets would only be used only for reading aloud at festivals. Indeed, he ensured that the tablets would never be used for other things.

Not Designed

It was the priests who crafted the Tablets of Concord. When they created the tablets, however, the priests intended that they be used for something other than reading aloud at these festivals.

Not Used

At some point, Mardan himself sat down and thought about what to do with the Tablets of Concord. He decided that the tablets would never be used for reading aloud at festivals. Instead, he ensured that the tablets would only be used for other things.

Question: The purpose of the Tablets of Concord is to be read aloud at festivals honoring Mardan.

Animals

Vulpans are mysterious animals native to a rainforest called Xola. Vulpans are very similar to bees, except that they are far larger and have tails. They live in hollowed-out logs and in the past people would use them to pollinate flowers.

Usual Roles		**Reversed Roles**	
Designed	*Not Designed*	*Designed*	*Not Designed*
Vulpans are a product of natural selection. Evolution created Vulpans to pollinate flowers.	Vulpans are a product of natural selection. Yet, evolution did not create Vulpans to pollinate flowers, but for something else.	Vulpans are a product of genetic engineering. The people of Xola created Vulpans to pollinate flowers.	Vulpans are a product of genetic engineering. Yet, the people of Xola did not create Vulpans to pollinate flowers, but for something else.
Used	*Not Used*	*Used*	*Not Used*
Today, Vulpans only pollinate flowers. The people of Xola have made it so that Vulpans never actually do anything else.	Today, Vulpans never pollinate flowers. The people of Xola have made it so that Vulpans only do other things.	Today, Vulpans only pollinate flowers. Evolution by natural selection has made it so that Vulpans never actually do anything else.	Today, Vulpans never pollinate flowers. Evolution by natural selection has made it so that Vulpans only do other things.

Question: The purpose of Vulpans is to pollinate flowers.

Body parts

Pamvirs live on a planet in a faraway galaxy. Their species is technologically advanced, though they look very different from humans. Most notably, Pamvirs' have very large, highly sensitive ears. Like bats with echolocation, they can use their large ears to track others, even in the dark.

Usual Roles		**Reversed Roles**	
Designed	*Not Designed*	*Designed*	*Not Designed*
Pamvirs' large ears are a product of natural selection. Evolution created the Pamvirs' large ears to track others.	Pamvirs' large ears are a product of natural selection. Yet, evolution did not create the Pamvirs' large ears to track others, but rather for something else.	Pamvirs' large ears are a product of recombinant DNA technology. The Pamvirs created their large ears to track others.	Pamvirs' large ears are a product of recombinant DNA technology. Yet, the Pamvirs did not create their large ears to track others, but rather for something else.
Used	*Not Used*	*Used*	*Not Used*
Pamvirs often track others with their large ears. This is because, after some reflection about their ears, the Pamvirs decided to use them solely in this way.	Pamvirs do not track others with their large ears. This is because, after some reflection about their ears, the Pamvirs decided to use them solely for other things.	Pamvirs often track others with their large ears. This is because, after many years, evolution ensured that the Pamvirs used them solely in this way.	Pamvirs do not track others with their large ears. This is because, after many years, evolution ensured that the Pamvirs used them solely for other things.

Question: The purpose of the Pamvirs' large ears is to track others.