PERCEPTIONS OF PERSONS AND THEIR PURPOSES:

TELEOLOGICAL PATTERNS IN INFERENCES ABOUT PERSONAL IDENTITY

A Dissertation

by

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ABSTRACT

Five studies tested for evidence of teleological (i.e., function- or purpose-based) reasoning in the folk psychology of personal identity. Specifically, these studies tested the hypothesis that teleological processes give rise to previously-documented normativity-based patterns in reasoning about personal identity (specifically the findings that morally-relevant characteristics are seen as more central to identity than morally-irrelevant characteristics, and that people’s true selves are assumed to be morally good by default). Overall, this investigation yielded clear evidence that teleological reasoning is at play in how people think about personal identity, and that teleological and normative judgments are intertwined in this domain. However, the evidence did not clearly show that teleology completely explains normativity-based patterns.

In an initial study, moral character traits were perceived as more identity-relevant than non-moral traits, replicating prior research, and were also judged to be more purpose-relevant. Furthermore, perceptions of purpose-relevance were found to statistically mediate the relationship between traits’ morality and identity-relevance. In a second study, a general-level manipulation of teleological thinking did not significantly affect identity-related judgments in cases of moral change, but some patterns in the data suggested that stronger studies taking a similar approach might have promise. A third study found that suggesting that the pursuit of knowledge is the purpose of human life led participants to see a decline in intelligence (a knowledge-related trait) as somewhat more disruptive to identity persistence, and to see a moral decline as somewhat less disruptive to identity persistence. However, an unanticipated issue with the control condition in this study precludes drawing strong conclusions from these results. In two final studies, whether or not fictional targets continued to fulfill central social-role functions was found to impact judgments about their authenticity and identity persistence across cases of
negative and positive moral and non-moral personal change. In these two final studies, it was also found that teleological considerations (i.e., whether targets continued to fulfill their roles) affected moral evaluations of the targets, and that normative considerations (i.e., whether targets underwent moral vs. non-moral changes) affected the extent to which targets were seen as upholding their purpose in life.
DEDICATION

To Bijou, my cat, my friend, and my teacher.

I could not have done it without you.

Memory eternal!
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INTRODUCTION

In the folk psychology of personal identity, reliance on the notion of a *true self* is widespread. This notion refers to a person’s most essential, individuating attributes; the things that make them who they are “deep down.” The concept of true selves is implicit in the imperatives to be one’s self, to know one’s self, to find one’s self, and so forth that are broadly endorsed in contemporary American society. These imperatives presuppose that there is some enduring core to a person’s identity that may or may not be accurately known and expressed. In addition to being widespread, true-self beliefs also appear to be psychologically consequential, having an impact on well-being (e.g., Schlegel & Hicks, 2011), decision-making (e.g., Schlegel, Hicks, Davis, Hirsch, & Smith, 2013), how people respond to negative information about themselves (Vess, Schlegel, Hicks, and Arndt, 2014), and even consumer preferences (Kim, Seto, Christy, & Hicks, 2016).

Recent investigations by social psychologists and experimental philosophers have revealed an interesting phenomenon in the folk psychology of personal identity. Specifically, people seem to have an intuitive tendency to assume that their own and others’ *true selves* (referring to the essential aspects of an individual’s identity) are morally good. The current project seeks to evaluate a possible explanation for this phenomenon in terms of intuitive cognitive tendencies towards teleological thinking. To situate this project in the broader literature, I review the existing evidence for the moral-true-selves phenomenon and for intuitive teleology prior to outlining the methods of the proposed studies.

**Primary Evidence for a Pervasive Belief in Good True Selves**

A growing body of research shows that people assume that their own and others’ true selves are normatively good, and especially *morally* good. Newman, Bloom, and Knobe (2014)
were the first to explicitly propose that people are biased to conceive of true selves as morally
good. Three studies showed that participants’ own moral values biased their judgments of
whether or not personal changes or beliefs were attributable to targets’ true selves. Participants in
these studies tended to attribute changes or beliefs that they saw as good to targets’ true selves,
but were reluctant to make true-self attributions for things they saw as bad. For example,
politically liberal participants were more inclined to attribute pro-gay beliefs to a target’s true
self, while conservatives were more inclined to attribute anti-gay beliefs to the true self
(Newman et al., 2014, Study 3). These results imply a tendency to view true selves as good,
filtered through the lens of the observer’s own values.

In another series of four studies Newman, De Freitas, and Knobe (2015) replicated the
finding that participants were biased to attribute morally good behaviors to targets’ true selves,
they also found that these true-self attributions explained previously-documented moral
asymmetries in other attributions (e.g., the tendency to selectively attribute happiness to morally
good targets and deny that even subjectively-happy immoral targets are really happy). A belief in
morally good true selves thus seems to inform folk reasoning quite broadly. De Freitas et al.
(2017a) further showed that a belief in moral true selves is even present in unexpected
populations such as misanthropes and residents of interdependent nations. These findings are
testament to the robustness of moral true-self beliefs, suggesting that they are not simply the
idiosyncratic beliefs of optimists or a mere artifact of American culture.

Secondary Evidence for a Pervasive Belief in Good True Selves

While the research program of Newman, Knobe, De Freitas, and their collaborators has
most directly evaluated the phenomenon of good true-self beliefs, a number of other findings
provide additional evidence of its robustness and prevalence. For example, work by Strohminger
and colleagues (Strohminger & Nichols, 2014; 2015; Heiphetz, Strohminger, & Young, 2017) has consistently found that people’s moral character traits are accorded greater importance than other personal characteristics in various judgments about individual identity, including whether a person who has undergone a change is still the same person that they were before. People undergoing moral changes are more likely to be seen as different people after the fact than those undergoing other kinds of changes (e.g., changes in personality, cognitive ability, desires, memories, etc.). Such judgments of identity persistence are among the central outcome measures that will be used in the current studies. While these measures do not require participants to explicitly evaluate targets’ true selves, they clearly tap into folk intuitions about the essential properties of individual identity. If morally good traits are widely believed to constitute a person’s true self, then it makes sense that changes to these traits are particularly disruptive to perceptions of identity persistence.

Several other lines of research have yielded findings that quite directly speak to the idea of morally good true selves. For example, Goodwin, Piazza, and Rozin (2014) found that information about moral character, compared to warmth- or competence-related traits, was explicitly judged to be more fundamental to identity and also had the greatest impact on global evaluations of others. Further indirect evidence for belief in moral true selves is seen in Gino, Kouchacki, and Galinsky’s (2015) finding that inducing participants to feel inauthentic also led them to feel morally impure and to report desires to engage in compensatory prosocial behavior. Inasmuch as inauthenticity consists in being disconnected from one’s true self (Kernis & Goldman, 2006), these findings clearly imply that people see their true selves as morally good.

Some of my own prior work has also found evidence for moral true-self beliefs. Specifically, in two sets of studies, my colleagues and I found that moral information has a
comparatively large impact on how well people report knowing themselves and others. In one series of studies, participants who reflected on past misdeeds reported less self-knowledge than those who recalled neutral or incompetent behaviors (Christy, Seto, Schlegel, Vess, & Hicks, 2016). In-the-moment false feedback telling participants that they had been relatively ungenerous in a hypothetical donation task had a similar effect. These findings imply that people assume their own true selves are also morally good. Reinforcing the idea that people assume others’ true selves are good, participants in the second set of studies reported knowing the most about the true selves of targets who were portrayed as morally good (as opposed to immoral, competent, or incompetent), even when this information was communicated solely via the targets’ facial appearance (Christy, Kim, Schlegel, Vess, & Hicks, 2017).

Finally, findings from Schlegel and colleagues’ broader program of research on true-self beliefs also speak to their value-laden nature, if somewhat less directly. These authors have found that the cognitive accessibility of the true-self concept and subjective feelings of knowing one’s true self are strongly associated with the experience of meaning in life (Schlegel, Hicks, Arndt, & King, 2009; Schlegel, Hicks, King, & Arndt, 2011) and decision satisfaction (Schlegel et al., 2013). These results show that people derive value from their true-self beliefs, consistent with the idea that they believe their true selves to be normatively (if not specifically morally) good. Another series of studies (Bench, Schlegel, Davis, & Vess, 2015) found that people perceive others as having become closer to their true selves when they have changed for the better, a very direct demonstration of how people presume others’ true selves to be good.

This pattern to perceive morally good essences also appears in folk reasoning about the identity of all kinds of individual entities, not just persons. De Freitas, Tobia, Newman, and Knobe (2017b) found that persistence judgments about individual universities, rock bands,
science papers, academic conferences, and nations were all affected by the normative valence of changes undergone by the entity in question. For example, participants were more likely to agree that a university is no longer the same university when it stopped challenging its students and began teaching by rote than when the opposite occurred. De Freitas et al. further found that these effects were mediated by the perception that the essence of the entity in question (whose analog in the case of persons is the true self) is normatively good, according to the relevant norms for the kind of entity in question. These results imply that the phenomenon of morally good true-self beliefs is itself part of a broader pattern in how people reason about individual identity.

These various lines of research all converge to suggest that people have a pervasive tendency to believe in morally good true selves. However, exactly why this is the case remains unclear. Why do people seem to intuitively believe that the good version of a person (or entity) is also the real version? Specifically, I propose that these beliefs arise, at least in part, due to teleological tendencies in folk reasoning about individual identity.

**Teleology: A Brief Conceptual Introduction**

In philosophy, teleology refers to a mode of explanation that appeals to the purposes, aims, or functions of phenomena. Teleology is central to the philosophy of Aristotle. Among the four basic types of causation that he identifies, Aristotle focuses heavily on “final causation” (i.e., teleological causation, causation by purposes; Falcon, 2015). For Aristotle, teleology is a metaphysical reality. The inherent purpose, aim, or function (telos) that things possess is seen as actually causing, in a substantive way, their behavior and development (Shields, 2016. For example, an acorn grows into an oak tree because it aims at becoming a tree; there is a sense in which the acorn is understood to be naturally ordered towards this end state (its distinctive telos).
In Aristotle’s thought, there is a close relationship between an entity’s *telos* and (1) what defines that entity’s essential identity and (2) what is *good* for that kind of entity (Shields, 2016). In the current project, I propose that the intuitive folk understanding of identity is similar to Aristotle’s view. Specifically, I claim that folk reasoning about identity is teleological, resulting in a close relationship between entities’ perceived purposes, judgments concerning their essential identity, and evaluations of what is good for them.

Because people intuitively perceive various kinds of entities in a teleological fashion (i.e., as *existing for purposes*), a normatively good individual (i.e., one which fulfills its purpose) becomes the cognitive exemplar of the kind in question, the paradigm case against which all actual individuals are evaluated. The perceived purposes of various kinds of entities furnish both the definitional descriptions of what the kind essentially *is* (with reference to which identity-related judgments are made), and the normative prescriptions of what it *ought* to be (with reference to which normative evaluations are made). This, I propose, is why people end up believing that their own and others’ true selves are morally good, and why in general there is such a reliable association between normative and identity-related judgments in folk reasoning. In the following, I briefly review the literature on intuitive teleology before further explicating how teleology accounts for moral true-self beliefs.

**Evidence that Teleology is Present in Folk Reasoning**

There is ample theoretical and empirical precedent for the idea that people intuitively engage in teleological reasoning. Kelemen and colleagues have argued and found evidence that explanatory reasoning is characterized by “promiscuous teleology.” In earlier work, Kelemen (1999a, 1999b, 2003, Kelemen & DiYanni, 2005) found that children held teleological understandings of artifacts (e.g., pants), living things (e.g., lions), and natural objects (e.g.,
clouds), seeing entities of all these kinds as “made for something”. Adults, while also endorsing teleological explanations for artifacts and living things, were more selective than children in applying teleological intuitions. Specifically, adults were reluctant to endorse teleological statements about non-living natural objects (e.g., “Clouds are for rain,” Kelemen, 1999a). These early studies were conducted in American and British samples, but recently similar patterns have been observed among Chinese children and adults (Schachner, Zhu, Li, & Kelemen, 2017).

In subsequent work, Kelemen and colleagues have found that adults become more accepting of teleological explanations (e.g., “Water exists so that life can survive on Earth”) when responding under cognitively taxing conditions, such as speeded trials (Kelemen & Rosset, 2009). The same effect emerges among highly educated people, including scholars in the humanities and even natural scientists, who are explicitly trained to understand the world in terms of non-teleological causation (Kelemen, Rottman, & Seston, 2013). Enhanced teleological tendencies are also found among adults with Alzheimer’s disease relative to neurotypical adults (Lombrozo, Kelemen, & Zaitchik, 2007). All of these findings are consistent with the idea that teleological reasoning is an intuitive “default setting” in human cognition, as Kelemen et al. (2013) argue. When cognitive resources are scarce, whether due to temporary situational factors or permanent impairments, people seem to default to teleology.

Recent experimental philosophical work has found direct evidence of teleological tendencies in folk reasoning about the identity of individual objects. In an initial series of studies, Rose (2015) found that judgments of a rock’s identity persistence were more strongly influenced by functional considerations (namely whether or not the rock continued to support the life of a group of worms dwelling within it) than by physical/constitutional considerations. The rock was generally judged to still exist and still be the same rock as long as the worms were able to
continue to subsist in it, even in cases where the rock was pulverized into dust. In a case where
the rock was taken apart piece by piece, and each original was replaced with a new piece,
resulting in two rocks at the end of the process, people tended to judge whichever rock continued
to sustain the worms as being the “same rock.” Similar results were found when the entity in
question was an artifact (a rowboat) or a living organism (a fictional newly-discovered microbe).

In further work, Rose and Schaffer (2017) have replicated and extended these initial
findings to the domain of folk mereology (i.e., judgments of whether distinct parts comprise a
greater whole). These studies found that across a variety of cases, participants’ mereological
judgments were strongly affected by whether or not some purpose was ascribed to the composite
of the parts. For example, in a case where two mice were simply glued together, participants
generally disagreed that the two mice now constituted a new object. However, when a function
was ascribed to the two-mouse union (namely the ability to sniff out bombs), participants tended
to agree that the conjoined mice meaningfully composed a new, higher-order object.

Of especial relevance to the current project, in a recent working paper Rose, Schaffer,
and Tobia (2017) report a series of studies in which teleological and normative effects on
identity judgments were compared. Using the same entities examined by De Freitas et al. (2017b;
namely a university, a band, a physics paper, and an academic conference), Rose et al.
introduced a manipulation of purpose in addition to the manipulation of the normative valence of
change. Once this dimension was introduced to the scenarios, it was found to supersede the
effect of normative valence on judgments of the entities’ identity persistence. For example, in the
band cases, whether or not the band continued making original music at all (i.e., whether it
continued to follow its telos as a band) was the principal determinant of whether people
perceived the band as continuing to exist. Normative effects were still observed in these studies;
if the band kept making music but their music became worse, people were less inclined to judge that its identity persisted than when the band’s music improved. However, the purpose dimension had a much larger impact on identity judgments than normativity. The purpose dimension was also found to affect normative evaluations of the entities; a band that stopped making original music was evaluated on average as a worse band than one that continued.

Rose et al.’s (2017) results are highly consistent with the account being tested in the current project, according to which entities’ perceived purposes inform both conceptions of their essential identities and normative standards of goodness for that sort of entity. In the present project I seek to test how well this teleological account characterizes folk reasoning in the domain of personal identity.

**Rationale for the Current Project**

To summarize, people tend to intuitively perceive things as existing for purposes. Of course, different kinds of entities are perceived to have widely divergent kinds of purposes, but at a general level, people perceive entities as having end states towards which they are aimed or as playing functional roles in some larger system. As a result of this pervasive teleological tendency in human cognition, the way people reason about different kinds of entities and individual instances thereof is organized in large part around the purposes, functions, or aims that entities are perceived to have.

Specifically, a case in which the central functions are fulfilled seems to serve as the paradigm case for the kind of entity in question. Such a case is seen as both descriptively and prescriptively exemplary of the kind, epitomizing both what its members essentially are and what they ought to be. This explains why, across various types of entities, their normatively good properties are perceived to constitute their true nature. Perceived purposes inform intuitive
understandings of both what it means to be a given kind of thing and what it means to be a good thing of that kind. This results in a close cognitive correspondence between (1) perceived purposes, (2) individual- and kind-level identity judgments, and (3) normative evaluations.

In order for this teleological account to be extended to personal identity and the phenomenon moral true-self beliefs, it is necessary to speculate to some extent about what the perceived purpose of persons might be. The teleological account states that people perceive all kinds of entities as having functions that they aim to fulfill, and that functional fulfillment defines what is normatively good for given kinds of entities. As such, on this account the folk view can be characterized as the view that entities aim at being good instances of their kind. It then follows that with respect to persons, their perceived purpose is to be good persons.

This characterization of the folk view seems sufficient to account for the centering of morality in reasoning about personal identity (Goodwin et al., 2014; Strohminger & Nichols, 2014; 2015; Heiphetz et al., 2017; Christy et al., 2016; 2017) and the belief in morally good true selves (Newman et al., 2015; De Freitas et al., 2017a; 2017b), and sufficiently flexible to allow for the kind of individual ideological differences observed by Newman et al. (2014). To the extent that people largely agree that character traits such as kindness and compassion are part of what constitutes good personhood, it makes sense on the teleological account that traits like these carry additional weight in reasoning about personal identity. Indeed, Heiphetz et al. (2017) found that changes to a person’s agreed-upon moral beliefs (e.g., that murder is wrong) were perceived as more disruptive to individual identity than changes in more controversial moral beliefs (e.g., that abortion is wrong). For these controversial beliefs and other traits whose moral valence is less agreed-upon, the teleological view predicts the kind of patterns observed by Newman et al. (2014), namely moderation by perceivers’ own views of what is moral.
While characterizing the folk view in this way seems to account nicely for much of the observed evidence, in the present project I seek to subject this teleological explanation for the centering of morality in reasoning about personal identity to a series of direct tests.

**Overview of the Present Studies**

The overarching claim at issue in this project is that intuitive teleological tendencies in reasoning about identity explain the prevalent belief in good true selves. Several central predictions derived from this overarching claim will be put to the test in the present studies. First, if teleology explains why true selves are seen as good, then moral goodness should be perceived as an aim or end towards which people are naturally oriented (i.e., the human telos), and these perceptions of purposiveness should mediate the relationship between traits’ morality and judgments of their true-self relatedness and centrality to individual identity. In other words, morally good actions and character traits should be attributed to the true self and seen as central to identity only to the extent that they are perceived as fulfillments of humans’ distinctive aims. These predictions will be tested in Study 1.

It also follows from a teleological account that if teleological reasoning is somehow undermined, then this should attenuate the relationship between morality and identity. That is, if general-level intuitive tendencies towards teleological reasoning are a driving force behind the centering of morality in reasoning about personal identity, then an experimental manipulation of these general-level teleological tendencies should have an impact on identity-related judgments in cases of moral change. This hypothesis will be tested in Study 2.

In addition to this prediction about general-level teleological intuitions, the teleological account also implies that *whatever specific qualities people regard as central purposes of human life* should carry additional weight in reasoning about identity. The existing literature implies that
people may commonly perceive the human purpose or *telos* as being moral. However, if people are experimentally induced to perceive other ends as central aims of human life, then personal characteristics that pertain to those ends should take on additional importance in identity-related judgments and should be evaluated as normatively better traits for a person to have. For example, if people are led to believe that the attainment of knowledge is a human *telos*, then knowledge-relevant traits (e.g., intelligence, curiosity) should come to be seen as more central and essential features of individual identity, and as more important to what it means to be a good person. This hypothesis will be tested in Study 3.

Further, if teleology explains why true selves are seen as good, then the impact of moral deterioration on identity-related judgments should be mitigated when these changes do not disrupt a person’s purposive activities. In other words, a person who undergoes a moral change for the worse should still be perceived as essentially the same person (identity persistence) and as relatively authentic/true to themselves, provided they are still able to fulfill their central purposes post-change. Additionally, it follows from a teleological account that non-moral changes will become *more* disruptive to identity-related judgments when those changes disrupt purposive activity. A person who undergoes a non-moral change (e.g., becoming more anxious), after which they are no longer able to fulfill their central purposes, should be perceived as less of the same person than one who underwent the same change that was not purpose-disruptive. These predictions will be tested in Study 4A.

Prior work suggests that changes for the better are typically perceived as resulting in the individual in question moving *closer* to their true self (i.e. becoming more authentic; Newman et al., 2014; Bench et al., 2015). However, a teleological account predicts that even positive changes should be disruptive to perceptions of authenticity and identity continuity when those
changes are disruptive to purposive functioning. A person who improves morally, but as a result ceases to perform their central functions, should be perceived as less of the same person than a moral improver whose purposive functioning is unaffected. This prediction will be tested in Study 4B.

**Pre-Registration**

For each study, the primary hypotheses and statistical tests thereof were pre-registered using AsPredicted.org. Links to each study’s pre-registration are provided in the corresponding methods sections. The pre-registrations also included data exclusion criteria for all studies other than Study 1. The exclusion criteria included performance on embedded attention-check items (Studies 2 and 3), responses to factual comprehension-check items (Study 3), and responses to a seriousness-check item (Studies 4A and 4B). In each of the following methods and results sections, the number of participants excluded according to pre-registered criteria is noted, as are any deviations from the pre-registered statistical analysis plans.
STUDY 1: METHODS

Study 1 tested the hypotheses that being moral is perceived as a central purpose of human existence, and that the perceived purposiveness of moral qualities explains why they carry more weight than non-moral qualities in identity-related judgments. Two senses of *purposiveness* and several distinct identity-related judgments were explored in this study, as there are distinct ways of understanding the concept of *purpose* as applied to human beings and their traits. On the one hand, certain traits may be perceived as traits that people explicitly, even intentionally, *aim at having*. Alternatively, certain traits might be perceived as comprising an end state (i.e., a state of maturity or full development) towards which people are naturally oriented. Items tapping both of these conceptions of human purposiveness were included in Study 1.

With respect to identity-related judgments, the research reviewed previously has focused on a few variables that are closely related but conceptually distinguishable. *Identity centrality* refers to a direct judgment of how central or important a given trait is in defining the identity of an individual who possesses it (e.g., Goodwin et al., 2014; see also Haslam, Bastian, & Bissett, 2004). *Identity persistence* refers to judgments about the degree to which an individual remains the same person vs. becomes a different person over time and across changes to their traits (e.g., Strohminger & Nichols, 2014; Rose, 2015; De Freitas et al., 2017b). Finally, *true-self relevance* refers to explicit judgments of whether or not a given trait constitutes part of a person’s true self. These judgments should be closely related empirically. Inasmuch as the true self is conceived of as the metaphorical “core” of identity (Landau et al. 2011), perceptions of traits’ identity centrality and true-self relevance should covary closely. Further, traits that are judged to be highly central and true-self relevant should also be seen as important determinants of identity persistence. While close associations between these judgments are anticipated, items tapping all
three of these identity-related judgments were included to integrate the present investigation with as much of the prior literature as possible.

Four specific hypotheses were tested in Study 1. First, replicating past research, moral character traits should be perceived as more identity-related than other types of personal characteristics. Second, moral character traits should be perceived as more purposive than other types of personal characteristics; this is a central prediction of the teleological view. Third, perceptions of purposiveness should mediate the relationship between characteristics’ perceived morality and their identity-relatedness. Finally, individual differences in teleological thinking (or more general intuitive cognitive tendencies) should moderate these effects, such that they will be more pronounced among individuals with stronger intuitive teleological tendencies.

Participants

Participants in Study 1 were 278 undergraduate students (218 women, 57 men, 1 other gender identity, 2 not reporting gender) recruited from the psychology department subject pool at Texas A&M University, who received credit towards course requirements in exchange for participation. Ages in the sample ranged from 18 to 22 ($M_{\text{age}} = 18.50, SD = .80$), and the primary racial/ethnic groups represented were White (67%) and Hispanic/Latinx (23%).

A target sample size of 300 was initially set in order to exceed 80% power to detect small effects in a repeated-measures multivariate ANOVA with a four-level within-subjects factor (target $N$ for 80% power = 277; computed using G*Power, Faul, Erdfelder, Buchner, & Lang, 2007). The study was run in one-week increments, and after 2 weeks, 278 participants had completed the study. Although this did not reach the target of 300, because this sample size met
the minimum for 80% power\(^1\), the decision was made to terminate the study rather than continue data collection for an additional week. The full pre-registration for Study 1 can be found online at http://aspredicted.org/blind.php?x=ds7ip5.

**Materials and Procedure**

Study 1 made use of procedures adapted in large part from Goodwin et al. (2014). Participants rated a number of personal characteristics on the dimensions of *purposiveness*, *moral/normative relevance*, and *identity centrality*.

**Personal Characteristics.** Each participant evaluated a set of 32 personal traits\(^2\) used by Goodwin et al. (2014; see Appendix A for the full list of traits). The traits represented four different conceptual categories, namely *high morality, high warmth* (e.g., kind); *high morality, lower warmth* (e.g., courageous); *high warmth, lower morality* (e.g., sociable); and *ability-related* (e.g., athletic)\(^3\). Each trait was presented on a single screen of the study, accompanied by several rating scales pertaining to that characteristic. For the sake of interpretive simplicity, all of the characteristics were positively-valenced.

**Rating Dimensions.** Each of the 32 personal characteristics was rated on several dimensions (see Appendix B for an example of the presentation). Ratings were recorded on 101-point slider scales (0 = not at all, 100 = completely). Traits’ moral/normative relevance was

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\(^{1}\) It should be noted that power analyses for within-subjects designs are controversial (e.g., Albers & Lakens, 2017), and these calculations may not be the best possible estimates of the necessary sample size to achieve adequate power. However, they represent a good-faith effort to ensure that this study was adequately powered by at least some estimate.

\(^{2}\) Initially, the full set of 32 traits was presented to each participant. However, this proved to take most participants longer to complete than the 30 minutes that had been allotted for the study. Thus, the design was modified so that each participant was presented with a subset of 16 out of the 32 traits (4 from each conceptual category). Fifty participants completed ratings for all 32 traits, and the remaining 228 completed the study with the modified design.

\(^{3}\) There is extensive evidence that people distinguish broadly between traits pertaining to warmth and competence (for a review see Fiske, Cuddy, & Glick, 2007). While some person perception scholars (e.g., Wojciszke, 2005) identify morality with the warmth dimension, Goodwin et al. (2014) find that moral character can be meaningfully distinguished from both warmth and competence.
assessed with two items (similar items were used to assess traits’ relevance to *goodness/badness* and *morality/immorality* by Goodwin et al., 2014):

1. **How useful would having information about this trait be in telling you how good or bad a person is?**
2. **How useful would having information about this trait be in telling you how moral or immoral a person is?**

Scores on these items were averaged to yield a composite moral/normative relevance variable (*M* = 44.09, *SD* = 33.32, Cronbach’s *α* = .92).

Acknowledging that there are multiple senses in which the concept of *purpose* can be applied to human beings, several items (originally composed for this project) targeted the purposiveness dimension:

1. **A central aim of human life is to develop or acquire this characteristic.**
2. **Having this characteristic is part of what it means to be a fully-functioning person.**
3. **Part of the purpose of human life is for people to express this characteristic.**
4. **A person who lacks this characteristic will not be able to reach their full human potential.**
5. **Having this characteristic is part of what it means to be a mature person.**

An exploratory factor analysis was conducted on the scores for these items to determine whether they covaried closely enough to be averaged into a single composite purposiveness variable. Following the recommendations of Matsunaga (2010), I used principal-axis factoring with a promax rotation. The EFA results indicated that a single-factor solution was appropriate; the first factor was the only factor extracted with an eigenvalue greater than 1 (eigenvalue = 3.57) and this factor explained 71.39% of the variance in the item scores. Given that these items were written to tap into two different senses of *purposiveness*, it was anticipated that a two-factor solution might have been obtained, but this was not the case. All items exhibited loadings exceeding |.40| on the first extracted factor, and as such the five items were averaged together
into a single composite variable indexing perceived purposiveness \((M = 50.95, SD = 26.86, \text{ Cronbach’s } \alpha = .90)\).

Finally, three items assessed the identity-relatedness of each characteristic, specifically targeting judgments of identity centrality, identity persistence, and true-self relevance:

1. *This characteristic is a central aspect of a person’s identity; if you have it, it defines who you are.* (Identity centrality; wording adapted from Haslam et al., 2004 where the item used “personality” instead of “identity”)
2. *If a person who had this characteristic were to suddenly lose it, while remaining the same in all other respects, to what extent would they be a different person than they were before?* (Identity persistence; original item written for this project)
3. *For people who have this characteristic, it makes up a part of their true self.* (True-self relevance; original item written for this project)

As with the purposiveness items, an EFA was conducted to determine whether the three items were sufficiently correlated to be averaged into a composite index of identity-relatedness. Results of this EFA also supported a single-factor solution; the first factor extracted was again the only one to display an eigenvalue greater than 1 (eigenvalue = 2.12) and this factor accounted for 70.64% of the variance in item scores. All three items displayed loadings in excess of |.40| on this factor, and were thus averaged together into a single composite identity-relatedness variable \((M = 66.84, SD = 22.29, \text{ Cronbach’s } \alpha = .79)\).

*Exploratory Individual Difference Measures*. After rating the personal characteristics, participants completed several individual difference measures prior to completing demographic items and being debriefed. The order of these measures was randomized. A fifteen-item measure of teleological tendencies, composed of selected statements from Kelemen et al. (2013; e.g., “Rain falls in order to allow plants to grow,” \(1 = \text{Strongly disagree}, 7 = \text{Strongly agree}\)), assessed participants’ tendency to understand phenomena in terms of functions or purposes \((M = 4.93, SD = 1.30, \text{ Cronbach’s } \alpha = .93)\). The Inherence Heuristic Scale (IHS; Salomon & Cimpian, 2014)
assessed tendencies to explain prevailing patterns in terms of objects’ intrinsic properties (e.g., “It seems natural that engagement rings typically have diamonds,” 1 = *Strongly disagree*, 9 = *Strongly agree*; *M* = 6.14, *SD* = 1.13, Cronbach’s α = .83). Finally, the short form of the Rational-Experiential Inventory (REI; Epstein, Pacini, Denes-Raj, & Heier, 1996) assessed participants’ preferences for engaging in analytic (e.g., “I prefer complex to simple problems;” *M* = 3.42, *SD* = .73, Cronbach’s α = .70) and intuitive modes of thought (e.g., “I believe in trusting my hunches,” 1 = *Completely false*, 5 = *Completely true*; *M* = 3.81, *SD* = .63, Cronbach’s α = .68).
**STUDY 1: RESULTS**

**Manipulation Check**

To test whether the four categories of personal traits indeed differed in their perceived morality, a repeated-measures ANOVA was conducted with trait type entered as a within-subjects factor and average morality ratings entered as the dependent variable. Results of this analysis\(^4\) indicated a significant effect of trait type, \(F(2.31, 631.57) = 1095.87, p < .001\). Bonferroni-adjusted post-hoc comparisons revealed that the two high-morality trait categories were perceived as more morally-relevant than the other two categories, as intended. Means, test statistics, and effect sizes for these comparisons are reported in Table 1.

**Table 1.** Perceived Morality according to Trait Type, Study 1.

<table>
<thead>
<tr>
<th>Means and Confidence Intervals by Trait Type</th>
<th></th>
<th></th>
<th>Ability-Related</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Morality, High Warmth</strong></td>
<td>65.10</td>
<td>67.34</td>
<td>27.11</td>
</tr>
<tr>
<td><strong>High Morality, Low Warmth</strong></td>
<td>[62.99, 67.20]</td>
<td>[65.20, 69.49]</td>
<td>[25.20, 29.20]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Traits Compared</th>
<th>(M_{\text{diff}}) [95% CI]</th>
<th>(p_{\text{Bonf}})</th>
<th>(d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Morality, High Warmth vs.</td>
<td>-2.25</td>
<td>.086</td>
<td>.13</td>
</tr>
<tr>
<td>High Morality, Low Warmth</td>
<td>[4.67, .18]</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Morality, High Warmth vs.</td>
<td>37.99</td>
<td>&lt; .001</td>
<td>2.11</td>
</tr>
<tr>
<td>High Morality, Low Warmth</td>
<td>[35.15, 40.82]</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Morality, High Warmth vs.</td>
<td>48.15</td>
<td>&lt; .001</td>
<td>2.92</td>
</tr>
<tr>
<td>Ability-Related</td>
<td>[44.83, 51.48]</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Morality, Low Warmth vs.</td>
<td>40.23</td>
<td>&lt; .001</td>
<td>2.21</td>
</tr>
<tr>
<td>High Warmth, Low Morality</td>
<td>[37.09, 43.38]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Morality, Low Warmth vs.</td>
<td>50.40</td>
<td>&lt; .001</td>
<td>3.02</td>
</tr>
<tr>
<td>Ability-Related</td>
<td>[46.97, 53.84]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Warmth, Low Morality vs.</td>
<td>10.17</td>
<td>&lt; .001</td>
<td>.62</td>
</tr>
<tr>
<td>Ability-Related</td>
<td>[7.91, 12.43]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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\(^4\) Mauchly’s test of sphericity was significant for this ANOVA, \(W = .65, \chi^2 = 115.84, p < .001\), and accordingly these results are reported with a Greenhouse-Geisser adjustment of \(\varepsilon = .77\) applied to the degrees of freedom.
Primary Analyses

Two primary types of analyses were conducted to test Study 1’s hypotheses. First, a repeated-measures multivariate ANOVA examined whether high-morality character traits are perceived as more identity-related and more purposive than other types of personal characteristics. In this analysis, characteristic type was entered as a within-subjects factor, and ratings of identity-relatedness and purposiveness were entered as the dependent variables. A multivariate effect of characteristic type was observed, $F(6, 1650) = 139.48, p < .001, \eta^2_p = .34$, indicating an overall effect when collapsing across the dependent measures. Univariate omnibus effects$^5$ were observed for both identity-relatedness, $F(2.51, 690.88) = 108.80, p < .001, \eta^2_p = .28$, and purposiveness, $F(2.55, 701.02) = 378.33, p < .001, \eta^2_p = .58$, indicating that both types of judgments varied depending on the type of characteristic in question.

Bonferroni-adjusted post-hoc tests compared the perceived identity-relatedness and purposiveness of each specific type of characteristic. The critical hypothesis derived from the teleological account was that moral character traits (both those high and low in warmth) should be rated as being more identity-related and purposive than either non-moral warm traits or ability-related traits. This predicted pattern was observed in the results; both categories of high-morality traits were rated as more identity-related and more purposive than either category of low-morality traits. Tables 2 and 3 present detailed results for identity-relatedness and purposiveness, respectively.

$^5$ Mauchly’s test of sphericity was significant for both identity relevance (Mauchly’s $W = .75, \chi^2 = 79.05, p < .001$) and purposiveness (Mauchly’s $W = .75, \chi^2 = 79.62, p < .001$), and accordingly results for each dependent measure are reported with a Greenhouse-Geissser adjustment applied to the degrees of freedom at $\epsilon = .84$ for identity relevance and $\epsilon = .85$ for purposiveness.
### Table 2. Perceived Identity-Relatedness according to Trait Type, Study 1.

<table>
<thead>
<tr>
<th>High Morality, High Warmth</th>
<th>High Morality, Low Warmth</th>
<th>High Warmth, Low Morality</th>
<th>Ability-Related</th>
</tr>
</thead>
<tbody>
<tr>
<td>70.49</td>
<td>71.79</td>
<td>65.36</td>
<td>58.15</td>
</tr>
<tr>
<td>[68.74, 72.24]</td>
<td>[70.01, 73.58]</td>
<td>[63.47, 67.24]</td>
<td>[56.06, 60.23]</td>
</tr>
</tbody>
</table>

#### Pairwise Comparisons

<table>
<thead>
<tr>
<th>Traits Compared</th>
<th>M diff</th>
<th>[95% CI]</th>
<th>p Bonf</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Morality, High Warmth vs. High Morality, Low Warmth</td>
<td>-1.30</td>
<td>[-2.97, .36]</td>
<td>.233</td>
<td>.09</td>
</tr>
<tr>
<td>High Morality, High Warmth vs. High Warmth, Low Morality</td>
<td>5.14</td>
<td>[2.99, 7.28]</td>
<td>&lt; .001</td>
<td>.33</td>
</tr>
<tr>
<td>High Morality, High Warmth vs. Ability-Related</td>
<td>12.35</td>
<td>[9.76, 14.93]</td>
<td>&lt; .001</td>
<td>.76</td>
</tr>
<tr>
<td>High Morality, Low Warmth vs. High Warmth, Low Morality</td>
<td>6.44</td>
<td>[4.39, 8.49]</td>
<td>&lt; .001</td>
<td>.42</td>
</tr>
<tr>
<td>High Morality, Low Warmth vs. Ability-Related</td>
<td>13.65</td>
<td>[11.09, 16.21]</td>
<td>&lt; .001</td>
<td>.83</td>
</tr>
<tr>
<td>High Warmth, Low Morality vs. Ability-Related</td>
<td>7.21</td>
<td>[4.96, 9.46]</td>
<td>&lt; .001</td>
<td>.43</td>
</tr>
</tbody>
</table>

### Table 3. Perceived Purposiveness according to Trait Type, Study 1.

<table>
<thead>
<tr>
<th>High Morality, High Warmth</th>
<th>High Morality, Low Warmth</th>
<th>High Warmth, Low Morality</th>
<th>Ability-Related</th>
</tr>
</thead>
<tbody>
<tr>
<td>61.67</td>
<td>63.55</td>
<td>40.14</td>
<td>39.89</td>
</tr>
<tr>
<td>[59.56, 63.79]</td>
<td>[61.47, 65.63]</td>
<td>[38.10, 42.19]</td>
<td>[37.82, 41.96]</td>
</tr>
</tbody>
</table>

#### Pairwise Comparisons

<table>
<thead>
<tr>
<th>Traits Compared</th>
<th>M diff</th>
<th>[95% CI]</th>
<th>p Bonf</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Morality, High Warmth vs. High Morality, Low Warmth</td>
<td>-1.87</td>
<td>[-3.69, -.06]</td>
<td>.039</td>
<td>.11</td>
</tr>
<tr>
<td>High Morality, High Warmth vs. High Warmth, Low Morality</td>
<td>21.53</td>
<td>[18.94, 24.12]</td>
<td>&lt; .001</td>
<td>1.23</td>
</tr>
<tr>
<td>High Morality, High Warmth vs. Ability-Related</td>
<td>21.79</td>
<td>[19.92, 24.65]</td>
<td>&lt; .001</td>
<td>1.23</td>
</tr>
<tr>
<td>High Morality, Low Warmth vs. High Warmth, Low Morality</td>
<td>23.40</td>
<td>[20.88, 25.93]</td>
<td>&lt; .001</td>
<td>1.34</td>
</tr>
<tr>
<td>High Morality, Low Warmth vs. Ability-Related</td>
<td>23.66</td>
<td>[20.94, 26.37]</td>
<td>&lt; .001</td>
<td>1.35</td>
</tr>
<tr>
<td>High Warmth, Low Morality vs. Ability-Related</td>
<td>.255</td>
<td>[-2.25, 2.76]</td>
<td>1.00</td>
<td>.01</td>
</tr>
</tbody>
</table>
The second primary type of analysis in Study 1 were mediation analyses testing the hypothesis that perceptions of purposiveness mediate the relationship between morality and identity centrality (see Figure 1 for the conceptual model). Because the data in Study 1 have a hierarchical structure, with characteristics nested within persons, these analyses were conducted using hierarchical linear modeling (HLM; Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011). Two different mediation models, each with a different operationalization of the morality variable, were estimated following the guidelines for conducting mediation in HLM described by Bauer, Preacher, & Gil (2006), making use of the instructions and Excel calculators developed by Mathiowitz and Bauer (2008). In both models, the mediating variable (M) was the perceived purposiveness of each characteristic, and the outcome variable (Y) was the characteristics’ identity centrality. See Figure 1 for the conceptual model.

**Figure 1.** Conceptual mediation model, Study 1.

\[
\begin{align*}
\text{Morality (Categorical or Continuous)} & \rightarrow \text{Purposiveness} \\
\text{Purposiveness} & \rightarrow \text{Identity-Relatedness} \\
\text{C (c')} & = a + b
\end{align*}
\]

*Note: Positive signs indicate the predicted and observed direction of the relationships.*

In one model, a dummy-coded categorical morality variable was computed (0 = not moral, 1 = moral) based on the characteristics’ membership in the *a priori* conceptual categories, and this variable was used as the independent variable (X) in the mediation model. This model tested whether the set of moral character traits, compared to the non-moral characteristics, were perceived as more central to individual identity to the extent that it was perceived as more
purposive. In this model, the total effect path ($c$) was significant, $b = 9.52$, $SE = .073$, $95\% \ CI = [8.09, 10.95]$, reflecting the fact that the set of moral traits was judged to be more identity-related overall than the set of non-moral traits. The direct-effect path between morality and purposiveness ($a$) was also significant, $b = 24.15$, $SE = .80$, $95\% \ CI = [22.58, 25.70]$, as was the direct-effect path ($b$) between purposiveness and identity-relatedness, $b = .36$, $SE = .02$, $95\% \ CI = [.32, .39]$. Critically, the results of this model also indicated a significant indirect effect of traits’ morality on their identity-relatedness, mediated by their perceived purposiveness, $b = 8.69$, $SE = .55$, $95\% \ CI = [7.60, 9.78]$. After accounting for this indirect effect, the direct-effect path ($c'$) between morality and purposiveness was no longer significant, $b = .83$, $SE = .61$, $95\% \ CI = [-.37, 2.04]$, indicating that the relationship between traits’ morality and perceptions of identity-relatedness was fully mediated by their perceived purposiveness. A separate mediation model, in which participants’ perceptions of traits’ morality were used as the independent variable, yielded very similar results.

**Exploratory Analyses**

To test the exploratory hypothesis that the predicted patterns would be especially pronounced among individuals high in teleology and related intuitive tendencies, four repeated-measures MANOVAs were performed. These analyses were identical to the primary MANOVA reported previously, with the addition of one of the four individual-difference variables (teleology, inherence heuristic, preferences for rational and experiential processing) as an interaction term. A significant interaction between trait type and the individual-difference variable in question in each model would indicate that responses to the four different trait types vary as a function of individuals’ intuitive cognitive tendencies. Overall, the results of these analyses indicated that the effects of trait type on perceptions of purposiveness and identity-
relatedness were largely unmoderated by individual differences (all multivariate \( ps \geq .093 \)).

Across the four models, none of the univariate interaction effects for either dependent measure were found to be statistically significant (all \( ps \geq .091 \)).
STUDY 1: BRIEF DISCUSSION

Overall, the results of Study 1 were highly consistent with the predictions derived from the teleological account. Compared to non-moral characteristics, moral personal traits (whether high or low in warmth) were perceived as both more purposive and more identity-related. Furthermore, the mediation analyses indicated that the relationship between traits’ morality and identity-relatedness may be at least partially explainable in terms of perceived purposiveness. Given the cross-sectional nature of the data, the mediation results are only illustrative, and do not show that the variables are actually causally related to one another in the manner specified in the models. Thus, Study 1 provides overall evidence that perceptions of morality, purposiveness, and identity-relatedness are closely intertwined at the level of traits, consistent with the proposed teleological account. However, this evidence falls short of demonstrating that perceptions of purpose play a causal role in producing identity-related judgments, which is the most central claim of the teleological account.
STUDY 2: METHODS

The primary hypothesis tested in Study 2 was that undermining general-level teleological intuitions would reduce the relative importance of moral character in identity-related judgments. If the centering of morality in reasoning about personal identity is due to the operation of teleological tendencies, then this phenomenon should be attenuated if teleological reasoning can be held in check.

Participants

Participants for Study 2 were 538 undergraduate students (369 women, 165 men, 1 gender-nonconforming, 1 unsure of gender identity, 2 not reporting gender) recruited from the psychology department subject pool at Texas A&M, who received course credit in exchange for their participation. Ages in the sample ranged from 18 to 40 ($M = 18.94$, $SD = 1.40$), and most participants were either White (69%) or Hispanic/Latinx (29%).

Sample size was pre-determined based on power analysis to exceed 80% power to detect small-to-medium effects in a one-way MANOVA with a two-level between-subjects factor and two outcome variables (target $N$ for 80% power = 326; computed using G*Power, Faul et al., 2007). Originally, a sample size of 400 was sought to reach the calculated target $N$ after anticipated exclusions of inattentive participants. However, due to some unexpected problems with the manipulation resulting in 216 participants being excluded from primary analyses (see footnote 4 below), data collection was continued in an effort to achieve the target $N$ among participants for whom the manipulation worked as intended. Ultimately, a sample of 322 participants completed the study with the manipulation functioning correctly. However, 31 additional participants were excluded from analyses for failing two or more embedded attention-check items (a pre-registered exclusion criterion; see the full pre-registration at
http://aspredicted.org/blind.php?x=8n7qi7), resulting in a final $N$ of 291 included in analyses. Thus, the final sample of analyzed cases fell short of the target sample size, and this study was likely underpowered.

**Materials and Procedure**

The experimental procedure in Study 2 relied on a battery of teleological statements developed by Kelemen et al. (2013; see Appendix C for the full list). These statements were used to manipulate general-level teleological tendencies. Participants were randomly assigned to either an anti-teleology or pro-teleology condition, prior to completing the dependent measures, which consisted of several identity-related judgments about persons undergoing negative changes in their moral character (adapted from Strohminger & Nichols, 2014). While the statements from Kelemen et al. (2013) pertain to natural phenomena (i.e., physical, chemical, or biological processes and systems), and not directly to teleology about humans, the rationale behind this manipulation was that inducing participants to question teleological intuitions in one domain may have “spillover” effects on reasoning about individual identity if teleological processes are also operative in that domain.

*Manipulation of Intuitive Teleology*. All participants were presented with a selection of 10 of the teleological statements used by Kelemen et al. (2013; e.g., “Trees produce oxygen so that animals can breathe”). In both the pro- and anti-teleology conditions, participants first indicated their agreement with the statements in a forced-choice true/false response format. Then, the next screen of the study displayed the statements to which the participant had
responded affirmatively. Participants were then instructed to select three of these statements\(^6\) and to briefly argue that each selected statement is false (in the anti-teleology condition) or true (in the pro-teleology condition). As a manipulation check, all participants subsequently indicated their degree of agreement with a battery of 10 additional teleological statements from Kelemen et al. (2013); responses to these statements were averaged together to form a composite manipulation-check variable (\(M = 4.60, SD = 1.28, \text{ Cronbach’s } \alpha = .91\)).

An initial version of this manipulation, which also included a neutral condition in which participants simply indicated their endorsement of the teleological statements before completing the dependent measures, was piloted in a sample of 137 Texas A&M undergraduates. As non-endorsement was anticipated to be a potential problem, the rates at which participants endorsed the initial set of statements were examined. Only 6 participants in the pilot sample indicated that all 10 of the teleological statements were false, suggesting that non-endorsement would not be a serious problem in the study proper. However, as non-selection of endorsed statements (see footnote 6 above) was not anticipated as a problem, this issue was not examined in the pilot data. A high rate of non-selection occurred in both the pro-teleology (21 non-selectors out of 46) and anti-teleology (19 non-selectors out of 46) conditions, but this was overlooked at the time of pilot testing. The pilot results showed that only the pro- and anti-teleology conditions differed from one another on the manipulation-check measure (\(M_{PT} = 4.60, M_{AT} = 3.99, p = .018, d = .51\)); the

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\(^6\) Some participants (\(n = 32\)) responded that all 10 of the teleological statements were false. Thus, they were unable to subsequently select statements to argue for vs. against, and consequently the manipulation did not function as intended for these participants. In addition to these non-endorsers, a large number of participants (\(n = 184\)) did not select statements to argue for vs. against from among the statements they had initially endorsed. This unexpected problem likely resulted from the question format, which displayed a list of the initially-endorsed items to each participant but did not register a response unless participants dragged and dropped at least one item to a new position in the list. Presumably, many of these participants simply missed the instructions stating they needed to do this before their selections would register. Both groups of participants (non-endorsers and non-selectors) simply saw an example pro- or counter-argument for a teleological statement on the following screen of the study, and did not generate any arguments themselves.
control condition exhibited a middling mean value \((M = 4.35)\) that did not significantly differ from either condition \((p < .163)\). Based on these results, only the pro- and anti-teleology conditions were retained in the main study.

**Dependent Measures: Identity-Related Judgments.** After exposure to the manipulation, participants read eight brief vignettes describing target persons who undergo negative changes in their moral character (e.g., become more hostile to others, less helpful and honest; see Appendix D for full vignette text). After reading each vignette, participants made various identity-related judgments about the target. Two items accompanying each vignette, used previously by De Freitas et al. (2017a), assessed judgments of *identity persistence*:

1. **After these changes, [Target Name] is not really the same person as [Target Name] before the changes took place.** (7-point response scale, 1 = Strongly disagree, 7 = Strongly agree)

2. **Person A thinks that [Target Name] after the changes is still the same person as [Target Name] before the changes. Person B thinks that [Target Name] after the changes is no longer the same person they used to be. The way Person B sees it, the original [Target Name] no longer exists. Do you agree more with Person A or Person B?** (7-point response scale, 1 = Person A, 4 = Equally agree with both persons, 7 = Person B)

Responses to these two items were reverse-coded, then averaged across the eight vignettes to obtain a composite measure of identity persistence \((M = 3.54, SD = 1.15, \text{Cronbach’s } \alpha = .94)\). In addition, three items asked participants to evaluate where each target stood in relation to their *true self* and how authentic each target was after the described change:

1. **After undergoing this change, to what extent is [Target Name] being true to the deepest, most essential aspects of their being?** (7-point response scale, 1 = Not at all, 7 = A great deal; wording adapted from De Freitas et al., 2017a)

2. **Which of these pictures best represents the relationship between [Target Name] after undergoing this change and [Target Name]’s true self?** (7-point Venn diagram response scale with each scale point reflecting greater overlap between target and target’s true self; adapted from the Inclusion of Other in the Self scale, Aron, Aron, & Smollan, 1992)

3. **After undergoing this change, how authentic would you say that [Target Name] is overall?** (7-point response scale, 1 = Not authentic at all, 7 = Completely authentic; original item)
Scores on these items were averaged together across vignettes to yield a composite index of true-self judgments, on which higher scores indicate greater authenticity/a closer relationship between the target and their true self ($M = 3.18$, $SD = 1.05$, Cronbach’s $\alpha = .93$). These two identity-related composite variables (identity persistence and authenticity judgments) were the primary dependent measures in Study 2. These variables displayed a robust positive correlation with one another ($r = .30$), but were not so highly correlated as to suggest that they are identical.
STUDY 2: RESULTS

Manipulation Check

To gauge the effectiveness of the teleology manipulation, an independent-samples $t$-test was calculated comparing average endorsement of the second set of 10 teleological statements between the pro- and anti-teleology conditions. Results of this analysis indicated a significant effect of condition, $t(289) = 2.59$, $p = .010$, $d = .30$, such that endorsement of the teleological statements was higher in the pro-teleology condition ($M = 4.50$, $SD = 1.21$) than the anti-teleology condition ($M = 4.15$, $SD = 1.08$). The manipulation thus appears to have been successful, at least among participants who completed the procedure as intended.

Figure 2. Identity-Related Judgments by Condition, Study 2.

Primary Analysis

To test the primary hypothesis of Study 2, a multivariate ANOVA was conducted with the two identity-related variables entered as outcomes, and condition entered as a between-subjects factor. This analysis tested whether participants responded to cases of moral decline
differently in the anti-teleology condition compared to the pro-teleology condition. The multivariate results indicated that the effect of condition was nonsignificant overall, $F(2, 288) = .81, p = .445$, $\eta^2_p = .01$. The univariate tests indicated that the effect of condition were nonsignificant both for targets’ perceived authenticity, $F(1, 289) = 1.51, p = .221$, $\eta^2_p = .01, d = .14$, and for targets’ perceived identity persistence, $F(1, 289) = .002, p = .968$, $\eta^2_p = .000, d = .005$. Thus, none of the predicted differences were observed between the pro-teleology ($M_{Auth} = 3.05, SD_{Auth} = 1.02, M_{IDpersist} = 3.48, SD_{IDpersist} = 1.03$) and anti-teleology conditions ($M_{Auth} = 3.19, SD_{Auth} = .93, M_{IDpersist} = 3.49, SD_{IDpersist} = 1.09$). Results of this analysis are presented in the left portion of Figure 2.

**Exploratory Analyses**

To further explore potential effects of condition, a mixed MANOVA was run in which target was added as a within-subjects factor in addition to the between-subjects condition factor. This pre-registered analysis thus examined whether any of the individual targets may have displayed the predicted effects, even though they were not seen in aggregate. Results of this analysis indicated that, while none of the simple effects of condition within each target were significant for either dependent variable ($ps \geq .138$), all eight targets displayed mean differences in authenticity that were consistent with predictions (i.e., higher levels of authenticity in the anti-teleology condition). With respect to identity persistence, the differences were less consistent in direction and were generally extremely small in magnitude. Thus, these results confirm the findings of the aggregate analysis, and further suggest that the manipulation did not have pronouncedly different effects depending on the target in question.

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7 The same MANOVA was also run without excluding the participants for whom the manipulation malfunctioned (i.e., the non-responders and non-selectors). Results of this analysis were essentially similar; no effects of condition were observed.
An additional set of pre-registered exploratory analyses tested for the presence of indirect effects of condition on the dependent variables via the manipulation-check measure. Although the lack of an overall effect of condition violates traditional criteria for testing mediation (e.g., Baron & Kenny, 1986), Hayes (2009) maintains that indirect effects observed in the absence of total effects can still provide meaningful evidence of a mediated causal relationship (i.e., an effect of $X$ on $Y$ through $M$). Using the PROCESS macro for SPSS (Hayes, 2013), two mediation models were estimated, one with authenticity entered as the outcome variable ($Y$) and the other with identity persistence. In both models, the dichotomous condition variable ($1 = \text{anti-teleology}, 2 = \text{pro-teleology}$) was entered as the independent variable ($X$), and manipulation-check scores were entered as the mediating variable ($M$). Results of these models revealed negative indirect effects of condition via teleology-endorsement on both authenticity, $b = -.05, SE = .03, 95\% \text{ CI} = [-.12, -.01]$, and on identity persistence, $b = -.07, SE = .03, 95\% \text{ CI} = [-.16, -.02]$. These findings suggest that participants in the pro-teleology condition viewed targets as lower in authenticity and identity persistence, to the extent that they endorsed teleological thinking more. Although the direct effects predicted by the teleological account were not observed, these indirect effects are consistent with predictions and provide further evidence that the manipulation worked as expected among the subset of participants who experienced it as intended.

To test the overall associations between teleological reasoning and identity-related judgments in cases of moral change, bivariate correlations between the total number of initial statements endorsed by each participant, the manipulation-check scores, and the authenticity and identity-persistence variables were computed. Inasmuch as all participants had data on these measures, regardless of whether the manipulation had functioned as intended for them, these correlations were computed with the full sample. If teleology explains the centering of morality
in reasoning about personal identity, then indices of teleological tendencies should be negatively correlated with the perceived authenticity and identity persistence of targets whose moral character has changed for the worse. Although this prediction was not pre-registered, it nonetheless follows clearly from the teleological account. Consistent with this, the number of teleological statements initially endorsed exhibited significant negative correlations with authenticity \((r = -.13, p = .004)\) and identity persistence \((r = -.13, p = .003)\), and scores on the manipulation-check measure were also negatively associated with authenticity \((r = -.21, p < .001)\) and identity persistence \((r = -.24, p < .001)\). Although these correlations are by no means large, it is somewhat striking that the endorsement of teleological statements about basic processes in the natural world is predictive of judgments about personal identity at all. The number of initial statements endorsed was positively associated with the degree of endorsement for the second set of teleological statements \((r = .62, p < .001)\), suggesting that these two measures can be treated as largely interchangeable indices of teleological reasoning.
IMPROVED REPLICATION OF STUDY 2: METHODS

In light of the errors with the initial run of Study 2, a largely direct replication was conducted with those errors were corrected. This study was identical to the original version of Study 2, with the exceptions that a different item type was used to avoid the non-selection issues that occurred in the original version, and more robust measures were taken with participants who initially endorsed fewer than three teleological statements.

Participants

Participants in the Study 2 replication were North American adults recruited via Amazon’s Mechanical Turk crowdsourcing platform (MTurk; Buhrmester, Kwang, & Gosling, 2011). Based on the same power calculations used for the original version of the study, a Human Intelligence Task (HIT) was posted to MTurk and opened up for completion by 350 workers. Each participant was paid $1.00 upon completing the study. Workers who had previously participated in either Studies 4A or 4B were excluded from participation. A total of 471 MTurk workers began the study. Participants whose progress in the study was 48% or less (n = 39) provided no usable data, and accordingly these cases were deleted from the working data file altogether. Of the remaining 432 participants, 67 had not completed the dependent measures, and accordingly could not be included in the final analyses. Of the 365 participants with adequate data, two indicated at the conclusion of the study that they had not taken part in seriously or that their data otherwise should not be use; these cases were also deleted altogether. Finally, of the remaining 363 participants, 17 failed two or more embedded attention-checks and were excluded from the analysis, thus resulting in a final sample of 346 participants (190 women, 149 men, 3 gender-nonconforming, 4 not reporting gender). Ages in this final sample ranged from 18 to 74 (M = 38.51, SD = 13.14, 4 not reporting age), and the
primary ethnicities represented were White/European-American (72.5%), Black/African-American (12.1%), Hispanic/Latinx (4.3%), and East Asian (4.0%).

**Materials and Procedure**

The materials and procedure were identical to those used in the original version of Study 2, with two major exceptions. First, the rank-order items participants used in the original study to select statements to argue for vs. against were modified to a multiple-choice item format; this change helped avoid the issue of non-responding the rank-order items.

The second main modification to the study was also intended to deal with this issue. Separate branches were set up in the Qualtrics survey logic for participants who initially endorsed fewer than three teleological statements. In each condition, participants who endorsed 3 or more of the initial teleological statements completed the counter-argument task (anti-teleology condition) or the explanation task (pro-teleology condition) as described above. Participants who endorsed only one or two of the initial statements were automatically directed to generate counterarguments or explanations for the statements they had endorsed. Then, these participants were directed to select one (if they had initially endorsed two statements) or two (if they had initially endorsed one statement) of the teleological statements they had indicated were false, and were instructed to either explain why the selected statements were false (anti-teleology condition) or to play “devil’s advocate” and generate reasons the selected statements might be true (pro-teleology condition). Participants who indicated that all 10 of the initial statements were false ($n = 38$) were sent directly to this step, and were asked to select three statements and explain their falsehood (anti-teleology condition) or to play “devil’s advocate” for three statements (pro-teleology condition). These steps ensured that all participants in the anti-teleology condition were arguing against three teleological statements, and all participants in the pro-teleology
condition were arguing *in favor of* three teleological statements, regardless of how many statements they initially indicated were true or false.
STUDY 2 REPLICATION: RESULTS

Manipulation Check

An independent-samples $t$-test compared mean endorsement of the second set of teleological statements between the anti-teleology condition ($n = 162$) and the pro-teleology condition ($n = 184$). Results\(^8\) indicated a significant effect of condition, $t(321.13) = 4.47, p < .001, d = .48$, such that participants in the anti-teleology condition ($M = 3.93$) endorsed the statements less than those in the pro-teleology condition ($M = 4.60$). Thus, the manipulation appears to have successfully influenced participants’ willingness to engage in teleological reasoning\(^9\).

Primary Analysis

A one-way MANOVA was conducted with condition as a between-subjects factor and perceptions of targets’ authenticity and identity persistence entered as dependent variables. The multivariate test results indicate that the effect of condition overall was nonsignificant, $F(2, 343) = 1.03, p = .359, \eta^2_p = .006$. Mirroring this, the univariate tests indicate that there was neither a significant effect of condition on authenticity, $F(1, 344) = 1.76, p = .15, \eta^2_p = .005, d = .14$, nor on identity persistence, $F(1, 344) = 1.17, p = .281, \eta^2_p = .003, d = .12$. Although nonsignificant, the mean differences for both measures were in the predicted direction (i.e., higher in the anti-teleology condition; see the right portion of Figure 2).

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\(^8\) Levene’s test for equal variances was significant, $F = 6.63, p = .010$, and accordingly these results are reported with adjusted degrees of freedom.

\(^9\) An exploratory ANOVA indicated that the effect of condition on the manipulation-check measure was not moderated by the number of statements initially endorsed by participants (zero, one, two, or three-plus), $F(3, 338) = .904, p = .439, \eta^2_p = .01$. 
Exploratory Analyses

As in the original version of Study 2, mediation analyses were conducted to test for the presence of indirect effects of condition on the dependent measures, via the manipulation-check variable. In brief, these analyses indicated the indirect effect on authenticity was nonsignificant, $b = .03, SE = .04, 95\% CI = [-.12, .05]$, but a significant indirect effect was observed on identity persistence, $b = -.19, SE = .06, 95\% CI = [-.32, -.10]$. Thus, while indirect effects were observed for both dependent measures in the original study, the indirect effect for authenticity was not replicated. However, the indirect effect for identity persistence was replicated, and appears to be more robust here (i.e., confidence interval is farther from zero).

Additionally, the bivariate correlations were computed between the number of initial statements endorsed and the manipulation check-measure, on the one hand (these measures were correlated with each other at $r = .67, p < .001$), and the authenticity and identity-persistence measures, on the other. The number of statements endorsed was found to be negatively correlated with both authenticity ($r = -.16, p = .002$) and identity-persistence judgments ($r = -.26, p < .001$), while the manipulation-check measure was nonsignificantly correlated with authenticity ($r = -.06, p = .289$) and negatively correlated with identity persistence ($r = -.29, p < .001$). The uniform negativity of these correlations is consistent with a teleological account, inasmuch as it suggests that people more prone to teleological reasoning are inclined to see moral declines as more disruptive to personal identity in various ways.
STUDY 2: BRIEF DISCUSSION

The primary result predicted in Study 2 was a main effect of condition, such that perceptions of targets’ authenticity and identity persistence were expected to be higher in the anti-teleology than in the pro-teleology condition. Across both the original and the revised second attempt of the study, mean differences in this direction were observed, but these differences were not found to be statistically significant. These null findings may indicate that there is no true effect, or that the effect was too small to be reliably detected in this study (the a priori power analysis was based on an estimated effect size of $\eta^2_p = .03$, compared to the multivariate effect size of $\eta^2_p = .006$ observed in the replication study).

The findings of the secondary analyses are consistent with the existence of a small effect. The mediation analyses indicate that the manipulation of teleological belief had an indirect effect on the dependent measures (with the exception of authenticity in the revised study), via teleological reasoning as measured by the manipulation-check measure. The correlational analyses similarly indicate that higher levels of teleological thought are associated with perceiving negative moral changes as disruptive to identity. Coupled with the directionality of the mean differences, the overall consistency of these findings with the teleological account gives some assurance that the non-significant results of the primary test represent failures to detect a true effect, rather than indications that no effect exists. The procedures used in this study design represented a quite conservative test of the teleological hypothesis, as the domain in which teleological thought was manipulated (basic natural processes) was entirely unrelated to the domain of the outcome measures (judgments about personal identity). As such, the observation of so many predicted patterns in the data, even when the primary effects were not significant, is encouraging.
Assuming that there is a reliable effect of teleological thought on reasoning about identity, the findings of Study 2 suggest that it is likely very small. However, the effect sizes observed in the two versions of this study should not be taken as definitive evidence of the size of the effect, especially not at the level of the conceptual variables. Rather, at best these effect sizes are representative of the size of effect that can be obtained with these particular operationalizations of teleology and identity-related judgments. Although the manipulation had a healthy effect on the rate at which participants endorsed teleology in both versions of the study, it is still possible that stronger manipulations of teleological belief might be devised (e.g., manipulations that target teleological beliefs in multiple domains, rather than solely about the natural world, or manipulations that very directly and explicitly challenge teleology as a broad mode of explanation rather than challenging specific teleological beliefs). The dependent measures used in this study may also not have been as sensitive as possible to any effects of teleology (perhaps especially teleology as operationalized by the manipulation). The vignette-based measures are a relatively indirect means of assessing the perceived identity-relevance of morality; perhaps more direct reports of the moral relevance of traits, like those obtained in Study 1, would display larger effects.

Ultimately, the results of Study 2 do not provide incredibly strong evidence favoring the teleological account, but neither do they provide much evidence against it. The results are sufficiently consistent with the teleological account to be intriguing, and suggest that further investigations employing similar methods may be fruitful.
STUDY 3: METHODS

Study 3 tested the hypothesis that non-moral characteristics take on additional importance in identity-related judgments if those characteristics are perceived as related to the human telos. To this end, a manipulation of the perceived human telos was employed (i.e., telos as knowledge). The effects of this manipulation relative to a neutral condition were tested in the context of participants’ responses to cases of moral and non-moral personal change.

Participants

Participants in Study 3 were 535 undergraduate students (382 women, 141 men, 1 gender-nonconforming, 2 other gender identity, and 9 not reporting gender) recruited through the psychology subject pool at Texas A&M University and compensated with course credit. Ages in the sample ranged from 18 to 26 ($M = 18.72, SD = 1.05$), and most participants reported being either White (69%) or Hispanic/Latinx (24%).

Sample size was pre-determined with the goal of exceeding 80% power to detect a small-to-medium-sized interaction effect in a mixed MANOVA with a two-level between-subjects factor and a two-level within-subjects factor (target N for 80% power = 351; computed with G*Power, Faul et al., 2007). Of the original sample of 535 participants, 52 were excluded from analyses for failing comprehension check items (a pre-registered exclusion criterion; see the full pre-registration at http://aspredicted.org/blind.php?x=76f9mv), resulting in a final N of 483 included in analyses.

Materials and Procedure

In Study 3, participants were exposed to an article-based manipulation of the perceived human telos, the end or aim towards which people are naturally oriented. Participants were assigned to either a control condition or a telos-as-knowledge condition. A telos-as-morality
condition was not included in this study, as this was assumed to be the default position from which people will be operating, and thus participants in the neutral control condition were expected to display results consistent with a presumed moral telos for humanity. Following the article, participants responded to a set of personal-change vignettes, including one in which the target person experienced a decline in their moral character, and one in which the target’s intelligence declined, resulting in a 2 (telos: knowledge vs. control; between-subjects) x 2 (change type: moral vs. intelligence; within-subjects) mixed design.

Manipulation of Perceived Human Telos. Under the guise of a study of scientific literacy, participants were asked to read one of two articles. In the control condition, the article dealt with the practice of banding birds in ornithological research, a presumably innocuous topic. In the knowledge-telos condition, the article presented fictitious social-science findings implying that, above all else, human beings aim at acquiring knowledge. Reaching a state of understanding was portrayed as the end state towards which human activity is broadly oriented. See Appendix E for the full text of each article.

After reading the article, participants answered a set of brief comprehension questions to ensure they read and understood the articles. As mentioned above, 52 participants provided incorrect responses to one or more of these items, and were accordingly excluded from analyses. In addition, participants completed a three-item face-valid manipulation check measure assessing their endorsement of the idea that knowledge is the human telos. A corresponding set of items addressing morality as the human telos was also included for exploratory purposes. These items were presented as soliciting participants’ own opinions about topics that may have been addressed in the article they read (a number of filler items referring to birds and the natural environment were included to correspond to the content of the control article). The bracketed
text below reflects the morality versions of the items. Responses were made on a seven-point scale (1 = Strongly disagree, 7 = Strongly agree).

1. Human beings strive for knowledge and understanding [morality and virtue] above all else.
2. The achievement of knowledge [moral virtue] is a goal shared by all humans.
3. Developing knowledge and understanding [a morally virtuous character] is a central aim of human life.

Scores on the three knowledge-focused items will be averaged to yield a composite manipulation-check variable (M = 5.44, SD = 1.04, Cronbach’s α = .70), which was used both to gauge the efficacy of the manipulation and to test whether any effects of the telos manipulation on the dependent variables were mediated by knowledge-telos endorsement.

The three-morality-focused items were also averaged into a composite index of moral-telos endorsement (M = 4.68, SD = 1.25, Cronbach’s α = .79), and the resulting composite variable was used to examine whether suggesting that the human telos is knowledge actually undermines the perception that the human telos is morality.

To reinforce the cover story that Study 3 consisted of two separate studies, participants completed a brief set of demographic measures prior to being directed to the second part of the study, which was hosted at a separate URL.

Change Vignettes and Identity-Related Judgments. After completing the articles and associated measures, participants began a “second study” on person perception that was ostensibly unrelated to the study of science literacy. In this part of the study, participants read five vignettes similar to the ones presented in Study 2, in which targets underwent negative personal changes. Critically, two of the vignettes described targets who experienced a moral decline or a decline in intelligence (see Appendix F for the full text of these critical vignettes). To disguise these critical vignettes and reinforce the cover story, they were embedded among
three additional filler vignettes (describing targets that respectively undergo changes in their non-moral personality traits, gender identity, and food preferences). For each vignette, participants completed the same set of identity-related judgment items used in Study 2, resulting in separate measures of targets’ perceived authenticity and identity persistence for the moral-change case $(M_{\text{Auth}} = 2.84, SD_{\text{Auth}} = 1.41, \text{Cronbach’s } \alpha_{\text{Auth}} = .81; M_{\text{IDpersist}} = 3.50, SD_{\text{IDpersist}} = 1.55$ Cronbach’s $\alpha_{\text{IDpersist}} = .85$) and for the intelligence-change case $(M_{\text{Auth}} = 3.46, SD_{\text{Auth}} = 1.45$, Cronbach’s $\alpha_{\text{Auth}} = .82; M_{\text{IDpersist}} = 4.35, SD_{\text{IDpersist}} = 1.51$ Cronbach’s $\alpha_{\text{IDpersist}} = .86$).
STUDY 3: RESULTS

Manipulation Checks: Endorsement of Knowledge and Morality as the Human Telos

To gauge the efficacy of the manipulation, an independent-samples t-test compared scores on the manipulation check measures (i.e., knowledge-telos endorsement and moral-telos endorsement) between the control and knowledge conditions. Results\(^\text{10}\) indicated a significant difference on the knowledge-telos measure, \(t(464.68) = 2.40, p = .017, d = .22\). However, this difference was opposite to the predicted direction, and knowledge-telos endorsement was actually higher in the control condition (\(M = 5.55, SD = .92\)) than in the knowledge condition (\(M = 5.32, SD = 1.13\)). No effect of condition was found on moral-telos endorsement, \(t(478) = .85, p = .394, d = .07\). Participants in the control condition endorsed the view that humans’ purpose in life is to be moral (\(M = 4.73, SD = 1.21\)) to approximately the same extent as participants in the knowledge-telos condition (\(M = 4.64, SD = 1.29\)).

Primary Analysis

The primary hypothesis test in Study 3 was a 2 x 2 mixed MANOVA with condition (control vs. telos-as-knowledge) entered as a between-subjects factor, change type (moral vs. intelligence) entered as a within-subjects factor, and the two identity-related judgments (identity persistence and true-self/authenticity judgments) entered as dependent variables. The results indicated that the main effect of condition was not statistically significant, \(F(2, 476) = .14, p = .867, \eta^2_p = .001\). However, the main effect of change type was statistically significant, \(F(2, 476) = 75.00, p < .001, \eta^2_p = .24\), as was the two-way interaction between condition and change type, \(F(2, 476) = 3.47, p = .032, \eta^2_p = .01\).

\(^{10}\) Levene’s test for equality of variances was statistically significant for the knowledge-telos manipulation check, \(F = 10.06, p = .002\), and these results are accordingly reported with adjusted degrees of freedom.
The univariate results for each dependent measure indicated that the effect of condition was nonsignificant both for judgments of authenticity, $F(1, 477) = .27, p = .602, \eta^2_p = .001$, and identity persistence, $F(1, 477) = .10, p = .752, \eta^2_p = .000$, in keeping with the null multivariate effect. Significant main effects of change type were observed for both authenticity, $F(1, 477) = 61.87, p < .001, \eta^2_p = .12$, and identity persistence, $F(1, 477) = 132.18, p < .001, \eta^2_p = .28$, such that the target whose intelligence declined was judged to have greater authenticity and identity persistence ($M_{Auth} = 3.46, SD_{Auth} = 1.45; M_{IDPersist} = 4.35, SD_{IDPersist} = 1.51$) than the target whose moral character deteriorated ($M_{Auth} = 2.84, SD_{Auth} = 1.41; M_{IDPersist} = 3.50, SD_{IDPersist} = 1.55$). A significant univariate interaction between condition and change type was only observed for the identity persistence measure, $F(1, 477) = 4.88, p = .028, \eta^2_p = .01$; no interaction was detected for authenticity, $F(1, 477) = .38, p = .539, \eta^2_p = .001$. Results for both dependent measures are presented in Figure 3.

**Figure 3.** Identity-Related Judgments as a Function of Condition and Change Type, Study 3
To further probe the interaction observed for identity persistence judgments, the simple effects of change type within each condition were computed. Both conditions exhibited significant simple effects of change type (\( ps < .001 \)), such that the moral-decline target’s perceived identity persistence was lower than that of the intelligence-decline target. However, the magnitude of this difference was considerably larger in the control condition (\( M_{\text{diff}} = 1.01, d = .69 \)) than in the knowledge condition (\( M_{\text{diff}} = .69, d = .43 \)). The knowledge-telos condition thus appears to have led participants to reason more similarly about cases of moral decline and intelligence decline.

To further aid in interpreting this interaction, the simple effects of condition on identity-persistence judgments within each change type were also computed. Although neither of these simple effects were statistically significant (\( p = .156 \) and \( p = .363 \) for the simple effects within moral-change and intelligence-change cases, respectively), the pattern of means indicates that the knowledge condition essentially had opposite effects on how participants judged the identity persistence of the intelligence-change and moral-change targets. Specifically, the perceived identity persistence of the intelligence-change target was lower (\( d = .09 \)) in the knowledge condition (\( M = 4.28, SD = 1.56 \)) relative to the control condition (\( M = 4.41, SD = 1.46 \)), and the identity persistence of the moral-change target was perceived to be higher (\( d = .13 \)) in the knowledge condition (\( M = 3.60, SD = 1.62 \)) than in the control condition (\( M = 3.40, SD = 1.47 \)). While nonsignificant, these mean differences are consistent with the prediction that the knowledge condition would enhance the identity-disruptiveness of an intelligence decline and reduce the identity-disruptiveness of a moral decline.
Exploratory Analyses

Several exploratory analyses were conducted to examine additional patterns that may have bearing on the teleological account. These analyses were not included in the Study 3 pre-registration. First, a paired-samples t test compared participants’ endorsement of the knowledge-telos and moral-telos items, collapsing across conditions. Results indicated that a knowledge telos was endorsed at a higher rate overall ($M = 5.44, SD = 1.04$) than a moral telos ($M = 4.68, SD = 1.25$), $t(479) = 12.81, p < .001, d = .66$. This pattern is opposite to what would be expected on the view that perceiving people as having a moral telos is an intuitive default, but there is reason to suspect that these results do not reflect people’s baseline beliefs (see the Brief Discussion for Study 3 below).

Bivariate correlations were also computed between the knowledge-telos variable, the morality-telos variable, and responses to the moral-change vignette. The correlations between (1) the knowledge-telos variable and responses to the intelligence-change vignette and (2) the morality-telos variable and responses to the moral-change vignette were of particular interest, as it follows from the teleological account that perceiving something as the human telos should enhance the identity-relevance of traits related to that telos. The patterns observed are consistent with this (see Table 4; knowledge-telos endorsement was negatively associated with identity-related judgments about the intelligence-change target and moral-telos endorsement was negatively associated with identity-related judgments about the moral-change target. However, a largely similar pattern of negative relationships was also observed between endorsement of each telos and identity-related judgments of the targets corresponding to the other telos. Thus, there was a lack of specificity in the relationships. It may be that the telos-endorsement measures tap into a generalized teleological understanding of human nature, even
though they explicitly refer to particular purposes. Consistent with this, knowledge-*telos* endorsement and moral-*telos* endorsement displayed a moderate positive correlation with one another. In any case, the correlations between *telos* endorsement and identity-related judgments were all quite weak. Explicit beliefs about the human *telos* were not highly predictive of identity-related judgments in this data.

Table 4. Correlations Between *Telos* Endorsement and Identity-Related Judgments, Study 3.

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<td>Moral- <em>Telos</em> Endorsement</td>
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<td>Authenticity: Intelligence Change</td>
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<td>Identity Persistence: Intelligence Change</td>
<td>-.09*</td>
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<tr>
<td>Authenticity: Moral Change</td>
<td>-.08†</td>
<td>-.13**</td>
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<tr>
<td>Identity Persistence: Moral Change</td>
<td>-.13**</td>
<td>-.14**</td>
<td>.21***</td>
<td>.44***</td>
<td>.31***</td>
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Note: † = p < .10, * = p < .05, ** = p < .01, *** = p < .001
STUDY 3: BRIEF DISCUSSION

Overall, the results of Study 3 were mixed. The opposite-to-predicted results obtained for the manipulation check suggest that the control condition was not in fact neutral with respect to the manipulated variable, but instead that reading about the practice of bird banding may have led participants to endorse the view that the human telos is seeking knowledge more than the explicit message to this effect in the knowledge condition. In hindsight, any article about a science-related topic, especially one focusing as much on the activity of human scientists as the control article in this study did, has the potential to imply that knowledge-seeking is an important human activity. However, it is nonetheless surprising that this article resulted in greater endorsement of a knowledge telos than the knowledge-condition article, which explicitly argued and provided evidence that humans inherently aim at knowledge acquisition.

It may be that the very direct approach taken by the knowledge-condition article in arguing for its conclusion engendered psychological reactance (e.g., Brehm & Cole, 1966; Brehm & Sensenig, 1966) among some participants, leading them to report less agreement with the knowledge-telos view as a means of asserting their agency in the face of this direct influence attempt. By contrast, the control article may have unintentionally functioned as a less-direct argument for the same conclusion, and perhaps by virtue of its indirectness did not arouse as much reactance. In any event, it seems that the control condition in this study may not have been neutral, and this seems to be a likely explanation for the surprising finding that knowledge-telos endorsement was higher than moral-telos endorsement across both conditions.

In spite of the failure of the manipulation according to the manipulation-check results, the pattern of results observed for identity-persistence judgments, although weak, was consistent with the predictions of the teleological account. Participants who received a direct knowledge-
telos message showed a smaller effect of change type on their identity-persistence judgments than those in the control condition, indicating that they were reasoning more similarly about moral-change and intelligence-change cases. This reduction in the effect of change type appears to have resulted from knowledge-condition participants perceiving intelligence declines as slightly more disruptive to personal identity, and perceiving moral declines as slightly less disruptive to identity, relative to control-condition participants. While the issues with the manipulation check make this study difficult to interpret, the fact that any predicted patterns of results were observed at all is promising, and more pronounced patterns that also extend to authenticity judgments might be obtained in similar studies with methodological improvements.
STUDIES 4A AND 4B: METHODS

Studies 4A and 4b examined the more general claim that purposive functioning, not trait content per se, is a primary determinant of identity-related judgments. If morality is seen as central to identity only to the extent that it is seen as purposive, a moral change that does not interrupt purposive activity should be less disruptive to identity-related judgments than one that does. Similarly, a non-moral change that interferes with purposive activity should be seen as more disruptive to identity than one that does not.

Studies 4A and 4B made use of procedures adapted from work by Strohminger and colleagues (Strohminger & Nichols, 2014; Heiphetz et al., 2017) and De Freitas et al. (2017b), in which participants were confronted with hypothetical changes in various entities’ characteristics. In Study 4A, all of the entities in question were persons, and all of the changes they underwent were negatively-valenced, inasmuch as prior work has demonstrated that negatively-valenced changes are more disruptive to judgments of identity persistence and authenticity (Newman et al., 2014; De Freitas et al., 2017b). The primary aim of Study 4A was to examine how the addition of a manipulation of purposiveness might moderate these well-established effects.

In Study 4B, all of the changes undergone by the targets were positive; this was the only respect in which the two studies differed. Prior evidence suggests that changes for the better are typically perceived as identity-preserving and as bringing individuals closer to their true selves (Newman et al., 2014; Bench et al. 2015; De Freitas et al., 2017b). As such, in Study 4B teleological considerations were very directly pitted against normative considerations – the change-type manipulation should be driving increases in judgments of targets’ authenticity and identity persistence, while the purpose manipulation should be driving decreases in targets’ perceived authenticity and persistence. Thus, Studies 4A and 4B both tested the impact of
introducing a purpose-based factor into scenarios with documented prior effects on identity-related judgments.

**Participants: Study 4A**

Participants in Study 4A were North American adults recruited via Mechanical Turk platform. An initial target sample size of 350 was selected in order to exceed 80% power to detect small effects in a 2 x 2 repeated-measures ANOVA (target $N$ for 80% power = 277; computed using G*Power, Faul et al., 2007). To meet the target $N$ of 350 after anticipated data exclusions, the study was launched on MTurk for completion by 375 workers.

A total of 454 MTurk workers began the study. Participants whose progress in the study was 19% or less as calculated by Qualtrics ($n = 60$) did not progress past the study’s instructional stage and thus provided no data whatsoever, and accordingly these cases were deleted from the working data file altogether. Of the remaining 394 participants, 382 had sufficient data to be included in the primary analyses (i.e., responses to the dependent measures for at least one moral and one non-moral target). Of these, three indicated that they had not taken part in the study sincerely and that their data should not be used (a pre-registered exclusion criterion). These cases were also deleted from the working data file, for a final sample size of 379 participants (189 women, 177 men, 1 trans woman, 1 gender nonconforming individual, 11 not reporting gender). Ages ranged from 18 to 78 ($M = 35.70$, $SD = 10.71$), and the main ethnicities represented in the sample were White/European-American (72.6%), Black/African-American (7.9%), East Asian (6.3%), and Hispanic/Latinx (5.0%).

**Participants: Study 4B**

Mirroring Study 4A, participants in Study 4B were North American adults recruited from MTurk, and the sample size was determined in an identical fashion. To achieve the target sample
size with anticipated data exclusions, a HIT was posted to MTurk and opened up to a total of 375 workers. Participants who had completed Study 4A were excluded from participating.

A total of 425 MTurk workers began the study. As in Study 4A, participants whose progress in the study was 19% or less (n = 33) did not progress past the study’s instructions and thus provided no data. Of the remaining 392 participants, 377 had sufficient data to be included in the primary analysis (i.e., scores on the dependent measures for at least one moral and one non-moral target). Of these, two indicated that their data should not be used on the seriousness-check item, resulting in a final sample of 375 (233 women, 138 men, 1 trans man, 3 not reporting gender). Ages in the sample ranged from 18 to 73 (M = 36.27, SD = 11.16), and the main ethnic groups included were White/European-American (69.9%), Black/African-American (12.8%), Hispanic/Latinx (6.1%), and East Asian (4.8%).

**Materials and Procedure: Both Studies**

Each participant evaluated four scenarios describing cases of personal change, including two in which the target underwent moral changes, and two in which the target underwent non-moral changes. Participants then made judgments about how these changes would affect the target’s identity if they did or did not interfere with the target’s purposive activity. Thus, a 2 (change type: moral vs. non-moral) × 2 (purpose: disrupted vs. unaffected) within-subjects design was employed.

*Change Vignettes.* Participants read four vignettes in a random order, each of which centered on a character occupying a different functional role (namely *doctor, mother, artist,* or *scientist*). The vignettes opened with a brief introduction to the character, in which their functional role was identified and the character was described as undergoing a significant personal change. For each vignette, participants either read a version in which the target
underwent a change in moral character, or one in which the target underwent a change in their non-moral personality traits. In Study 4A, these changes were negative (e.g., severing ties with family in the moral domain; becoming more anxious in the personality domain), while in Study 4B, these changes were positive (e.g., making amends with family in the moral domain; becoming less anxious in the personality domain). Personality traits were chosen as the domain of non-moral change given prior evidence that they are reliably seen as less identity-related than moral character traits, but more identity-related than other types of personal characteristics (e.g., Strohminger & Nichols, 2014). The full vignettes can be found in Appendix G. Participants evaluated two moral-change vignettes and two personality-change vignettes.

For each vignette that they read, participants considered two different endings, one in which the character’s purposive activity was disrupted as a result of the change, and one in which the character’s purposive activity was unaffected by the change. Each of these endings was accompanied by its own set of identity-related dependent measures.

Identity-Related Judgments. After reading each version of the vignette, participants completed measures addressing identity-related judgments about the target. These items were identical to those used in Studies 2 and 3, but adapted to pertain to the specific target in each vignette. As mentioned previously, for each target participants completed two sets of dependent measures: one for the purpose-disrupted ending of the vignette and one for the purpose-unaffected ending. Averaging the corresponding measures together across the moral and non-moral vignettes thus resulted in eight composite variables, reflecting the four possible combinations of the levels of change type and purpose for each of the two dependent variables.

Additional Measures. While the identity-related judgments are the primary dependent measures in Studies 4A and 4B, participants also completed items addressing targets’ perceived
morality ("After this change, to what extent is [Target Name] a morally good person?" 1 = Not at all, 7 = Extremely) and perceived purposiveness ("After this change, to what extent is [Target Name] still fulfilling their purpose in life?" 1 = Not at all, 7 = Completely). These items were intended primarily as manipulation checks to assess whether the change type and purpose variables functioned as intended. As with the identity-related judgments, participants completed these items separately for the purpose-disrupted and purpose-unaffected versions of each vignette. This resulted in eight variables, reflecting perceptions of the targets’ morality and purposiveness within each of the four possible intersections of the levels of the change type and purpose factors.
STUDIES 4A AND 4B: RESULTS

Study 4A

*Manipulation Checks.* To gauge the efficacy of the manipulations, as well as to test for the presence of possible crossed effects (i.e., effects of change type on perceptions of purposiveness and effects of purpose on perceptions of morality), a repeated-measures MANOVA was conducted, with change type and purpose entered as within-subjects factors and perceptions of morality and purposiveness entered as dependent variables. The multivariate tests indicated a main effect of change type, \( F(2, 374) = 231.18, p < .001, \eta^2_p = .55 \), a main effect of purpose, \( F(2, 374) = 320.47, p < .001, \eta^2_p = .63 \), as well as a significant interaction between the two, \( F(2, 374) = 7.17, p = .001, \eta^2_p = .04 \).

The univariate tests of the effect of change type on morality and the effect of purpose on purposiveness represent the primary tests of the manipulations’ efficacy. For morality, results indicated a significant effect of change type, \( F(1, 375) = 463.49, p < .001, \eta^2_p = .55, d = 1.17 \), such that moral-change targets were perceived as less moral (\( M = 3.07 \)) than personality-change targets (\( M = 4.54 \)). A main effect of the purpose factor on purposiveness was also observed, \( F(1, 375) = 636.15, p < .001, \eta^2_p = .63, d = 1.42 \), such that targets were judged to be fulfilling their purposes in life less in purpose-disrupted cases (\( M = 2.67 \)) than in purpose-unaffected cases (\( M = 4.55 \)). Thus, both manipulations seem to have successfully influenced the target perceptions.

The univariate tests of the effect of change type on purposiveness, and of purpose on morality, test for the presence of crossed effects. A significant effect of change type on purposiveness was observed, \( F(1, 375) = 125.93, p < .001, \eta^2_p = .25, d = .27 \), such that moral-change targets were judged to be fulfilling their life purposes less (\( M = 3.30 \)) than personality-change targets (\( M = 3.65 \)). A significant effect of purpose on morality was also observed, \( F(1, 375) = 636.15, p < .001, \eta^2_p = .63, d = 1.42 \), such that targets were judged to be fulfilling their purposes in life less in purpose-disrupted cases (\( M = 2.67 \)) than in purpose-unaffected cases (\( M = 4.55 \)). Thus, both manipulations seem to have successfully influenced the target perceptions.
375) = 216.42, \( p < .001, \eta_p^2 = .37, d = .63 \), such that purpose-disrupted targets were judged to be less moral (\( M = 3.41 \)) than purpose-unaffected targets (\( M = 4.20 \)). These results show that each factor (change type and purpose) had a crossover effect; the change type factor affected perceptions of purposiveness and the purpose factor affected perceptions of morality. Notably, these crossed effects were both smaller than the effects on the target variables, indicating that each factor was primarily influencing perceptions of the target variable, but that their effects also spilled over onto the other variables. It is also notable that the crossed effect of change type on purposiveness was smaller than the crossed effect of purpose on morality; the disruption vs. continuation of purposive functioning had more of an impact on moral evaluations than moral content had on perceptions of purposiveness.

A univariate two-way interaction between change type and purpose was also observed for the purposiveness variable, \( F(1, 375) = 14.30, p < .001, \eta_p^2 = .04 \). An examination of the simple effects of change type within each level of purpose indicated that the effect of change type on purposiveness was smaller in purpose-disrupted cases (\( d = .35 \)) than in purpose-unaffected cases (\( d = .60 \)). No such interaction was observed for the morality variable, \( F(1, 375) = .83, p = .364, \eta_p^2 = .002 \).

**Primary Analysis.** A 2 (change type) x 2 (purpose) repeated-measures MANOVA was conducted in which the two identity-related judgments (identity persistence and true-self/authenticity judgments), averaged across the four vignettes, as the dependent measures. Results of this analysis are presented in the left portion of Figure 4. The multivariate tests indicated a main effect of change type, \( F(2, 377) = 34.72, p < .001, \eta_p^2 = .16 \), a main effect of purpose, \( F(2, 377) = 273.38, p < .001, \eta_p^2 = .59 \), and a significant two-way interaction, \( F(2, 377) = 3.92, p = .021, \eta_p^2 = .02 \).
Figure 4. Identity-Related Judgments by Change Type and Purpose, Studies 4A & 4B.

The univariate tests indicated that the multivariate effects largely held up for each of the dependent measures (see Figure 4). For authenticity, a main effect of change type was observed, \( F(1, 378) = 46.82, p < .001, \eta_p^2 = .11, d = .27 \), such that targets in the moral-change cases were on average judged to be less authentic \((M = 3.47)\) than personality-change targets \((M = 3.82)\). A main effect of purpose was also seen for authenticity, \( F(1, 378) = 500.70, p < .001, \eta_p^2 = .57, d = 1.24 \), such that targets were evaluated as much less authentic in purpose-disrupted cases \((M = 2.83)\) than in purpose-unaffected cases \((M = 4.46)\).

Overall, the pattern of main effects for authenticity is highly consistent with the predictions derived from the teleological account; whether or not targets continued to fulfill their purpose had a much greater impact on judgments of their authenticity than the nature of the personal changes they underwent. These main effects were also qualified by a significant
interaction between change type and purpose for the authenticity measure, $F(1, 378) = 6.86, p = .009, \eta^2_p = .02$. Post-hoc tests of the simple effects of change type within each level of purpose revealed a significant effect of change type in the same direction across both levels of the purpose factor. However, the magnitude of this effect was greater in purpose-unaffected ($d = .34$) than in purpose-disrupted cases ($d = .19$).

For the identity persistence measure, results indicated a main effect of change type, $F(1, 378) = 58.69, p < .001, \eta^2_p = .13, d = .32$, such that targets were judged to be less the same person in moral-change cases ($M = 3.53$) than in personality-change cases ($M = 3.94$). A main effect of purpose on identity persistence was also found, $F(1, 378) = 397.70, p < .001, \eta^2_p = .51, d = 1.04$, such that targets were judged to be less the same person in purpose-disrupted cases ($M = 3.05$) than in purpose-unaffected cases ($M = 4.42$). An interaction approaching significance was also observed, $F(1, 378) = 3.76, p = .053, \eta^2_p = .01$. As with authenticity, an examination of the simple effects of change type within each level of purpose indicated that the effect of change type was somewhat smaller in purpose-disrupted cases ($d = .25$) than in purpose-unaffected cases ($d = .38$).

**Study 4B**

*Manipulation Checks.* As in Study 4A, a repeated-measures MANOVA assessed the effects of change type and purpose on perceptions of targets’ morality and purposiveness. The multivariate test results indicated a main effect of change type, $F(2, 371) = 28.72, p < .001, \eta^2_p = .13$, and a main effect of purpose, $F(2, 371) = 3.87, p = .022, \eta^2_p = .02$, but no interaction between the two, $F(2, 371) = .26, p = .771, \eta^2_p = .001$.

Examining the univariate tests for the primary manipulation checks (i.e., effects of change type on morality and of purpose on purposiveness) indicated a significant effect of
change type on morality, $F(1, 372) = 8.10, p = .005, \eta_p^2 = .02, d = .08$, such that moral-change targets were perceived as more moral ($M = 5.25$) than personality-change targets ($M = 5.16$). A significant effect of purpose on perceived purposiveness was also observed, $F(1, 372) = 4.60, p = .033, \eta_p^2 = .01, d = .12$, such that targets were judged to be fulfilling their life purposes less in purpose-disrupted cases ($M = 4.67$) than in purpose-unaffected cases ($M = 4.83$). Thus, both factors appear to have successfully influenced the corresponding target perceptions. However, these effects were much smaller than the corresponding effects in Study 4A; this issue is revisited in the general discussion.

Turning to the crossed effects, a main effect of change type on purposiveness was observed, $F(1, 372) = 57.43, p < .001, \eta_p^2 = .13, d = .26$, such that moral-change targets were perceived as fulfilling their purpose in life more ($M = 4.92$) than personality-change targets ($M = 4.58$). A main effect of purpose on perceived morality was also observed, $F(1, 372) = 6.97, p = .009, \eta_p^2 = .02, d = .15$, such that targets were perceived as less moral in purpose-disrupted cases ($M = 5.12$) than in purpose-unaffected cases ($M = 5.29$). It is notable that in Study 4B, both crossed effects were larger in magnitude than the effects on the primary manipulation-check variables. No univariate interactions were observed for either dependent variable ($ps \geq .495$).

**Primary Analysis.** As in Study 4A, the primary hypotheses were tested with a 2 (change type: moral vs. non-moral) x 2 (purpose: disrupted vs. unaffected) repeated-measures MANOVA, with the composite measures of authenticity and identity persistence entered as the dependent measures. The multivariate test results indicated a main effect of change type, $F(2, 372) = 34.66, p < .001, \eta_p^2 = .16$, and a main effect of purpose, $F(2, 372) = 6.49, p = .002, \eta_p^2 = .03$, but no two-way interaction between them, $F(2, 372) = .587, p = .556, \eta_p^2 = .003$. The results of this analysis are presented in the right portion of Figure 4.
Univariate test results for the authenticity measure mirrored the multivariate test results. A significant main effect of change type was observed, $F(1, 373) = 69.45, p < .001, \eta^2_p = .16, d = .42$, such that moral-change targets were evaluated as more authentic ($M = 4.84$) than personality-change targets ($M = 4.46$). The main effect of purpose on authenticity was also significant, $F(1, 373) = 4.99, p = .026, \eta^2_p = .01, d = .16$, such that purpose-disrupted targets ($M = 4.55$) were seen as less authentic than purpose-unaffected targets ($M = 4.72$). As in the multivariate results, no interaction between change type and purpose was seen for authenticity, $F(1, 373) = 1.17, p = .280, \eta^2_p = .003$.

Overall, the univariate results for identity persistence displayed a weaker pattern relative to the multivariate results. A significant main effect of change type was observed, $F(1, 373) = 4.12, p = .043, \eta^2_p = .01, d = .10$, such that the identities of moral-change targets were perceived to persist slightly more ($M = 4.17$) than that of personality-change targets ($M = 4.07$). No main effect of purpose was found, $F(1, 373) = .31, p = .579, \eta^2_p = .001, d = .02$; the identity of purpose-disrupted targets was seen as no less persistent ($M = 4.14$) than that of purpose-unaffected targets ($M = 4.11$). No interaction was observed for identity persistence either, $F(1, 373) = .76, p = .385, \eta^2_p = .002$.

Even though no significant two-way interactions were observed, the simple effects of change type within each level of purpose, and those of purpose within each level of change type, were examined for the sake of providing a more in-depth comparison with the results of Study 4A. For change type, both simple effects on authenticity were significant (both $ps \leq .001$), although the effect was somewhat larger in magnitude in purpose-unaffected cases ($d = .36$) than in purpose-disrupted cases ($d = .20$). For identity persistence, the simple effect of change type in purpose-disrupted cases was negligible ($p = .672 d = .03$), but in purpose-unaffected cases the
simple effect of change type was marginal ($p = .058, d = .12$), such that moral-change targets’ identity persistence ($M = 4.18$) was judged to be greater than that of personality-change targets ($M = 4.03$). For purpose, only one out of the four simple effects was statistically significant (all other $ps \geq .335$), namely the simple effect of purpose on authenticity judgments for moral-change targets ($p = .016, d = .18$). These targets were evaluated as less authentic in purpose-disrupted cases ($M = 4.72$) than in purpose-unaffected cases.
STUDIES 4A AND 4B: BRIEF DISCUSSION

In both studies 4A and 4B, the primary predicted result was a main effect of the purpose variable, such that targets’ perceived identity persistence and authenticity would be attenuated in purpose-disrupted cases relative to purpose-unaffected cases. This predicted effect was observed at the multivariate level in both studies. At the univariate level, the effect was found for both dependent variables in Study 4A (with large effects; \(ds > 1.00\)), but was only observed for authenticity in Study 4B (where the effect was much smaller; \(d = .16\)). This suggests that, when changes are positive, whether or not a person is able to fulfill their social-role purposes afterwards simply matters less than when changes are negative (perhaps to the point of not mattering at all for judgments of identity persistence). In cases of negative change, however, purpose appears to have been the primary factor driving identity-related judgments. The purpose effects in Study 4A were so pronounced that they made the difference between targets being judged to be largely authentic and the same person after the changes (means above the scale midpoint for both moral and non-moral targets in purpose-unaffected cases) versus being seen as largely inauthentic and no longer the same person (means approaching the lower limits of the scale in purpose-disrupted cases).

Main effects of change type were also anticipated in both studies, on the basis of the prior evidence that the true self is assumed to be morally good by default. These effects were observed for both dependent measures in both studies, and were in opposite directions in each study, consistent with predictions (i.e., moral-change lower in authenticity and identity persistence in Study 4A, higher in Study 4B). In Study 4A, the effect of change type on authenticity \((d = .27)\) was actually smaller than that observed in Study 4B \((d = .42)\), while the effect of change type on identity persistence was larger in Study 4A \((d = .32)\) than in Study 4B \((d = .10)\). Overall, these
patterns indicate a replication of the basic finding that morality carries more weight than other information in reasoning about identity. The differences across the two studies suggest that negative vs. positive moral changes may differ in their impact on perceptions of authenticity on the one hand (where positive changes seem to have a greater impact), and identity persistence on the other (where negative changes seem to have a greater impact). However, because the valence of changes was not manipulated within a single study, these conclusions remain tentative.

While an interaction between change type and purpose, as observed in Study 4A, was anticipated as a possibility, this finding was not a central prediction derived from the teleological account. Even though the interaction effects did not meet significance criteria in Study 4B, a broadly similar pattern of simple effects was observed, such that the impact of the change type factor appears to have been smaller in purpose-disrupted cases than in purpose-unaffected cases. In other words, when targets’ fulfillment of their social-role purposes was disrupted after the change, whether that change was moral vs. non-moral in nature had less of an impact on identity-related judgments. By contrast, an examination of the simple effects of purpose within change type did not indicate a consistent pattern across the studies. Inasmuch as purpose appears to have consistently moderated the effect of change type across the studies, but not the other way around, this may imply that purpose-related information is more primary or fundamental in reasoning about personal identity. However, given that significant interactions were only observed in Study 4A, this is highly speculative and further research is needed to determine whether these patterns are truly robust and replicable before making strong claims about their meaning.

The results for the analyses of the manipulation-check variables (perceptions of targets’ morality and purposiveness) are also informative about the possible interplay between normative and teleological processes. In both studies, the change type and purpose variables were found to
influence not only the corresponding manipulation check variables, but also to have crossover effects on the other variable (i.e., effects of change type on purposiveness and effects of purpose on morality were observed). The observation of these crossover effects might be interpreted as indicating that the manipulations of morality and purpose were confounded with one another, and thus that these variables cannot be taken as pure manipulations of the target constructs. On this view, drawing inferences about the primary dependent measures is problematic. Another interpretation of these crossover effects is that this is exactly what a teleological account predicts. If teleology explains why morality is centered in reasoning about identity, then moral changes should be perceived as affecting people’s purposive functioning, and changes in people’s ability to fulfill their social-role purposes should be perceived as affecting their moral character.

All in all, then, the results of Studies 4A and 4B provided evidence that is largely consistent with the predictions of the teleological account. However, the findings of these studies (particularly Study 4B) have also raised additional questions about the exact nature of the interplay between valence, trait content, and purpose as factors contributing to identity-related judgments. These questions are taken up in the general discussion.
SUMMARY AND GENERAL DISCUSSION

Across five studies, each testing in some way the broad hypothesis that teleological reasoning accounts for the centering of morality in folk reasoning about identity, the resulting evidence was somewhat mixed. Two of the studies yielded results that were unambiguously consistent with predictions, namely Study 1 and Study 4A. In Study 1, traits belonging to the two high-morality categories (those low and high in warmth) were perceived to be more purpose-relevant, as well as more central to identity, than non-moral warm or ability-related traits. Study 1 thus replicated the basic finding that moral traits are regarded as particularly central to individual identity relative to other kinds of traits and personal characteristics (e.g., Goodwin et al., 2014; Strohminger & Nichols, 2014; Heiphetz et al., 2017), and built upon these prior findings by showing that moral traits are also perceived as purpose-relevant. In Study 4A, whether or not targets were still able to effectively fulfill their social-role purposes after a negative change had a much larger impact on identity-related judgments than whether the change was moral or non-moral in nature. This replicates the basic pattern observed by Rose et al. (2017) in reasoning about the identity of non-persons; these authors also observed normative effects but found them to be overshadowed by the effects of purpose. This pattern of results is consistent with the idea that perceptions of purpose are a more primary driver of identity-related judgments than the kind of change a person has undergone, at least in cases of negative change.

Of the three remaining studies, Study 4B was also largely consistent with predictions, although the results were not as uniform and straightforward as those of Studies 1 and 4A. The predicted main effect of the purpose factor was observed at the multivariate level and at the univariate level for authenticity, but a univariate main effect of purpose was not found for identity persistence. Additionally, the effects of purpose in this study were found to be both
smaller than those of change type, opposite to the pattern seen in Study 4A, and smaller overall than the effects of purpose seen in Study 4A. Thus, while suggesting that purposes still matter in cases of positive change, Study 4B shows that they matter less in cases of positive change. While the effects of the purpose factor on the dependent measures were found to be smaller in this case, the unexpected finding that the purpose factor actually influenced targets’ perceived morality more than purposiveness, and that change type actually influenced purposiveness more than perceived morality, provides further evidence that teleological processes were at play in this study and that morality and purpose are conceptually intertwined in folk psychology.

Studies 2 and 3 each yielded results that were at least somewhat suggestive of teleological patterns, but less clearly so than the other three studies. Both versions of Study 2 failed to find significant effects of an experimental manipulation of general teleology could elicit the predicted differences in identity judgments, however there were promising results in terms of the indirect effects and correlational findings using individual differences in teleological thinking. Study 3 provided some support for the hypothesis that inducing people to believe in a human telos other than morality would increase the identity-relevance of traits pertaining to that telos. However, the predicted pattern was only observed for one of the two dependent variables, and the interpretation of this study is complicated by the opposite-to-predicted results for the manipulation check. Still, the fact that any predicted patterns were observed at all is encouraging.

In sum, the five studies reported here provide a mixed bag of evidence with respect to the teleological account of the moral-essentialism phenomenon in personal identity. The results obtained in Studies 1 and 4A were clearly consistent with the predictions of the teleological account. The results of the other studies, while each ambiguous for different reasons, nonetheless always contained at least some patterns consistent with the account, and hints that the methods
adopted in these studies were appropriate and could be modified to yield clearer evidence in future research. Further, results clearly contrary to the teleological account were not obtained in any of the five studies. As such, one may cautiously conclude that these studies provide more evidence in favor of the teleological account than against it. However, different methodologies and even larger sample sizes may be needed to more reliably detect teleological effects.

**Evaluating the Teleological Account: Two Central Claims**

It is worth considering how the findings of these studies bear on two central claims of the teleological account, namely the claim that *teleological reasoning causally produces moral essentialism in reasoning about personal identity*, and the related but distinct claim that *people conceive of the human telos as moral goodness, specifically.*

*Teleology Causes Moral Essentialism.* Study 2 offered the most direct test of the first claim, but the internal validity of the initial version was compromised by the errors that occurred, and the second version yielded results that were somewhat ambiguous. A conservative interpretation of these results would be that they provide limited to no evidence of an effect, and if there is an effect it is likely small. However, as addressed in the brief discussion of Study 2, there is reason to be optimistic that larger, more reliable effects could be obtained with modifications to the manipulation and/or dependent measures. The indirect effects observed in this study also provide some evidence in support of this claim, even in the absence of significant direct effects. Overall the results are suggestive that teleology may at least be a partial contributor to moral-essentialism effects, even if it does not fully explain them.

Study 3 also bears on the claim that teleology causes moral essentialism, albeit less directly than Study 2. The findings for the identity-persistence variable in Study 3 suggest that identifying a certain end state (i.e., knowledge) as the human *telos* led to the perception that traits
relevant to achieving that end (i.e., intelligence) were more central to personal identity. Thus, if morality is indeed seen as the human telos, these findings imply that this could in turn lead to moral essentialism. However, the unexpected opposite-to-predicted effect on the manipulation check measure indicates that this study should be interpreted cautiously, and predicted patterns were not found for authenticity judgments. So, while predicted patterns were obtained for the identity-persistence measure, ultimately the safest conclusion to draw from Study 3 is similar to that from Study 2: The results suggest it is possible for teleological processes to influence perceptions of traits’ identity centrality.

Studies 4A and 4B also have bearing on this claim, although these studies tested this claim less directly than Study 2. In these studies, the effects of a purpose factor on identity-related judgments were evident (particularly in Study 4A), broadly implying that when a purpose (e.g., a social-role function like being an artist) is ascribed to a person, this purpose becomes seen as at least relatively central to their identity. Conceptually, these findings are similar to the findings for identity persistence in Study 3, only in Studies 4A and 4B the purpose factor was at the level of specific social roles rather than at the level of humans as a broad category. Since there were no factors clouding the interpretation of these studies, they provide the clearest support for the broad idea that people readily draw inferences about identity on the basis of perceived purposes. This implies that, assuming people do perceive moral goodness as the human telos, this would contribute to morally good traits being essentialized as the perceived core of personal identity.

Overall, the present studies do not provide strong direct evidence that teleology causes moral essentialism in reasoning about personal identity. However, they do provide clear evidence that teleological reasoning, broadly speaking, affects the degree to which different traits and
patterns of behavior are seen as central to personal identity. By supporting this broad claim, the present studies provide indirect support for the more specific claim that perceiving moral goodness as the human telos explains why morality is essentialized in the folk psychology of personal identity. In sum, the present studies provide preliminary support for this claim, and inspire hope that it is amenable to being tested directly.

Default Belief in a Moral Human Telos. For the claim that people perceive morality as the human telos at baseline, the most pertinent evidence comes from Studies 1, 3, 4A, and 4B. In Study 1, the finding that moral traits (both those low and high in warmth) were perceived as more purposive than the two types of non-moral traits is consistent with this claim. Although people did not deny that non-moral warm traits or ability-related traits were purpose-relevant altogether, these traits were seen as markedly less purpose-relevant than morality. While this study did not exhaustively compare moral content to all other kinds of trait content, it at least shows that the perceived human telos closer to moral goodness than to interpersonal warmth or the cultivation of different kinds of ability.

Study 3 was the only study in the series to include a direct measure of moral-telos endorsement, as well as a measure of knowledge-telos endorsement that it may be compared against. As reported in the Study 3 results, it was found that overall, endorsement of a knowledge telos was considerably greater than endorsement of a moral telos in this study. However, due to the opposite-to-predicted effect of condition on knowledge-telos endorsement, it seems likely that the control condition was non-neutral in this study, and thus the scores for endorsement of both kinds of telos in that condition may not truly reflect participants’ baseline views. Thus, even though the pattern of means taken at face value speaks against a default perceived moral telos, it is unwise to take them at face value. Setting aside the pattern of means, both a moral and a
knowledge *telos* were endorsed at a fairly high rate overall (means above scale midpoints) and were found to be positively correlated with one another. So, while not specifically pointing to a default moral *telos*, Study 3 provides some support for the idea that people are broadly accepting of teleological understandings of human nature.

Studies 4A and 4B also furnished some evidence that bears on this claim, namely in the form of the crossed effects observed on the manipulation-check variables (i.e., effects of change type on targets’ perceived purposiveness, and effects of purpose on perceived morality). It seems that people intuitively perceive that moral changes impact purposive functioning, and that changes in purposive functioning impact moral character. As initially addressed in the brief discussion of these studies, these patterns are exactly what would be expected if people do conceive of the human *telos* as robustly moral.

Overall, the present studies provide stronger support for the claim that people perceive a moral human *telos* at baseline than for the claim that teleology is the causal mechanism underlying moral essentialism in personal identity. Various indicators across these studies suggest that, all else being equal, people tend to see moral traits and changes to those traits as more closely linked to humans’ purpose than other kinds of traits.

**Broader Theoretical Implications**

Beyond their direct bearing on the teleological account of moral-centering effects, the present findings are also relevant for several other areas of theory and empirical inquiry in psychology. In particular, these results carry implications for the general domains of teleological and normative reasoning (and their role in identity-related perceptions and judgments), the distinction between authenticity and identity-persistence judgments, and the psychological relationship between kind-level and individual-level identity.
Implications for Teleological Reasoning and Identity. Although some elements of the teleological account of moral-centering effects were not unambiguously supported in the present studies, they nonetheless provide evidence that teleological processes, broadly speaking, are at play in the domain of personal identity and can influence judgments of identity persistence and authenticity. This is consistent with Kelemen and colleagues’ claim that people indulge in teleological reasoning promiscuously (Kelemen, 1999a, 1999b; Kelemen & Rossett, 2009; Kelemen et al., 2013), across multiple conceptual domains. The current studies represent the first evidence of teleological patterns in reasoning about personal identity, specifically.

This also builds upon the work of Rose et al. (2017), who found similar teleological patterns in judgments about the identity persistence of individual non-person entities. The findings of Study 4B imply that the effect of purpose on identity-related judgments was attenuated in cases of positive change, although the moderating role of change valence was not directly examined. If this is the case, this would be a departure from Rose et al.’s findings, and may imply that there is a more pronounced positivity bias in folk conceptions of personal identity, compared to that of non-persons. However, further research is needed to conclusively assess this possibility.

Implications for Normative Reasoning and Identity. Across the present studies, a basic moral-centering phenomenon (e.g., Strohminger & Nichols, 2014; Goodwin et al., 2014) was replicated in every study where it was possible for it to be observed (i.e., all save Study 2). Moral traits were judged to be more central to identity than non-moral traits (Study 1), and changes in moral character had a greater impact on identity-related judgments than non-moral changes (Studies 3, 4A, and 4B). While largely confirming prior findings regarding this phenomenon, the current studies also extend this literature in at least two ways.
First, the present studies provide some evidence that purpose-based reasoning plays a part in these effects. While not providing conclusive evidence that moral essentialism is completely explained by teleological reasoning, it is clear from the present studies (particularly Studies 4A and 4B) that purpose-based considerations inform both identity-related judgments and moral evaluations, and that the moral vs. non-moral nature of personal changes informs perceptions of purpose-fulfillment. With respect to the phenomenon of people perceiving their own and others’ true selves as morally good by default (Christy et al., 2016; 2017; Newman et al., 2014; 2015; De Freitas et al., 2017a), these new findings imply that people likely also ascribe purposive content to the true self, perhaps even ascribing life purposes directly to the true self. The current findings thus contribute to an emerging picture of the folk conception of the true self as the part of the self that is most attuned to the good and to the purpose(s) of life. This may help explain why “true-self-as-guide” lay theories of decision-making (Schlegel et al., 2013; Kim, Christy, Hicks, & Schlegel, unpublished manuscript), in which the true self is regarded as a reliable “internal compass” that can guide behavior and decision-making, are widely endorsed.

Further extending the literature on normative influences on identity judgments, the comparison between high- and low-warmth moral traits in Study 1 bears on the question of whether it is moral traits per se that are perceived as central to identity, or whether it is more specifically traits with relational relevance that end up being essentialized (Heiphetz et al., 2017). The finding that these two sets of traits were perceived to be essentially equivalent in terms of identity-relevance (as well as morality and purposiveness) suggests that relational relevance (i.e., warmth) does not confer any additional identity-relevance to moral character traits. This suggests that moral-centering effects are broadly moral in nature, rather than specifically relational.
Distinct Identity-related Judgments. The current findings also carry some implications for understanding authenticity and identity-persistence judgments, and how they compare to one another. In general, these two variables were found to be associated with one another and to respond in largely similar ways to the various manipulated factors in the present studies. However, the results of Studies 4A and 4B imply that, relative to identity persistence, authenticity was more sensitive to the valence of the changes in question (although the effect of valence was not tested statistically, this is clear from an examination of Figure 4; the mean levels of authenticity are all considerably higher in Study 4B than any observed in Study 4A). Furthermore, in Study 4B, the authenticity variable remained relatively sensitive to the influences of the change type and purpose factor, whereas these effects were attenuated for the identity-persistence variable. This may reflect the fact that authenticity is a more value-laden construct (cf. Gino et al., 2015) than identity persistence. Authenticity judgments seem to track factors that bear on a person’s overall goodness in a fine-grained way. By contrast, for identity-persistence judgments it seems that the positive valence of a change may be a sufficient condition for inferring that that identity largely persists, but when this condition is met other factors do not make strong additive contributions. Only when changes are negative do identity-persistence judgments vary strongly based on purposive functioning and change type.

Individual- and Kind-Level Identities. The present studies also point to some potentially interesting dynamics between personal identity at the level of individuals and kinds. Broadly, these results suggest that perceptions of kind-level identity and purposes (whether at the level of humans broadly, as in Studies 1 and 3, or at the level of social roles, as in Studies 4A and 4B) inform judgments about individual identity, sometimes very powerfully. This is consistent with other evidence that content that is essentialized at the level of human nature is also seen as
essential to individual personal identity (Park, Haslam, & Kashima, 2012). It is interesting to speculate that, in teleological terms, perceived purposes may exist at multiple levels of identification (i.e., at the individual level, at the level of subordinate kinds like social roles, and at the level of superordinate kinds like humanity as a whole). It may be that this accounts for the stark attenuation of purpose effects in Study 4B, relative to Study 4A. When people undergo positive changes, this may be perceived as a fulfillment of a broad human-kind-level purpose, which is sufficient to result in the person being seen as largely authentic and having a persistent identity, regardless of whether they are fulfilling their purposes at the level of social roles. While this is a fascinating possibility, clearly further work is needed to evaluate this suggestion and to disentangle the dynamics between identities and purposes at these different levels.

Limitations and Future Directions

There are several notable limitations on the conclusions that can be drawn from these studies. Some of these have already been discussed, namely the errors with the manipulation in the original version of Study 2, and the possible non-neutral nature of the control condition in Study 3. Beyond these issues, which cloud the interpretation of those particular studies, some other limitations apply broadly to the entire set of studies. First, all of the current studies relied on samples of North American college students and non-student adults. As such, the teleological patterns documented here may not generalize to other cultural contexts. Although Schachner et al. (2017) have found some evidence of teleological tendencies among Chinese children, it remains to be seen whether teleology in the domain of identity judgments is a cross-culturally robust phenomenon. The present studies also exclusively dealt with perceptions of other people (or with perceptions of traits in the abstract as in Study 1), and thus do not provide any evidence that similar patterns are present in how people understand their own identities. Examining
whether these findings extend to self-perception is an interesting direction for this program of research to take in the future.

Before extending this research into new areas, however, future studies should first seek to replicate the basic patterns observed in the present studies, as well as to clarify some of the more ambiguous findings. Future studies could be conducted that very directly build on each of the current studies. For Study 1, a logical next step would be to repeat the study with a broader taxonomy of trait content, encompassing dimensions other than morality, warmth, and ability (e.g., the various kinds of personal traits considered by Strohminger & Nichols, 2014). For Study 2, as has been discussed, either the manipulation or the dependent measures, or both, could potentially be modified in ways that might yield clearer results. For Study 3, an immediate next step would be to repeat the study with a revised control condition that is truly neutral with respect to the issue of human knowledge-acquisition. If the results proved promising with this update, the basic method of Study 3 could be extended to test whether inducing people to perceive various other ends as the human telos always leads to related traits being perceived as more central to identity.

Finally, Studies 4A and 4B could be extended by examining a broader set of non-moral change types, beyond personality, as well as by considering a wider array of purposes. The four purposive social roles examined in these studies (artist, doctor, mother, and scientist) are all likely roles that people perceive in a generally favorable light, and also may be perceived as a person’s “calling” in life more often than many other roles. In future work using similar methods, it would be interesting to examine whether similar patterns hold for roles that may not be perceived favorably (e.g., torturers, scam artists), for roles that are not perceived as a person’s
“calling” (e.g., janitors, uncles), or for purposes that are not associated with a social role at all (e.g., a person’s lifelong dream of living in Paris).

**Summary and Conclusions**

The current studies offer compelling initial evidence of teleological patterns in reasoning about personal identity, and provide some suggestion that these processes can help explain the phenomenon of moral essentialism in this domain. It seems that how people conceive of personal identity is at least partly organized around perceived purposes or functions (both of human existence broadly, and of the particular individuals in question). Moral content may thus end up at the center of folk conceptions of identity to the extent that people perceive that moral goodness constitutes an end state or aim towards which all people are oriented. These studies have also raised a number of interesting questions to be taken up in future research, and investigating teleology in the folk psychology of personal identity promises to be a fruitful endeavor.
REFERENCES


### Trait items used in Study 1 (taken from Goodwin et al., 2014).

<table>
<thead>
<tr>
<th>High morality, high warmth traits</th>
<th>High warmth, lower morality traits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Humble</td>
<td>1. Warm</td>
</tr>
<tr>
<td>2. Kind</td>
<td>2. Sociable</td>
</tr>
<tr>
<td>3. Forgiving</td>
<td>3. Happy</td>
</tr>
<tr>
<td>5. Helpful</td>
<td>5. Enthusiastic</td>
</tr>
<tr>
<td>7. Empathetic</td>
<td>7. Funny</td>
</tr>
<tr>
<td>8. Cooperative</td>
<td>8. Playful</td>
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<thead>
<tr>
<th>High morality, lower warmth traits</th>
<th>Ability-related traits</th>
</tr>
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<tr>
<td>1. Courageous</td>
<td>1. Athletic</td>
</tr>
<tr>
<td>2. Fair</td>
<td>2. Musical</td>
</tr>
<tr>
<td>3. Principled</td>
<td>3. Creative</td>
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<td>4. Responsible</td>
<td>4. Innovative</td>
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<td>5. Just</td>
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<td>6. Honest</td>
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<td>7. Trustworthy</td>
<td>7. Logical</td>
</tr>
<tr>
<td>8. Loyal</td>
<td>8. Clever</td>
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APPENDIX B.

Example trait rating screen, Study 1.

Target Trait: **Humble**

Please answer the following questions about this trait.

1. How useful would having information about this trait be in telling you how **good or bad** a person is?

2. How useful would having information about this trait be in telling you how **moral or immoral** a person is?

3. A central aim of human life is to develop or acquire this characteristic.

4. Most people share the goal of having this characteristic.

5. Having this characteristic is part of what it means to be a **fully-functioning** person.

6. Part of the purpose of human life is for people to express this characteristic.

7. A person who lacks this characteristic will not be able to reach their full human potential.

8. Having this characteristic is part of what it means to be a **mature** person.

9. This characteristic is a central aspect of a person’s identity; if you have it, it defines who you are.

10. If a person who had this characteristic were to **suddenly lose it**, while remaining the same in all other respects, to what extent would they be a **different person** than they were before?

11. For people who have this characteristic, it makes up a part of their true self.
APPENDIX C

Battery of teleological statements from Kelemen et al., (2013).

Note: Bold text indicates the items that will be presented to participants in Study 2.

1. Bats hunt mosquitoes in order to control over-population.
2. **Bees frequent flowers in order to aid pollination.**
3. Birds transfer seeds in order to help plants germinate.
4. **Mites live on skin in order to eliminate dead skin cells.**
5. **Trees produce oxygen so that animals can breathe.**
6. Ferns grow at ground level in order to conserve humidity.
7. Microbes convert nitrogen in order to enrich the soil.
8. Moss forms around rocks in order to stop soil erosion.
9. **Water exists so that life can survive on Earth.**
10. **Earthworms tunnel underground in order to aerate the soil.**
11. The fittest animals survive so that species can grow stronger.
12. Finches diversified in order to survive.
13. **Germs mutate in order to become drug resistant.**
14. Lemurs have adapted in order to avoid extinction.
15. **Parasites multiply in order to infect a host.**
16. Molecules fuse in order to create matter.
17. Particles collide in order to produce chemical reactions.
18. **Rain falls in order to allow plants to grow.**
19. Sand dunes form in order to stop waves eroding vegetation.
20. The sun makes light so that plants can photosynthesize.
21. **The Earth rotates around the sun so that it can receive light.**
22. Glaciers compact snow in order to conserve volume.
23. **The Earth has an ozone layer in order to protect it from UV light.**
24. Hurricanes circulate seawater in order to gather energy.
25. Lightning releases electricity in order to travel.
26. Mountains fold inwards in order to maintain mass.
27. Oceans dissolve rocks in order to retain ocean minerals.
29. *Volcanoes erupt in order to release underground pressure.
30. *Geysers blow in order to discharge underground heat.
APPENDIX D

Moral decline vignettes, Study 2 (taken from De Freitas et al., 2017).

1. Al used to be a very caring and involved father. In the past, he always showed real affection for his children and always expressed interest in his children’s lives. Now, however, Al is not a very caring father and is not involved in his children’s lives.

2. Amir lives in a culture that does not support terrorism. In the past, Amir did not support the idea of terrorism. However, now, Amir believes that terrorism is an acceptable way to achieve political goals.

3. Bill used to treat his employees well. In the past, he never yelled at them or did anything to publicly embarrass them. Now, however, he often yells at them and publicly embarrasses them for minor infractions.

4. Frank works in an environment that supports only honest business practices. In the past, he has not participated in dishonest business practices. Now, however, Frank believes that it is permissible to engage in dishonest business practices and behaves unethically.

5. Jim used to be a teetotaler. In the past, he never tried a drink of alcohol and never expressed any interest in drinking. Now, however, Jim is an alcoholic.

6. Luke used to be an excellent boyfriend. In the past, he never treated his girlfriend poorly. Now, however, Luke is a “jerk boyfriend” and never treats his girlfriend with the proper amount of respect and affection.

7. Omar lives in a culture that treats all ethnic groups equally. In the past, he also treated ethnic minorities with respect and believed that minorities should have equal rights. Now, however, he mistreats ethnic minorities and does not think that minorities should have equal rights.

8. Tom is a police officer and works in a station that has never supported police corruption. In the past, he never participated in corruption and always behaved ethically. Now, however, Tom engages in corrupt activities and does not conduct himself in an ethical manner.
APPENDIX E

Knowledge-telos and control articles, Study 3.

Knowledge-telos Article

Why Are We Here? To Know Things, Scientists Say

For millennia, people have struggled to understand their place in the universe and wondered about the purpose of human life. One answer that has been suggested by thinkers down through the centuries is that acquiring knowledge and understanding itself is the purpose of human life. Many ancient Greek philosophers held this view, including Socrates, who famously stated, “The unexamined life is not worth living,” and Aristotle, who identified the highest form of human happiness as a life lived in accordance with reason. This take on our purpose as humans has been voiced again and again by thinkers up to the modern day.

Recently, the research findings of psychologists, anthropologists, and evolutionary biologists have started to converge, and the evidence suggests that this view is quite accurate. Art Morris, a psychologist whose work focuses on human motivation, has devoted his career to understanding which of our many motives is the most basic and fundamental. His work suggests that people have an incredibly strong motivation to acquire knowledge, above all else.

“When it comes down to it, people want to know what is going on and how things work,” said Dr. Morris. “In my work, I try to create experimental situations where different motives are pitted against one another, and in these studies the motive to seek information and construct explanations tends to win out over others.” In one study, for example, participants chose between having a 5-minute casual conversation and receiving a 5-minute overview of a historical or scientific topic, thus pitting a social motive against a knowledge motive. “Sure enough,” said Dr. Morris, “Most people opted to seek knowledge.”

Eloise Brownell, a cultural anthropologist, has independently reached much the same conclusion through her archaeological work.

“Virtually all human artifacts are saturated with information and knowledge,” Dr. Brownell said. “This is obvious for things like books and computers, whose explicit purpose is to transmit knowledge, but just about any artifact you can think of carries information.” According to Dr. Brownell, every tool, toy, and trinket also functions to transmit knowledge, if not as directly as books do. “Culture itself is basically an information network, a system for passing knowledge down through successive generations,” says Dr. Brownell, “And every human artifact contains some piece of that knowledge.”

Our very biological nature as humans seems to be geared towards acquiring knowledge and understanding. Katharine Vogel, an evolutionary biologist, describes how many of the traits that distinguished our hominid ancestors from other primates are related to information-processing.

“Even something very basic, like the shift to walking upright, can be seen as a knowledge-enhancing adaptation,” according to Dr. Vogel. “Once our ancestors are standing upright, they start seeing farther, literally taking in more information from their environment.” Other hominid adaptations, notably our larger and more complex brains, have an even more obvious connection to information-processing. “You could say that human beings have evolved
to be knowers,” says Dr. Vogel, “And this has proven to be an incredibly successful evolutionary strategy for our species.”

Taken together, these different lines of inquiry provide compelling evidence that advancing knowledge and understanding is the distinctive aim of human life; there is a very real sense in which this is what humans are for. It seems that there is a strong case to be made that, as the astronomer Carl Sagan stated so elegantly, “We are a way for the cosmos to know itself.”

Control Article

The Simple Science of Bird Banding

PAXUTENT, MD - Scientists at the North American Bird Banding Laboratory have recently begun the Wild Bird Awareness Initiative, an effort to raise public knowledge of and appreciation for the many wild birds native to our continent. As well as educating about the birds themselves, this initiative also aims to make people more familiar with the common research techniques used by ornithologists. Among the simplest of these techniques is bird ringing or bird banding.

Bird banding refers to the practice of attaching small tags to the legs of wild birds for research purposes. By using these tags, scientists can identify individual birds and track them over time. When a bird is first captured, a small numbered tag (typically an aluminum band) with a unique ID number is secured around its leg. Often, the band will also include the original researcher's contact information so that they can be easily updated if the banded bird is re-captured by someone else in the future.

"The main reason we band birds is to make it possible for us to track various measurements over time," says Monica Hirsch, one of the ornithologists leading the initiative. "We take several measurements from a bird each time it is captured - age, size and weight, and location are some of the basic ones, but we can also take more in-depth measurements like the bird's percentage of body fat and the condition of its feathers, and sometimes we even take small samples of blood or tissue."

When a banded bird is re-captured, these measurements are updated and logged in a database with the measurements from previous captures. The North American Bird Banding Program, a joint operation of the U.S. Geological Survey and the Canadian Wildlife Service, coordinates all bird banding activity on the continent. The Program maintians a centralized database, containing measurements taken from millions of individual birds throughout North America. This collection of data allows researchers to observe patterns in the health and behavior of entire populations of birds.

"Some birds have been re-captured as much as 50 years after first being banded," says Dr. Hirsch. "This gives us some idea of their potential lifespan." In research she has conducted with Jordan Bennett, a graduate student in ornithology at the University of Maryland and intern at the Bird Banding Laboratory, Dr. Hirsch has also found that some birds travel over 14,000 miles in the first three months of their lives.

"We are hopeful that the Wild Bird Awareness Initiative will spark more widespread interest in birds, and in ornithology. In the events we've had so far people have been very interested to hear what we have to say, which of course is very encouraging," Dr. Hirsch said. "We see birds everywhere, every day of our lives, and many people are naturally curious about
them. Our hope is that this program will help people better understand birds and how to co-exist with them, and if we're lucky we just might inspire a few future ornithologists."
APPENDIX F

Moral decline and intelligence decline vignettes, Study 3.

Moral Decline
Jimmy has always been a kind and respectful man. Lately though, Jimmy has been changing. Now, Jimmy is much less kind and respectful than he was before, and has been making cruel remarks to his friends, members of his family, and even strangers on the street.

Intelligence Decline
Jason has always been a fairly intelligent man. Lately though, Jason has been changing. Now, Jason is much less intelligent than he was before, and has been having trouble doing things that he used to do with ease, including reading literature and paying his monthly bills.
APPENDIX G

Change vignettes, Study 4A.

Artist Vignette
Vincent is a talented artist. He specializes mainly in drawing and painting, and many of his works are landscapes and other natural scenes. Vincent’s work commands high prices on the art market, and people say that he was born to be a painter. Lately, Vincent has been changing as a person.

Moral Change
Specifically, Vincent has severed all ties with his friends and family, with whom he previously had very good relationships. Now, Vincent deliberately avoids them all, and when by chance he runs into one of his friends or family members he is very cold and unpleasant towards them, making callous remarks and clearly trying to drive them away.

Non-Moral Change
Specifically, Vincent has become very anxious and high-strung, where previously he was quite relaxed and easygoing. Now, Vincent has trouble sleeping at night, and lies awake with his thoughts racing from one worry to another, and during the day he is very nervous and easily startled by unexpected noises.

Purpose Disrupted
Suppose that, after undergoing this change, Vincent’s artistic ability is impaired, and he now produces far fewer drawings and paintings, and the ones he does make are of poorer quality than before he [CHANGED IN GIVEN MANNER].

Purpose Not Disrupted
Suppose that, after undergoing this change, Vincent’s artistic ability is unaffected, and he continues to produce just as many drawings and paintings of the same quality as he did before he [CHANGED IN GIVEN MANNER].

Doctor Vignette
Dr. Jackson is a gifted surgeon. Her specialty is in spinal surgeries, and in many cases Dr. Jackson has saved lives or enabled paralyzed people to walk again. Dr. Jackson is considered one of the top surgeons in the country who performs these operations, and people from around the world travel long distances to seek treatment from her. Lately, Dr. Jackson has been changing as a person.

Moral Change
Specifically, Dr. Jackson has started drinking to excess, using recreational drugs, and having sex with prostitutes regularly after work, all behaviors she did not previously engage in. Now, Dr. Jackson has seemingly dove head-first into this risky, pleasure-seeking lifestyle, and shows no sign of stopping anytime soon.
Non-Moral Change
Specifically, Dr. Jackson has become quite disorganized and untidy, where she was previously very meticulous and organized. Now, Dr. Jackson’s desk in her office is awash with piles of paperwork, her kitchen table at home is littered with dirty dishes and unopened mail, and her personal appearance is often disheveled, with her glasses askew and flyaway strands of hair sticking out in all directions.

Purpose Disrupted
Suppose that, after undergoing this change, Dr. Jackson’s surgical ability is impaired, and her success rate as a spinal surgeon is much lower than it was before she [CHANGED IN GIVEN MANNER].

Purpose Not Disrupted
Suppose that, after undergoing this change, Dr. Jackson’s surgical ability is unaffected, and her success rate as a spinal surgeon is just as high as it was before she [CHANGED IN GIVEN MANNER].

Mother Vignette
Molly is a devoted mother of three young children. She has two daughters, aged 4 and 9 years old, and one son, aged 7 years old. Molly takes excellent care of all three of her kids, and is raising them to be respectful, compassionate, and hardworking people. Lately, Molly has been changing as a person.

Moral Change
Specifically, Molly has stopped engaging in many of the charitable and volunteer activities that she used to do. Where she used to volunteer at the local soup kitchen, assist with town beautification efforts like picking up litter from the roadside, and regularly serve as a chaperone on field trips and other school events, Molly now no longer does any of these things anymore and instead spends her free time idly watching daytime TV.

Non-Moral Change
Specifically, Molly has become quite boring and predictable, where she was formerly very adventurous and spontaneous. Now, Molly follows more or less the same routine every day, cooks more or less the same meals each week, talks to the same group of people about a small number of usual topics, and rarely if ever does anything new or “outside the box,” preferring to stick to what she knows.

Purpose Disrupted
Suppose that, after undergoing this change, Molly’s mothering ability is impaired, and she is no longer able to take care of her children as well as she did before she [CHANGED IN GIVEN MANNER].

Purpose Not Disrupted
Suppose that, after undergoing this change, Molly’s mothering ability is unaffected, and she is able to take care of her children just as well as she did before she [CHANGED IN GIVEN MANNER].

**Scientist Vignette**

Xavier is a brilliant research scientist. He specializes in theoretical physics, studying the subatomic particles that make up the fabric of the universe. The scientific community recognizes Xavier’s work in this area as groundbreaking, and he is a leader in his field. Lately, Xavier has been changing as a person.

**Moral Change**

Specifically, Xavier has started participating in an illegal underground fight club, where he used to be a peaceful and non-aggressive person. Xavier now fights in the club every week, and in his fights he often seriously injures his opponents and has even killed some of them. In spite of this, Xavier really enjoys fighting and plans to continue doing it each week.

**Non-Moral Change**

Specifically, Xavier has become quite shy and timid, where he was formerly very extraverted and outgoing. Now, Xavier lives a socially isolated, almost hermitic existence, preferring to spend time alone at home than to go out dancing, drinking, dining, dating, or any of the other social activities that he used to enjoy taking part in.

**Purpose Disrupted**

Suppose that, after undergoing this change, Xavier’s scientific ability is impaired, and he now has fewer good ideas and less drive to do science than he did before he [CHANGED IN GIVEN MANNER].

**Purpose Not Disrupted**

Suppose that, after undergoing this change, Xavier’s scientific ability is unaffected, and he has just as many good ideas and just as much passion for science as he did before he [CHANGED IN GIVEN MANNER].
APPENDIX H

Change vignettes, Study 4B.

**Artist Vignette**
Vincent is a talented artist. He specializes mainly in drawing and painting, and many of his works are landscapes and other natural scenes. Vincent’s work commands high prices on the art market, and people say that he was born to be a painter. Lately, Vincent has been changing as a person.

*Moral Change*
Specifically, Vincent has made amends with his friends and family, with whom he previously had a strained and distant relationship. Now, Vincent has close and rewarding relationships with many friends and family members, and spends a great deal of his time in their company.

*Non-Moral Change*
Specifically, Vincent has become very relaxed and easygoing, where previously he was quite anxious and high-strung. Now, Vincent doesn’t seem to get stressed out by anything, and even when he gets bad news or is having difficulty with something he takes it in stride and remains calm.

*Purpose Disrupted*
Suppose that, after undergoing this change, Vincent’s artistic ability is impaired, and he now produces far fewer drawings and paintings, and the ones he does make are of poorer quality than before he [CHANGED IN GIVEN MANNER].

*Purpose Not Disrupted*
Suppose that, after undergoing this change, Vincent’s artistic ability is unaffected, and he continues to produce just as many drawings and paintings of the same quality as he did before he [CHANGED IN GIVEN MANNER].

**Doctor Vignette**
Dr. Jackson is a gifted surgeon. Her specialty is in spinal surgeries, and in many cases Dr. Jackson has saved lives or enabled paralyzed people to walk again. Dr. Jackson is considered one of the top surgeons in the country who performs these operations, and people from around the world travel long distances to seek treatment from her. Lately, Dr. Jackson has been changing as a person.

*Moral Change*
Specifically, Dr. Jackson has started living a “clean” life of self-restraint and sobriety, where she formerly was known to drink to excess and use recreational drugs. Now, Dr. Jackson neither drinks nor uses drugs anymore, and instead focuses on finding pleasure and excitement in life itself.
Non-Moral Change
Specifically, Dr. Jackson has become quite meticulous and organized, where she was previously very disorganized and untidy. Now, Dr. Jackson’s desk in her office is spotless, at home her floors are kept vacuumed and everything is put away in its proper place, and her personal appearance is always immaculate.

Purpose Disrupted
Suppose that, after undergoing this change, Dr. Jackson’s surgical ability is impaired, and her success rate as a spinal surgeon is much lower than it was before she [CHANGED IN GIVEN MANNER].

Purpose Not Disrupted
Suppose that, after undergoing this change, Dr. Jackson’s surgical ability is unaffected, and her success rate as a spinal surgeon is just as high as it was before she [CHANGED IN GIVEN MANNER].

Mother Vignette
Molly is a devoted mother of three young children. She has two daughters, aged 4 and 9 years old, and one son, aged 7 years old. Molly takes excellent care of all three of her kids, and is raising them to be respectful, compassionate, and hardworking people. Lately, Molly has been changing as a person.

Moral Change
Specifically, Molly has started engaging in many charitable and volunteer activities. Where she used to spend most of her free time on leisurely activities, Molly now volunteers at the local soup kitchen, assists with town beautification efforts like picking up litter from the roadside, and regularly serves as a chaperone on field trips and other school events.

Non-Moral Change
Specifically, Molly has become quite adventurous and spontaneous, where she was formerly very boring and predictable. Where she used to just stick to what she knew, now Molly is always traveling somewhere new, taking up new hobbies, trying new recipes, meeting new people, or doing something else new and exciting.

Purpose Disrupted
Suppose that, after undergoing this change, Molly’s mothering ability is impaired, and she is no longer able to take care of her children as well as she did before she [CHANGED IN GIVEN MANNER].

Purpose Not Disrupted
Suppose that, after undergoing this change, Molly’s mothering ability is unaffected, and she is able to take care of her children just as well as she did before she [CHANGED IN GIVEN MANNER].
Scientist Vignette
Xavier is a brilliant research scientist. He specializes in theoretical physics, studying the subatomic particles that make up the fabric of the universe. The scientific community recognizes Xavier’s work in this area as groundbreaking, and he is a leader in his field. Lately, Xavier has been changing as a person.

Moral Change
Specifically, Xavier has started participating in activism for peace and nonviolence, where he used to be a fairly violent and aggressive person. Xavier now volunteers his time to advocate for peaceful solutions to problems at all levels, ranging from leading workshops in nonviolent conflict resolution for high school students and convicted criminals, to marching in rallies calling for world peace.

Non-Moral Change
Specifically, Xavier has become quite extraverted and outgoing, where he was formerly very shy and timid. Where Xavier once lived a socially isolated, almost hermitic existence, he now regularly goes out dancing, drinking, dining, and dating. Almost every night of the week, Xavier is participating in some social activity or other.

Purpose Disrupted
Suppose that, after undergoing this change, Xavier’s scientific ability is impaired, and he now has fewer good ideas and less drive to do science than he did before he [CHANGED IN GIVEN MANNER].

Purpose Not Disrupted
Suppose that, after undergoing this change, Xavier’s scientific ability is unaffected, and he has just as many good ideas and just as much passion for science as he did before he [CHANGED IN GIVEN MANNER].